# M14 Rifle History and Development

Text Only Edition

Lee Emerson

**090425**

“Sincere and strong love is greatly gratified and delighted in the prosperity of the beloved object; and if the love be perfect, the greater the prosperity of the beloved is, the more is the lover pleased and delighted; for the prosperity of the beloved is, as it were, the food of love, and therefore the greater that prosperity, the more richly is love feasted.” – Jonathan Edwards, *Heaven, A World of Charity Or Love*, Northampton, England, 1738.

This book is dedicated to those who love and to those who love liberty.

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# Preface

This work is an honest and reasonable attempt at capturing the history and development of the M14 rifle. The reader is encouraged to check the facts for himself. The M14 rifle story is still very much in progress.

Thank you to members of the www.eotacforum.com, www.m-14forum.com, and www.warrifles.com Internet discussion boards for their support and helpful suggestions. Special thanks go to LAW483 Enterprises, Sadlak Industries, Smith Enterprise, SparrowHawk Stocks, Troy Industries, Warbirds Custom Guns, and William J. Ricca Surplus for their generous assistance. The author thanks those who have contributed to this work but wish to remain anonymous. Other Sources # 12, # 18 and # 27 made significant contributions to this volume.

The copy editing chore for the First Edition was freely and graciously donated by Brent A. Blanchard, Attorney and Counselor at Law. Mr. Blanchard learned to shoot from his dad as a child. He shot smallbore rifle as a teenager and was a member of the Brigham Young University Army ROTC Rifle Team. He competed in High Power competition matches in the 1980s while the M14 rifle was king of competition shooting. After he learned that careers in public relations, marketing, and financial planning were not to his liking, Mr. Blanchard went to law school. He was admitted to the bar in the State of Nevada after graduation and later accepted a position at a law firm in Las Vegas, NV.

William Cook Richards generously gave his time to the task of copy editing for the Second Edition. Additionally, his thoughtful suggestions regarding the use of publishing software resulted in a better layout with the Second Edition.

There are no double quotes before and after specific alphanumeric characters used to identify equipment and rifle parts. The substantial number of rifle part identifying marks and dimensional measurements included in the narrow focus of this volume renders those conventions distracting. In this work, “Springfield Armory” refers to the U. S. government installation. The name “Springfield Armory, Inc.” belongs to the commercial firearms manufacturer.

Due to the nature of the Internet, web site addresses listed in the Bibliography were active at the time research was conducted but may not work thereafter. Some rifle models, parts or accessories discussed in this work may not be available due to the limited number made or because the manufacturer is no longer in business.

Always handle all firearms in a safe manner. There are four basic rules of firearms safety: 1) **Treat every gun as if it was loaded** 2) **Never point the muzzle at anything you are not willing to destroy** 3) **Keep your finger off the trigger until the sights are on the target** and 4) **Always be sure of your target and what is behind and to the sides of it**. Metal targets present a ricochet hazard. Ricochets can come back to the firing line from which they originated. Wear proper attire, e.g., no tank tops, and personal protective equipment (ear muffs or plugs and shooting glasses) when shooting.

Always read and follow product safety warnings and instructions. This includes all firearms, ammunition, accessories, and gun care products. Use hand and portable tools safely and in the manner for which they are designed. Consult with law enforcement officials or an attorney if you are unsure of the law where you live.

I trust you will find this work helpful in your pursuit of happiness.

Lee Emerson
April 2009
Las Vegas, NV

# Part 1

# The Military M14

### Introduction

The U.S. Rifle 7.62 mm M14 was adopted for military service by the United States on May 01, 1957. The announcement was made by William H. Brucker, Secretary of the Army. The rifle was officially designated M14 in the U. S. Army Ordnance Technical Committee document OTCM 36558 on June 05, 1957. The M14 rifle was developed to replace four types of military small arms: M1 Rifle, M1 and M2 Carbines, M1918 Browning Automatic Rifle and M3A1 submachine gun. This was an ambitious goal reflecting the long-standing traditions of economy and marksmanship in the U. S. Army. The technology of the time was unable to overcome the laws of nature. The result was a rifle with a heavy hitting cartridge that was tough to manage in automatic fire and too heavy and too long in the minds of its critics and some of its operators. Regardless, the M14 has performed superbly in its primary role, battle rifle.

The M in M14 stands for Model. The M14 rifle is a rotating bolt, gas operated, air cooled, magazine fed, shoulder fired weapon. The M14 is 44.28 " long with the hinged butt plate in the closed position and weighs 8.8 pounds. With a full magazine, cleaning kit and sling, it weighs approximately 11.2 pounds. The maximum effective range is 460 meters (503 yards). The M14 has seen hostile service with the American military from the 1963 Cuban missile crisis to the Global War on Terrorism. The M14 rifle has been employed as a battle rifle, squad automatic weapon, competition match rifle, grenade launcher, sniper weapon system and ceremonial rifle.

Between 1958 and 1963, the U. S. government ordered 1,380,358 M14 rifles from four entities. These were the U. S. Army's Springfield Armory in Springfield, MA; Winchester (Olin Mathieson Chemical Corporation) in New Haven, CT; Harrington & Richardson Arms Company in Worcester, MA; and Thompson-Ramo-Wooldridge, Inc. in Cleveland, OH. A total of 1,376,031 M14 rifles were delivered between 1959 and 1964. In December 1962, just before Secretary of Defense Robert McNamara announced cancellation of the project, the U. S. Army had planned a procurement schedule totaling 2,500,000 M14 rifles by June 30, 1969.

From 1945 to June 30, 1957, the U. S. government spent $10,927,523 to research, develop, test and evaluate the M14. Total cumulative investment cost for the M14 project was $207,017,000. The total cumulative operating, maintenance and ammunition costs up to July 01, 1968 was $295,290,000. The average production cost was $105.15 per rifle with TRW being the most affordable of the four manufacturers. During rifle production, five magazines were packed with each rifle. The cost of the five magazines was $4.20. The production learning curve slope was 92 percent. This means as production quantities doubled, the time to produce each rifle decreased by 8 percent. The production cost per rifle continued to increase for each of the three commercial manufacturers until each had produced 100,000 rifles. After that point, production cost per rifle decreased as more rifles were completed. In 1968, the annual operating (parts, maintenance, and ammunition) cost for each rifle was $50.52. The cost of the M14 project production equipment was as follows: Olin Mathieson Chemical Corporation - $7,593,460, Harrington & Richardson - $6,330,726 and TRW - $6,824,559. The cost of the production equipment at Springfield Armory was not available when researched for a 1968 U. S. Army Materiel Command report.

In October 1968, the U. S. Army Materiel Command reported the following reliability figures for the M14 rifle in Technical Report 68-4 *M14 Rifle Cost Analysis Report*:

Mean Time To Overhaul (average time to overhaul a M14 rifle) - 1.5 hours
Time Between Overhaul (TBO) - 5 years
Mean Time Between Failure (MTBF or average time between any failure requiring repair) - 270 days
Mean Time To Repair (MTTR) - 0.6 hours
Average annual ammunition usage as of November 1965 - 810 cartridges (610 rounds ball, 50 rounds tracer and 150 rounds blank).

**Engineering Material**

There are three important factors which influence the quality of the M14 type rifle receiver and parts. These factors are material selection, heat treatment, and dimensional geometry. Selection of an engineering material is based upon the design, application and manufacturing feasibility of an object. With that in mind, if the proper material is not used, the specified (and desired) values for each mechanical property (hardness, strength, toughness, etc.) may not be achieved for a given part, regardless of whether heat treatment is performed well or done at all. If the incorrect material is used to make the part, the part may yield a shorter service life, or may even catastrophically fail with resulting personal injury or death. The same goes when heat treatment of parts is not performed according to design specifications and procedures. Whether a receiver is initially formed by forging, machining or casting, the finish machining operations are performed before carburizing, quenching and tempering. If dimensional geometry is incorrect, even a properly heat-treated part made of the correct material will either function poorly or it will not last as long as it should.

**Engineering Definitions**

$A_1$ temperature – This is the minimum threshold temperature to create austenite molecular structure in steel. The $A_1$ temperature is 1341 degrees Fahrenheit for steel with less than 6.67 % carbon content. All of the steel used in the M14 rifle contains less than 1.00 % carbon.

$A_3$ temperature – The temperature at which ferrite forms as the steel begins cooling. This is about 1528 degrees Fahrenheit for AISI 8620 steel.

Alloy steel – Alloy steel is steel that contains trace percentages of other elements.

Annealing - This is a method of heat treatment performed by heating steel to a temperature that transforms all of the molecules to austenite structure, followed by slow furnace cooling. This method produces a coarse pearlite molecular structure in the steel. Annealing is done to produce lower strength and higher ductility steel—performance characteristics opposite of high strength and brittleness.

Austenite – Austenite is the Face Centered Cubic molecular structure of iron. The maximum solubility of carbon in austenite is 2.11 %.

Carburizing – Carburizing is a group of techniques for heat treating the surface of steel. It is used when the alloy steel has insufficient carbon to attain the desired surface properties through conventional heating methods. Carburizing alters the chemistry of the surface of the steel. The first part of the process is the diffusion of carbon into the part's surface at an elevated temperature. This creates a high carbon content at the surface which increases the hardness. When the part is then rapidly cooled and tempered the surface remains hard and strong while the core (or center) remains softer and tougher.

Case depth – The depth below the surface of a steel part to which hardening occurs by surface heat treatment techniques.

Cementite – This is a hard and brittle compound of three iron atoms and one carbon atom. It contains 6.67 % carbon. It is used to strengthen steel when it is dispersed evenly. The chemical formula is $Fe_3C$.

Ferrite – Ferrite is the Body Centered Cubic form of iron. The maximum solubility of carbon in (alpha) ferrite is 0.0218 %. Alpha ferrite is one structure of several that can form upon slow cooling from the molten phase.

Hardness – Hardness can be thought of as resistance to permanent indentation. Hardness is measured using various tests with their own number scales, such as Brinell, Knoop, Rockwell, and Vickers.

Heat treatment – Heat treatment is the controlled heating and cooling of metals for the purpose of changing their physical properties. It is one of many methods that can be used to change the mechanical properties of metals.

Hypoeutectoid steel – This is steel with less than 0.77 % carbon content. If hypoeutectoid alloy steel is heated above the $A_1$ temperature, 100 % austenite structure can be formed. This is desired for making hardened steel parts by heat treatment.

Magnetic particle inspection – Magnetic particle inspection is a method of non-destructive examination that detects surface and subsurface flaws in ferromagnetic metals (iron, steel, nickel and cobalt alloys).

Martensite - The Body Centered Tetragonal molecular structure of steel with 0.2 % or greater carbon content. It is the hardest, strongest and most brittle molecular structure of steel. It can be as hard as 65 HRC.

$M_s$ – The temperature at which steel begins to form martensite molecules upon rapid cooling. This temperature differs for each alloy steel.

$M_{90}$ – The temperature at which steel is composed of 90 % martensite upon rapid cooling. This temperature differs for each alloy steel.

Normalizing – This is a method of heat treatment that is performed by heating steel to a temperature that transforms all of the molecules to austenite structure followed by air cooling or oil quenching and tempering. This treatment produces a fine pearlite molecular structure in steel. Normalizing is done to control dispersion-strengthening of the steel.

Pearlite – A form of steel that contains two solid molecular structures of steel, ferrite and cementite. It is created when steel is slowly cooled.

Rockwell hardness test – This hardness tester uses a small diameter steel ball or diamond cone depending on the material to be sampled. The depth of penetration of the ball or cone is automatically measured and converted to a Rockwell hardness number, expressed with “HRC” or “HRD” after the number. HRC means the hardness value on the Rockwell C scale. HRD stands for the hardness value on the Rockwell D scale. The Rockwell C and D scales are used to measure the hardness of high strength steels. A diamond cone indenter is used for these hardness scales.

Stress – Applied force divided by the original material cross-section area.

Surface hardening - Surface hardening is a process which increases the wear resistance of a steel part while it retains its softer and tougher interior. There are three methods for raising surface hardness of steel: 1) diffusion 2) applied energy and 3) surface finish. Carburizing and nitrocarburizing are examples of surface hardening by the diffusion method. Applied energy techniques for hardening steel surfaces include flame hardening and induction hardening. Chromium plating and physical vapor deposition are popular types of surface finishes for steel parts.

Tempering – Tempering is the heating of martensite steel below the $A_1$ or eutectoid temperature. This heating redistributes the cementite within the martensite. Redistribution or dispersion of the cementite is called dispersion-strengthening.

Tempering relieves residual stresses caused by the transformation of austenite into martensite upon rapid cooling. Tempering reduces the strength and hardness but increases the ductility and toughness of steel. However, the hardness is also dependent upon the carbon content of the steel. The higher the carbon content the higher the hardness of the martensite.

Tensile strength – The strength of a material can be determined by measuring the stress it takes to cause deformation. The yield strength is the stress needed to begin permanent deformation (elongation) of a material. The ultimate tensile strength is the maximum applied stress before the material breaks.

Toughness – Mathematically, it is often measured as the total area under the stress versus strain curve for a given material. In layman's terms, toughness is the resistance of a material to failure by impact.

**AISI 4100 and 8600 Series Alloy Steels**

In the United States, types of steel are commonly identified by the American Iron and Steel Institute (AISI) classification system. Carbon and alloy steels are given unique four digit numbers. The first digit of each number indicates the major alloying element or elements. The second digit represents a subgroup of the major alloy element or elements. The third and fourth digits denote the amount of carbon in the steel. For example, AISI 4140 is a molybdenum-chromium alloy steel with 0.40 % carbon content. AISI 4100 and 8600 series alloy and AISI 416 stainless steels are commonly used in the manufacture of M14 rifle parts.

**Table 1: Elements of Alloy Steels**

| Element of Alloy Steel | Advantages and Disadvantages |
|---|---|
| carbon | increases hardness, strength and brittleness |
| chromium | increases hardenability and corrosion and wear resistance |
| iron | principal element of steel |
| manganese | increases hardenability by 1) lowering transformation points and causing those transformations to be sluggish 2) counteracts the brittleness effect from sulfur |
| molybdenum | prevents grain growth resulting in uniformity of hardness and high strength |
| nickel | increases toughness, ductility and corrosion resistance |
| phosphorous | improves strength and machinability but has to be limited to prevent brittleness |

| | |
|---|---|
| silicon | improves hardness and corrosion resistance |
| sulfur | improves machinability but increases brittleness |
| vanadium | increases strength while retaining ductility |

**Table 2: Composition of AISI 8620, AISI 4140 and AISI 416 Steels**

| Element of Composition | AISI 8620 Alloy Steel | AISI 4140 Alloy Steel | AISI 416 Stainless Steel |
|---|---|---|---|
| carbon | 0.18 to 0.23 % | 0.38 to 0.43 % | 0.15 % |
| chromium | 0.4 to 0.6 % | 0.8 to 1.1 % | 13 % |
| iron | major element | major element | major element |
| manganese | 0.7 to 0.9 % | 0.75 to 1.0 % | 1.25 % maximum |
| molybdenum | 0.15 to 0.25 % | 0.15 to 0.25 % | 0.6 % maximum |
| nickel | 0.4 to 0.7 % | | |
| phosphorous | 0.035 % maximum | 0.035 % maximum | 0.06 % maximum |
| silicon | 0.15 to 0.35 % | 0.15 to 0.35 % | 1.0 % maximum |
| sulfur | 0.04 % maximum | 0.04 % | 0.15 % minimum |

**Table 3: Properties of AISI 8620, AISI 4140 and AISI 416 Steels**

| Property | AISI 8620 Alloy Steel | AISI 4140 Alloy Steel | AISI 416 Stainless Steel |
|---|---|---|---|
| density (lb/in$^3$) | 0.283 | 0.28 | 0.28 |
| specific gravity | 7.8 | 7.83 | 7.7 |
| specific heat (BTU/lb/degrees F) | 0.1 | 0.114 | 0.11 |
| melting point (degrees F) | 2600 | 2580 | 2714 |
| thermal conductivity (BTU-in/ft$^2$-h-degrees F) | 180.3 | 159.5 | 172.6 |
| mean coefficient of thermal expansion (x $10^{-6}$ in/in/degree F) | 6.6 | 7 | 5.5 |
| modulus of elasticity in tension (x $10^6$ psi) | 31 | 33 | 29 |

**M14 Rifle Preservation**

Corrosion – In layman's terms, corrosion is the wasting away of a material. This is not desirable but the M14 type rifle must be expected to perform in harsh environments. Thus, corrosion is an issue of concern in its design and application. Corrosion of metal parts can occur from contact from various sources such as chemicals, water immersion, humid air, human body sweat, salt water spray or microbes. Fine grain dust that is high in salts and carbonates, such as that found in Iraq, can corrode metal parts. Alloy aluminum, carbon steel and alloy steel surfaces will oxidize (rust) in moist air but at varying rates. Carbon and low alloy steels have similar poor corrosion resistance in aerated neutral pH water and sea water. Rubber and plastic materials are not immune from corrosion either. Corrosion of rubber and plastic can cause cracking or softening of rifle parts.

Stainless steels have good resistance in mild environments but are susceptible to localized chloride pitting corrosion from sources like salt water or body sweat. This susceptibility to chloride pitting corrosion is at its greatest when stainless steel is heated to a temperature around 195 degrees Fahrenheit, e.g., the M14 gas cylinder after firing. Martensitic stainless steels are used to manufacture some M14 type rifle parts. Martensitic stainless steels have the least corrosion resistance of the five types of stainless steels. In sea water or in water near neutral pH, martensitic AISI 416 stainless steel will suffer general surface corrosion at a faster rate than carbon steel or low alloy steel. Martensitic stainless steels are also susceptible to hydrogen embrittlement cracking corrosion but this is not an issue when in service as a M14 type rifle part.

Preservation – Carbon and alloy steels can be preserved with coating or plating. Most M14 type rifle parts are made from alloy steels. Alloy steel parts are almost always coated with manganese phosphate or zinc phosphate for corrosion protection. Both methods of phosphate coating have been in use for decades.

Thomas Coslett developed and patented iron phosphate coating in 1907. Six years later, Frank Richards of the United Kingdom patented the process of manganese phosphate coating. In 1915, Clark Parker obtained the rights to both patents and formed the Parker Rust-Proof Phosphating Company of America. Zinc phosphate coating was developed by the Parker Rust Proof Company as an inexpensive alternative to manganese phosphate coating. The U. S. Patent for the zinc phosphate coating method was issued in 1942 to Van M. Darsey, an employee of the Parker Rust Proof Company.

Phosphate coatings can and do wear off of M14 rifle parts from normal use and handling. Many gunsmiths are equipped to refresh or replace the phosphate coating on parts with a worn finish. The color of phosphate coating on USGI M14 parts varies from light gray to green-gray to charcoal gray. Manganese phosphate produces darker shades of gray color finish. Zinc phosphate coats the parts with lighter shades of gray. M14 parts were phosphate coated in batches and by many companies for the U. S. government. As an example, the finish on the butt plate assembly was allowed to vary among shades from gray (FED-STD-595 color 36118) to black (FED-STD-595 color 37038). Consequently, the M14 enthusiast should not expect new-in-wrap or used USGI M14 parts to match in color when assembling a M14 type rifle.

The USGI rack grade barrel bore, gas piston, spindle valve, gas cylinder plug, operating rod front end, gas cylinder bore and commercial stainless steel barrels are not phosphate coated. The bolt roller was not coated at the factory but left bare. Some bolt rollers on stripped bolts were phosphate coated during arsenal or depot inspection, recoating and rewrap. Some alloy steel barrels are blued, such as the commercial barrels and the early 1980s military barrels made by Gene Barnett. Gun bluing and phosphate coatings will not adhere to stainless steel. Consequently, USGI M14 gas cylinders, spindle valves and gas cylinder plugs were blackened with molten sodium dichromate oxide coating. Commercial reproduction gas cylinders are protected with paint that will adhere to stainless steel. Alternately, the gas cylinder, spindle valve, front band and gas cylinder plug exterior surfaces can be preserved with a ceramic coating as is done by Jeffrey Shapiro (NY) as part of his National Match modification.

The M14 rack grade barrel bore is chromium plated for corrosion protection among other benefits. The process of chromium plating a rifle barrel was patented in 1932 by John M. Olin and Alfons G. Schuricht. John M. Olin was a chemical engineer at Western Cartridge Company when he and Mr. Schuricht developed the plating process. The two gentlemen developed the process as a means to minimize corrosion and erosion in gun barrels caused by the use of ammunition. Mr. Olin went on to become President of Olin Industries in 1944. In 1954, he was elected Chairman of the Board at the newly formed Olin Mathieson Chemical Corporation. Mr. Olin retired in 1957. He was awarded, solely or jointly, twenty-four patents for items related to firearms and ammunition. He passed away in 1982. Between 1953 and 2005, the John M. Olin Foundation distributed more than $370,000,000 to politically conservative academic institutions.

Parts such as scope mounts and gas cylinder lock wrenches made from alloy aluminum are typically anodized to prevent oxidation. All of these metal surface finishes serve to preserve M14 type rifle parts and accessories from the harmful effects of corrosion.

Wood Stock Preservation - Linseed oil, tung oil and a number of commercial wood finishes have been used with great success to bring out the natural beauty of M14 rifle stocks. Well-preserved wood M14 stocks command a collector premium.

There are four categories of surface finishes for preservation of wood gun stocks: 1) raw or pure oils 2) boiled oils 3) polymerized or bodied oils and 4) varnishes. When applied to a wood surface, these liquids harden into a solid film to form a protective seal. Oil and varnish finishes are susceptible to deterioration from mildew and fungus and generally do not offer ultraviolet light protection.

The first three categories, pure, boiled and polymerized oils, are known as drying oil finishes. Drying oils cure over time by forming a network of long chain molecules (polymerization) while reacting to the presence of oxygen (oxidation). Drying oils offer good, affordable moisture resistance and are easy to apply. Drying oil finishes soak into the wood thereby enhancing the natural appearance of the grain.

Raw or pure oils are obtained from plants. Raw oils that have been used at one time or another include linseed, tung, walnut, poppy seed, perilla and walnut oil. Raw oils take weeks to fully cure when applied to wood. All environmental factors and the applied oil film thicknesses being equal, tung oil will dry faster than linseed oil because it absorbs less oxygen. Among raw oils, linseed and tung oils are the universal choices for gun stock preservation. Linseed oil is an extract of the seed of the flax plant (*Linum usitatissimum*). Tung oil is made from tung tree nuts (*Aleurites fordii*). Tung oil is also known as chinawood oil. With age, linseed oil will turn yellow and may flake on a wood surface but tung oil is very resistant to yellowing and will not flake.

Until 1942, the U. S. Army used raw linseed oil to preserve wood gun stocks. From M1 rifle production in 1942 until at least 1963 when the last M14 rifles were assembled with wood stocks, tung oil was the preservative used in the factory. Tung oil gives a more durable finish than linseed oil. For maintenance purposes, raw linseed oil was the preservative specified in U. S. Army M14 rifle technical manuals. The M14A1 stock drawing specifies boiled linseed oil or tung oil as the protective finish. U. S. Army manual FM 23-8 cautions against getting linseed oil on the metal parts. The reason for this is that a sticky gum can form on the metal parts from dried linseed oil.

Long curing time for wood finishes is not always desireable. Boiled oils have additives known as siccatives. A siccative is an oil soluble organic acid metal salt. Adding siccatives to raw drying oil reduces the cure time from weeks to less than two days. The presence of drying additives, siccatives, is what classifies it as boiled oil. Siccatives may contribute to yellowing of an oil finish but do not affect the water moisture content of the wood. Boiled linseed oil is a popular choice among civilian collectors. It gives the wood stock a military appearance without the long cure time.

There are two common polymerized or bodied oils, linseed and tung. Bodied oils are made by heating raw oil sufficiently in an oxygen-free atmosphere to complete polymerization. Thus, oil viscosity, or resistance to flow, of the polymerized or bodied oil is significantly increased. Bodied oil then only has to react with oxygen to fully cure. This results in a much faster cure time and a more durable film as compared to the raw oil. Bodied oils generally "set" after a day. Polymerized tung oil produces a smooth gloss appearance as compared to the matte finish of pure tung oil.

A varnish is typically a combination of drying oil, resin and a solvent. A varnish will form a hard surface on the wood stock as the solvent evaporates. Turpentine and turpentine substitutes, e.g., mineral spirits, are used as varnish solvents. Varnishes are sold in glossy, semi-gloss or satin finish. Varnishes have little or no color. There are several types of varnishes: acrylic, alkyd, drying oil, epoxy, lacquer, marine, polyurethane, resin, shellac, and violin. Polymerized linseed oil varnish is commonly sold as Danish oil. Varnishes dry faster and harder than drying oils and provide excellent water resistance but often lack aesthetic appeal. Some varnishes have additives for ultraviolet light protection.

Normal Climate Care – FM 23-8 (May 1965 edition) specified a daily inspection of the M14 rifle to check for any corrosion when in use. For preservation, the same manual requires a light film of lubricating oil to be applied on all metal parts except the inside of the gas cylinder, the gas piston and the gas cylinder plug. Alternately, USGI rifle bore cleaner could be applied to metal surfaces as a short term (one day) protectant. Note: **The barrel bore and chamber should be cleaned, dried and checked clear of obstructions before firing.** Lubricant or bore cleaner left in the barrel can affect rifle accuracy. More significantly, foreign material may adversely increase chamber pressure. Above freezing, corrosion becomes a problem if not properly addressed by the rifle owner.

Cold Climate Care - For temperatures below freezing, all moisture and excess lubricant must be removed to keep the rifle working properly. In extensive arctic testing in the winter of 1968, the U. S. Army found the M14 malfunctioned 137 times out of 30,000 rounds fired (0.5 %) using five unlubricated rifles in ambient temperature ranging from 35 degrees Fahrenheit to - 58 degrees Fahrenheit. Among this set of five rifles, the most common malfunction was the failure of the bolt to lock open (44 of 137 instances). When LSA lubricant (then MIL-L-46000A) was used in the same test, the malfunction rate dropped to 23 malfunctions in 30,000 rounds fired (0.07 %) with another set of five M14 rifles. Each rifle was field stripped and cleaned every 1000 rounds during the test. LSA lubricant is no longer available in the military supply system.

The U. S. Navy prescribes a light coat of the synthetic blend, Cleaner Lubricant Preservative (CLP), in subzero temperature. The Mk 14 Mod 0 operator manual states CLP will provide adequate lubrication between 0 and - 35 degrees Fahrenheit in areas where grease is normally applied with the exception of the bolt roller. Regardless, it is best to keep the rifle outside in the cold air in such conditions. Without risking loss of life or limb, cover the rifle with cover (poncho, blanket, tarp, etc.) to protect it from snow or ice. If the rifle is brought into a heated space, do not clean it until the rifle has reached room temperature at which time it can be thoroughly cleaned of all moisture.

Hot and Humid or Ocean Climate Care – Wipe metal surfaces dry and lightly coat with CLP or other preservative oil. This maintenance will help protect the rifle from the effects of perspiration or saltwater. If the rifle is submerged in saltwater, clean all metal surfaces with fresh water as soon as possible before drying and lubricating. Frequently apply raw or boiled linseed oil to the wood stock to keep it from swelling.

Desert Climate Care – Clean the rifle daily or more often to keep sand and dust from accumulating in the bore and on the moving parts. Keep the rifle dry and the muzzle and receiver covered when dust or sand is in the air. It is better to keep the rifle dry of soft lubricants in sandy areas. If not, oil or grease will collect dust and sand. The debris-laden lubricant then becomes abrasive when the rifle is employed. The U. S. Army has determined that moving vehicles in the desert, and firearms stowed inside them, are dust traps. This lesson also has application for ranchers and outdoorsmen who stow firearms in their vehicles. In sandy, dusty areas, the M14 rifle should be periodically wiped down with a clean soft cloth to keep down the dust build up. The M14 wood stock should be hand rubbed with raw or boiled linseed oil to keep it from drying out.

Muddy Area Climate Care - Clean, thoroughly dry and then lubricate the rifle as soon as possible.

**M14 Rifle Lubrication**

A comprehensive discourse of tribology is beyond the scope of this work. The reader is referred to U. S. Army manual EM 1110-2-1424 *Lubricants and Hydraulic Fluids* for an excellent introduction to the subject. The following information is intended to familiarize the reader with the topic of lubrication for the M14 type rifle. The M14 rifle needs lubrication under normal climate conditions to operate as designed while minimizing wear of the parts in sliding contact. The engineering materials used as lubricants in the M14 rifle can be divided into two categories, soft and hard.

Soft Lubricants – Oils, greases and sprays are used to lubricate moving parts within a firearm to facilitate proper function and minimize parts wear. Soft lubricants also provide modest protection against corrosion where applied. They are economical and readily available. Most soft lubricants do not perform well in cold weather. Soft lubricants break down over time with use of the rifle and due to exposure to air and moisture. Greases do not dissipate heat well and small quantities are not easily dispensed. As a rule of thumb, more is not better for soft lubricants. The minimum amount of lubricant should be applied to the M14 rifle in its care.

Some ingredients and properties of grease are defined as follows:

Anti-wear (AW) additive - Solid lubricant particles are dispersed in grease to prevent metal-to-metal contact of lubricated surfaces. These solid particles are known as anti-wear additives. Phosphorous and zinc compounds and suspended polytetrafluoroethylene (PTFE) are common AW additives. Anti-wear additives are useful up to about 465 to 480 degrees Fahrenheit. Above that temperature range, anti-wear compounds begin to break down. Anti-wear additives will reduce the oxidation resistance of grease. Consequently, grease containing anti-wear additives will need to be reapplied much more often than grease without AW or oxidation inhibitor additives.

Apparent viscosity - Viscosity is the resistance of a fluid to flow. Oil has a consistent viscosity for a given temperature. The viscosity of grease decreases as the shear rate (speed of metal surfaces sliding against each other) increases. Thus, the apparent viscosity of a grease is its resistance to flow for a given shear rate at a given temperature.

Bleeding - Bleeding is the separation of the lubricant from the thickening agent in a grease.

Boiling point - The boiling point is the temperature at which the grease will begin to vaporize at atmospheric pressure.

Consistency - Consistency is the hardness of grease. It is a primary factor in selecting suitable grease for a given application, e.g., lubrication of the M14 rifle.

Corrosion inhibitor - A corrosion inhibitor protects the lubricated metal surfaces from corrosion attack by moisture or other foreign contaminants.

Dropping Point - The dropping point is the temperature at which a grease will drop from a standard test orifice.

Evaporation - Evaporation is the loss of the lubricant component of grease as it is heated.

Extreme pressure (EP) additive - An EP additive in grease prevents seizing of the sliding metal surfaces under very high pressure. Graphite and molybdenum disulfide are common EP additives and may be used for service above 600 degrees Fahrenheit.

Flash point - The vapor from the grease may ignite from an open flame above this temperature.

NLGI (National Lubricating Grease Institute) Number - The NLGI number is a comparative scale number to indicate the hardness of grease as tested at 77 degrees Fahrenheit. The higher the NLGI number, the harder the grease. NLGI number 000 is the lowest rating (semi-fluid) and 6 is the highest (solid). The NLGI number for military specification rifle grease is equivalent to 2.5.

Oxidation inhibitor - An oxidation inhibitor is an additive that minimizes oxygen attack of the grease. Oxygen attack, or oxidation, will increase apparent viscosity. An oxidation inhibitor, or anti-oxidant, will extend the useful life of a soft lubricant. Oxidation inhibitors are consumed over time as the grease is exposed to the open air. Oxidation of grease also increases as its temperature increases. The higher the service temperature the sooner the grease will need replacement.

Penetration - Penetration is a test for measuring the hardness or consistency of grease.

Pour point - The pour point is lowest temperature at which a grease or oil will flow under standardized test conditions.

Shear rate - The shear rate is the relative rate of sliding between molecules of the grease as it flows.

Water resistance - Water resistance is the ability of grease to lubricate the surface to which it is applied in the presence of water.

Most firearms lubricants available today are petroleum based oils and greases. As of 2007, over 98 % of lubricating oils and greases were made with petroleum (mineral) oil. Lithium complex grease containing mineral oil is generally considered true multipurpose grease. Due to its versatility, lithium-based grease accounted for 72 % of the commercial market in 2007. Lithium-based greases have been available since 1942.

Military instructions on how to use oil and grease to lubricate the M14 varied slightly depending on the document:

Springfield Armory Report SA-NM11-2612 (June 1955) - A light coat of oil should be applied to all metal surfaces except the bore, chamber and other parts that contact ammunition. Extra care should be taken to lubricate specified areas of the receiver, bolt, operating rod, and operating rod spring. After firing and cleaning, the interior of the gas system (gas piston, gas cylinder and gas cylinder plug) was to be left lightly oiled.

FM 23-8 (December 1959, May 1965 and April 1974) - Lubricate the rifle with PL Special lubricating oil in normal temperatures and Lubricating Oil, Weapons (LAW) in subzero temperatures. A light film of oil should be applied to all metal surfaces except for surfaces coming in contact with ammunition and the interior of the gas cylinder, gas piston and gas cylinder plug. Rifle grease was to be applied to specified areas of the receiver, bolt and operating rod. If the rifle was to be exposed to very cold temperature or sand or dust, grease was not applied.

MIL-G-46003 (August 1961) and MIL-G-46003A (December 1976) - Rifle grease was designed to lubricate rifles and other small arms in conditions of sustained rain within the temperature range of 35 to 100 degrees Fahrenheit.

TM 9-1005-223-10 (March 1972) - Lubricate the rifle with PL Special lubricating oil in normal temperatures or LAW in subzero temperatures. Apply rifle grease to specified areas of the receiver, bolt and operating rod.

Military Specification MIL-G-46003A lists the performance requirements for rifle grease:

Material - a mixture of mineral or synthetic oil and a thickening agent that may or may not have additives but able to meet the requirements of MIL-G-46003A

Work penetration - The consistency of the grease must be 220 to 270 per ASTM D217.

Dropping point - The grease must possess a dropping point of at least 190 degrees Fahrenheit per ASTM D566.

Mineral oil viscosity - The viscosity must be 108 to 172.6 centiStokes at 100 degrees Fahrenheit per ASTM D445.

Water resistance - Not more than 4 % per ASTM D1264

Rust prevention - A rating of 2 or less per ASTM D1743

Corrosion resistance - No evidence of green color, pitting or etching and no black or brown stain after the test strip is washed with normal hexane per FED-STD-791 method 5309.

Storage stability - The grease is able to meet the specified requirements after sealed storage at 100 degrees Fahrenheit for six months.

Performance test - Grease stored for six months is applied to five M14 rifles for testing. Each rifle is fired in a series of semi-automatic and automatic cycles for a total of 500 rounds. During the entire test, the rifle is subjected to water spray. If there is more than one freeze up of a bolt or more than six malfunctions due to operation of the bolt amongst the entire 2,500 rounds shot, the lot of grease is rejected.

Workmanship - The rifle grease must have smooth texture and free of abrasives, lumps, granular particles, entrapped air and any odor.

Aside from military specification rifle grease, there are a number of commercially formulated greases that provide adequate lubrication for the M14 type rifle in all but the most severe service conditions.

As a general rule, different greases should not be mixed together or applied one over another. If a new type of grease is to be used, the M14 type rifle should first be disassembled and thoroughly cleaned of all grease. Combining greases may result in a mixture that is too hard or too soft or the maximum useful temperature may be lowered too far or the enhanced performance of the additives may be diminished. As an example, a grease manufacturer, Henkel KGaA, notes on its specification sheet that Plastilube will lose its heat resistance if mixed with a grease containing a soap thickening agent.

SAE 10 engine oil or automatic transmission fluid can be used in a combat or other life threatening situation to lubricate a M14 rifle. Automobile engine oil *may* have corrosion inhibitor and anti-wear additives and/or *may* contain benzene. Some automobile engine oils do, some do not. Automobile engine oil should be used as a last-ditch option for lubricating the M14. A better choice for a field expedient lubricant is automatic transmission fluid. Automatic transmission fluid does contain corrosion and oxidation inhibitors and does not break down until about 220 degrees Fahrenheit.

Grease is an emulsion of a fluid lubricant and a thickening agent. It may have additives for enhanced performance. *Typically*, the fluid lubricant is oil and the thickener is soap. The oil can be made from petroleum or a vegetable or a man-made synthetic composition. Aluminum-, calcium-, lithium- and sodium-based soaps are common thickening agents in greases. Complex grease will have a second thickening agent. The second thickener is added to increase the useful service temperature of the grease. All three parts, lubricant, thickener and additives, influence the properties and performance of grease. The lubricant portion of the grease can be from 50 % to 95 % by weight. The thickening agent(s) are generally 5 % to 20 % of the grease recipe and additives can be 0 % to 15 % of the composition by weight. Cost and the intended application (customer or end user requirements or specifications) for a grease influence what ingredients and how much of each make up a manufacturer's "recipe."

The M14 rifle, like other firearms, is usually subject to short periods of use bracketed by long periods of inactivity. The M14 rifle has sliding contact of parts under an applied force, e.g., bolt-to-receiver, operating rod-to-receiver, hammer-to-bolt, etc. Lubricating oil will run or migrate from where it is needed with time so it is not well-suited for the M14. If a grease with too hard a consistency is applied to sliding surfaces, it may not flow to parts surfaces where needed during operation. The ideal M14 lubricant will be a multipurpose grease instead of oil.

The ideal M14 rifle grease should have: 1) the consistency of paste 2) good or better temperature resistance with minimal bleeding 2) good or better water resistance and 3) contain anti-wear, corrosion and oxidation inhibitors. Such properties are desireable because the M14 rifle is likely to perform in intemperate weather. Military specification MIL-PRF-63460 prohibits the use of graphite as an ingredient for Cleaner, Lubricant and Preservative. Since CLP is authorized for use in the Mk 14 Mod 0, and other military weapons subject to combat use, lubricant with graphite additive is not recommended.

Operating temperature has a significant effect on the performance of grease. As the operating temperature decreases, the apparent viscosity of grease increases to the point that it can cause the M14 to malfunction in its operating cycle. Generally, the low temperature operating limit for grease is its pour point. As operating temperature increases, softening and then bleeding will occur. As the temperature is further increased the lubricant in the grease will evaporate. The higher the operating temperature of the lubricated surface, the more frequent the grease will need to be reapplied. At even higher temperatures, the thickening agent and any additives will boil and break down chemically forming harmful solid deposits and off-gases. An industry rule of thumb is the service life of grease is halved for every 59 degrees Fahrenheit over 158 degrees Fahrenheit.

Over the years, Lubriplate and Plastilube grease have been issued to U. S. military troops for lubrication of the M14 rifle. Both greases serve well as lubricants for the M14 type rifle. Both contain mineral oil but the major difference is in the thickening agent. Lubriplate 130-A uses calcium-based soap and Plastilube is made with an inorganic clay thickener. The trademark, LUBRIPLATE, was registered to the Lubriplate Corporation (New York, NY) on October 06, 1931. The name LUBRIPLATE was later registered by Fiske Brothers Refining Co. (Newark, NJ) on October 19, 1948. The trademark registration has since expired. Lubriplate 130-A grease was developed for the M1 Garand rifle during World War II. It is pale yellow in color. Lubriplate 130-A is water resistant and contains anti-wear, oxidation, and corrosion additives. Lubriplate 130-A has a kinematic viscosity of 135 centiStokes at 104 degrees Fahrenheit. Greases with a base oil viscosity over 100 centiStokes at 104 degrees Fahrenheit are classified as high viscosity greases. The viscosity of the base lubricant is designed to meet the intended application. The sliding surfaces in the M14 rifle are not heavily loaded but do move at a fast *cyclic rate* of 750 times per minute. A high viscosity grease approximating the kinematic viscosity of Lubriplate 130-A and with consistency of children's paste, is then appropriate for the M14.

Plastilube grease was developed in January 1950 by Warren Refining & Chemical Company Corporation (Cleveland, OH). The name, PLASTILUBE, was registered to Warren Refining & Chemical on February 20, 1951. The trademark registration has expired. Plastilube is reddish-brown in color. It is thicker in consistency than Lubriplate.

The Military Qualified Products List for military specification rifle grease was last updated on March 02, 1992. The sole entry on the latest list is Lubriplate RG-62-A (equivalent to Lubriplate 130-A) made by Fiske Brothers Refining Company.

U. S. Army FM 23-8 (May 1965 edition) specified the application of rifle grease to a number of surfaces on the rifle before firing: bolt locking recesses, the bolt camming lug on the hammer, operating rod camming surfaces, and the lip of the receiver that contacts the rear top edge of the bolt. As part of normal maintenance, M14 gunsmiths may also recommend a light film of rifle grease in: 1) the operating rod channel 2) the operating rod saddle that contacts the barrel 3) the bolt roller 4) the receiver bolt raceway 5) between the top of the lip of the front band and the bottom of the stock ferrule 6) the inside of the cylindrical portion of the operating rod 7) the inside diameter of the operating rod guide 8) the operating rod spring guide 9) the bottom of the rear sight base and 10) sides of the rear sight aperture. U. S. Army armorers applied MIL-G-10924 specification grease to M14 NM rifles. The official name of this grease is "Grease, automotive and artillery" and is commonly referred to as "GAA."

**Table 4: Suppliers of USGI Rifle Grease**

| Supplier and Original CAGE Code | Product Name and Type | Year Manufactured |
|---|---|---|
| BG & O Co. (Kansas City, MO) | Plastilube - mineral oil with bentonite clay and additives | 1963 |
| Fiske Brothers Refining Co. (Newark, NJ and Toledo, OH)<br>CAGE Code = 73219 for NJ and 9N579 for OH | Lubriplate 130-A or RG-62-A - mineral oil with calcium soap and additives | 1969, 1985, 1999 |
| International Lubricant Corp. (New Orleans, LA)<br>CAGE Code = 74898 | DGSC-SSH (1992) - mineral oil with thickening agent and additives | 1963, 1992 |
| International Supply Corp. (Richmond, VA)<br>CAGE Code = 6A908 | Lubriplate RG-62-A - mineral oil with calcium soap and additives | 1996 |
| Parr, Inc. Warren Refining Division (Cleveland, OH)<br>CAGE Code = 02307 | Plastilube - mineral oil with bentonite clay and additives | 1971 |
| Southwest Grease & Oil Co., Inc. (Wichita, KS) | | 1965 |
| Witco Chemical Corp. Southwest Petro-Chem Division (Olathe, KS)<br>CAGE Code = 3V856 | SA 824 1027 - mineral oil with barium soap and additives | 1990 |

The U. S. Navy cleaning regimen for the Mk 14 Mod 0 rifle is as follows:

Every 250 rounds - clean the bore and chamber
Every 500 rounds - clean the gas piston and gas cylinder
Every 1000 rounds - 1) clean the rifle including the bolt, operating rod and connector 2) apply rifle grease to bolt lugs, receiver bolt raceways and recesses, bolt roller, receiver operating rod channel and operating rod camming surfaces and 3) clean and preserve other metal parts.

Grease should be removed and reapplied yearly to prevent solidification. Grease stored in containers deteriorates over a long period of time. The lubricant will typically separate from the thickener. In this condition, the grease may or may not still meet its design specifications. Tests for penetration, dropping point and oil separation are needed to determine if the grease is still usable.

Cleaner, Lubricant, Preservative - The all-purpose weapons liquid Cleaner, Lubricant and Preservative (CLP) was adopted by the U. S. Department of Defense some time before July 1979 with promulgation of military specification MIL-L-63460. CLP replaced several different small and large caliber weapons cleaners, lubricants and preservatives in the U. S. military supply system. Where allowed by the operations and maintenance manual, e.g., Mk 14 Mod 0, CLP is authorized for use in lieu of rifle bore cleaner (MIL-PRF-372), medium preservative and lubricating oil (MIl-PRF-3150), low temperature weapons lubricant (MIL-PRF-14107), automatic weapons lubricant (MIL-L-46000) and rifle grease (MIL-G-46003). For normal climate care, CLP is the specified lubricant for the M14 DMR and the Mk 14 Mod 0 per the operator level manuals published by the U. S. Marine Corps and U. S. Navy.

Because MIL-L-63460 (now MIL-PRF-63460) was a performance specification and not a required list of recipe ingredients, the CLP formula composition was left to the USGI contractor to develop. CLP does tend to dry out after about one month after application on the rifle. If the particular brand of CLP has PTFE additive, the container should be shaken immediately prior to application as the PTFE tends to settle within minutes inside its container. Additionally, CLP with PTFE additive left in the bore will cause erratic accuracy for as many as twenty shots out of the rifle until blown out of the muzzle.

As of early 2007, military approved vendors and associated product designations for CLP included Sentinel Canada (SENT-CLP and CLP 22), Anderol, Inc. (ROYCO-634), Arpol Petroleum Co. (ARPOLUBE 63460), Shell International (Aeroshell Fluid 634), and LHB Industries (Pro CLP). In the commercial market, the CLP formula made by Royal Lubricants (marketed by Remington Arms) does not contain PTFE additive. The CLP liquid supplied by Armor Holdings contains PTFE additive.

Operating Temperature - The U. S. military has tested the M14 and M16 type rifles to determine the temperatures at which various parts are subject to during heavy use. Cookoff is a condition where ammunition is heated sufficiently from its surrounding environment to explode. Automatic rifles and machine guns are susceptible to this condition during heavy use. If the weapon is air cooled, has a thin contour barrel and is fired from a closed bolt, e.g., M14, the rate of fire needed for cookoff is substantially lowered. The rate of cooling of the M14 barrel limits its sustained rate of fire. The ambient temperature, length and contour of the barrel, the styles of hand guard and stock, and the attachment of a sound suppressor all affect the rate at which the barrel cools off. As the M14 rifle is fired, the temperature along the barrel will vary substantially. The chamber area will heat up the least. The barrel forward of the chamber up to the gas port will be the hottest section. As some of the gas flows into the gas cylinder, the barrel muzzle will not be quite as hot. Regardless, the temperature in each portion of the barrel will increase with the number of rounds and/or the rate of fire.

Most lubricants and cleaners left inside the bore will boil off as the barrel heats up before cookoff occurs. Each lubricant or cleaner will have its own boiling point. The commercial and military firearms lubricants researched all had boiling points in excess of 400 degrees Fahrenheit. For general comparison, butter in a heated frying pan will smoke at about 395 degrees Fahrenheit. The bore should be swabbed clean and dry before firing to avoid loss of accuracy or any ill effects to the operator. Sliding surfaces of the M14 rifle will be less than 400 degrees Fahrenheit. Thus, firearms lubricants applied to sliding surfaces of the M14 should not boil off.

While not an evaluation of the M14, the following summary illustrates the approximate range of temperatures extant in a centerfire rifle barrel at cookoff. The U. S. Army conducted substantial testing of the M16A1 and M16A1E1 (later adopted as the M16A2) in 1982. Part of this testing included a thorough evaluation of the barrel temperatures under cookoff and sustained firing conditions. The profile of the M16A2 barrel approximates that of the M14 standard contour barrel. Thus it serves to illustrate the effects of sustained firing conditions in the M14 rifle barrel.

In the cookoff test, the U. S. Army determined that the M16A1 could be fired at a rate of 85 rounds per minute for 150 rounds without cookoff. The maximum barrel temperature measured was 849 degrees Fahrenheit at a point 12.9 " from the breech end. Likewise, the M16A1E1 was able to fire 170 rounds per minute at the same rate without experiencing cookoff. The maximum barrel temperature for the M16A1E1 was 903 degrees Fahrenheit at a point 12.8 " from the breech face. In the testing of the two rifles, the lowest recorded temperatures at which cookoff occurred was 847 degrees Fahrenheit on the barrel surface at 12.9 " from the breech end and 338 degrees Fahrenheit on the chamber, both on the M16A1E1. Cookoff occurred at much higher chamber and mid-barrel surface temperatures in the sustained rate of fire test. It occurred at 564 degrees Fahrenheit and above at the chamber and 1,018 degrees Fahrenheit and above in the middle portion of the barrel. Cookoff occurred as soon as fifteen minutes of firing at 30 rounds per minute in the thinner barrel M16A1.

During development of the Mk 14 Mod 0, the Naval Surface Warfare Center (Crane, IN) found that cookoff could occur in as little as 150 rounds of continuous semi-automatic fire with a wood stock M14 on a hot sunny day. The Naval Surface Warfare Center (NSWC), in later testing, obtained the following temperature readings on a Mk 14 rifle fitted with a Smith Enterprise, Inc. M14DC sound suppressor and a third generation Sage International, Ltd. M14 EBR stock:

Mk 14 rifle fired in semi-automatic mode for 160 rounds at a rate of one per second then allowed to cool -

Chamber temperature - 178 degrees Fahrenheit
Gas cylinder temperature - 496 degrees Fahrenheit
Sound suppressor temperature - 734 degrees Fahrenheit
Cookoff - no cookoff after ten minutes

Mk 14 rifle fired in automatic mode for 200 rounds in twenty round bursts -

Chamber temperature - 250 degrees Fahrenheit
Gas cylinder temperature - 525 degrees Fahrenheit
Sound suppressor temperature - 1107 degrees Fahrenheit
Cookoff - cookoff occurred at sixty seconds

PTFE Additive in Firearms Lubricants under High Temperature - The following is not meant to be a comprehensive discussion on polytetrafluoroethylene (PTFE), its use and its limitations. However, the use of PTFE as an additive for firearms lubricants is a matter of some curiosity. It is beyond the scope of this work to fully address this topic but some information is presented here as the basis for further inquiry on the part of the reader.

PTFE was discovered on April 06, 1938 by Dr. Roy J. Plunkett, a chemist at the Jackson Laboratory of E. I. du Pont de Nemours and Company, Inc. while working on a new air conditioning refrigerant. Kinetic Chemicals, Inc. (DuPont) patented PTFE in 1941. DuPont is the sole supplier of PTFE in the United States.

At room temperature, PTFE is a white wax-like substance. PTFE has very low friction resistance, excellent dielectric strength and high heat resistance. The first PTFE resin coated cooking pan was created in 1954 by Marc Gregoire (France). PTFE resin is a common coating for non-stick cookware. PTFE is used as an insulator in electrical cables, an ingredient in printed circuit boards and as a stain repellent on fabrics.

Due to its very low coefficient of friction, PTFE is used for applications where sliding action of parts is needed such as bearings, bushings, gears, slide plates and firearms. For these applications, PTFE particles are mixed with mineral oil as an anti-wear additive.

PTFE is chemically inert below 464 degrees Fahrenheit. If left unattended on a hot stove burner, PTFE resin cookware can reach temperatures high enough to release toxic byproducts into the immediate atmosphere. These toxic byproducts can be lethal to birds and can cause temporary flu-like symptoms in human beings. In a 1973 study of PTFE resin coated cookware, pet birds were found to die from the toxic fumes of PTFE when the PTFE resin coated cookware reached 536 degrees Fahrenheit. Such a temperature exceeds what is needed for cooking food and is an obvious abuse of the cookware.

As PTFE is heated above food cooking temperature, it begins to emit ultra fine particulate matter at 464 degrees Fahrenheit. It melts at 621 degrees Fahrenheit. Further heating of PTFE to extreme temperatures, which should not be done, results in the release of several toxic gases:

At 680 degrees Fahrenheit - difluoroacetic acid (DFA), hexafluoropropene (HFP), monofluoroacetic acid (MFA), perfluorooctanoic acid (PFOA), tetrafluoroethylene (TFE) and trifluoroacetic acid (TFA)
At 878 degrees Fahrenheit - silicon tetrafluoride ($SiF_4$)
At 887 degrees Fahrenheit - perfluoroisobutene (PFIB)
At 932 degrees Fahrenheit - carbonyl fluoride ($CFO_2$) and hydrofluoric acid (HF)
At 1112 degrees Fahrenheit - octafluorocyclobutane (OFCB), perfluorobutane (PFB) and trifluoroacetic acid fluoride ($CF_3COF$)
At 1202 degrees Fahrenheit - carbon tetrafluoride ($CF_4$)

Firearms cleaner, lubricant or preservative oil or grease containing PTFE additive applied to sliding surfaces of the M14 rifle will not reach a temperature of 464 degrees Fahrenheit or higher with the possible exception of the cylindrical portion of the operating rod and the operating rod guide. Thus, firearms cleaner, lubricant or preservative with PTFE additive will remain chemically inert when applied to the saddle portion of the operating rod and areas to the rear. Application of any cleaner, lubricant or preservative oil or grease containing PTFE additive forward of the chamber may result in deterioration of the PTFE additive.

Experience of the U. S. Marine Corps found that when CLP containing PTFE additive was left in the bore of a M14 rifle it would shoot erratically until the CLP had been blown out after the first fifteen to twenty rounds of fire. The accuracy would return indicating the washing out of the CLP with its PTFE additive. Even with automatic fire, it’s unlikely any portion of the barrel surface would reach 464 degrees Fahrenheit or higher in no more than twenty rounds. If the M14 rifle was fitted with a sound suppressor, the propellant gases and any residual bore cleaner or preservative will blow back into the shooter’s face each time the rifle is fired. If the bore cleaner or preservative contained PTFE additive then it is conceivable that some PTFE high temperature particulate or off-gas could be blown on to the shooter.

An Aberdeen Proving Ground experiment in 1987 found that propellant gas temperature, as measured 5.2 " past the end of the M14 rifle flash suppressor exceeded 2000 degrees Fahrenheit in the first millisecond after bullet exit from the rifle. The temperature excursion was found to be very short-lived as the gas temperature dropped to less than 500 degrees Fahrenheit in less than 2 milliseconds after the bullet exited the flash suppressor. The APG study used ammunition loaded with WC-846 gunpowder.

**Table 5: Select Properties of Some Military Greases**

| Property | MIL-G-46003-A Lubriplate 130-A | MIL-G-46003 Plastilube | MIL-PRF-10924-G Grease, Automotive and Artillery NATO Code G-403 |
|---|---|---|---|
| NLGI Number | 2.5 | 2 | 2 |
| Type | mineral oil with calcium soap and additives | mineral oil with bentonite clay and additives | ingredients are the perogative of the contractor |
| Service Temperature (degrees Fahrenheit) | 20 to 170 | - 49 to + 356 | up to 320 minimum |
| Dropping Point (degrees Fahrenheit) | 200 | none | 428 |
| Flash Point (degrees Fahrenheit) | 400 | non-flammable | 470 |
| Boiling Point (degrees Fahrenheit) | > 550 | > 428 | 700 |

For civilian use, what cleaner, lubricant or preservative should be used for the M14 type rifle? No one product will perform all three functions in a superior manner. The M14 owner should choose a different product for each need.

Cleaner - Commercial brand bore cleaner that is suitable for removing gunpowder residue and copper fouling.

Lubricant - Commercial NLGI # 2 grease made of mineral oil, a calcium complex or lithium complex soap, and additives. Both types of thickeners possess good to excellent water resistance. Sodium-based greases have poor water resistance. Grease containing synthetic oil serves just as well as those with mineral oil as a firearms lubricant but typically at additional retail cost.

For NLGI # 2 greases, lithium-based soap grease will remain fluid to a point between - 20 and 0 degrees Fahrenheit depending on the formulation. In comparison, a calcium-based soap grease with a NLGI # 2 rating is typically useable to a temperature between 0 and + 10 degrees Fahrenheit depending on its recipe. Generally, lithium complex grease can be used up to 350 degrees Fahrenheit while its dropping point exceeds 500 degrees Fahrenheit. Calcium-based greases are usually more affordable than lithium-based greases.

The following list is a few of the more common grease additives and their uses:

Antimony dialkyldithiocarbamate - antioxidant, anti-scuff, anti-wear, corrosion inhibitor, extreme pressure additive, friction reducer
Methylene-bis-dibutyldithiocarbamate - antioxidant and anti-wear
Potassium triborate - antioxidant and anti-wear
Zinc dialkyldithiocarbamate - anti-wear, corrosion inhibitor, and oxidation inhibitor
Zinc dialkyldithiophosphate - anti-wear, corrosion inhibitor
Zinc oxide - corrosion inhibitor

The civilian M14 type rifle owner will not likely need the high temperature or extreme pressure protection afforded by solid anti-wear additives such as graphite, molybdenum disulfide or PTFE.  Grease with a service temperature up to 350 degrees Fahrenheit should suffice for civilian use.

Preservative - Commercial brand of Cleaner, Lubricant and Preservative (CLP) without PTFE additive due to the possible release of off-gases from elevated barrel temperature

The reader is referred to the applicable military specification for a complete listing of performance requirements for the greases and oils listed in the following tables.

**Table 6: Select Properties of Some Military Lubricating Oils**

| Property | MIL-L-46000-C Lubricant, Semi-fluid (Automatic Weapons) NATO Code O-158 | MIL-PRF-14107-D Lubricating Oil, Weapons, Low Temperature NATO Code O-157 | MIL-PRF-63460-E Cleaner, Lubricant and Preservative NATO Code S-578 |
|---|---|---|---|
| Kinematic Viscosity | 10.0 centiStokes minimum at 104 degrees F | 5.8 centiStokes minimum at 100 degrees F | 14.0 centiStokes minimum at 104 degrees F |
| Type | synthetic lubricant in a lithium based thickener | ingredients are the perogative of the contractor | ingredients are the perogative of the contractor |
| Service Temperature (degrees F) | - 65 to + 260 | - 70 to 0 | - 60 to + 160 |
| Pour Point (degrees F) | none specified | - 75 maximum | - 74 |

| Property | MIL-L-46000-C Lubricant, Semi-fluid (Automatic Weapons) NATO Code O-158 | MIL-PRF-14107-D Lubricating Oil, Weapons, Low Temperature NATO Code O-157 | MIL-PRF-63460-E Cleaner, Lubricant and Preservative NATO Code S-578 |
|---|---|---|---|
| Flash Point (degrees F) | none specified | 305 minimum | 149 |

Each chemical product on the market should have a Material Safety Data Sheet (MSDS) available. If the MSDS cannot be found through an online search, the manufacturer or distributor should be contacted to obtain one. The MSDS is very helpful because it will give the reader the product physical data, any handling precautions to be aware of and it will usually disclose some, if not all, of the product ingredients. Undoubtedly, the amount and type of ingredients in a firearms care product will vary from manufacturer to manufacturer for a similar product.

Disclaimer: The user of any firearms care product is responsible for following all manufacturer instructions and precautions. Follow all product instructions and warnings on the container. Some products should be used in well ventilated areas and/or may require skin protection. Never use these products in a manner other than what is intended by the product manufacturer.

Hard Lubricants – It may seem detrimental for very hard surfaces to be in bare sliding contact with each other but friction and wear can be significantly reduced with some hard surface finishes. In other words, a solid material can be a lubricant. In the M14 rifle, this is not only possible but has already been achieved. The benefit of applying a hard smooth finish to the M14 barrel bore was realized in 1956. The all chromium plated firing pin has proven itself enduring and lubricious since the mid-1960s. The XM25, M25, M14SE and Mk 14 SEI rifles employ gas pistons with very hard finishes in combat conditions. Some commercial M14 type receivers and parts have been nitrocarburized since 1985. As part of a custom rifle project, Century Arms International imported Norinco M14 Sporter receiver serial number C08610 has been dense chromium plated. Unique in the history of Springfield Armory, Inc., all metal parts for M1A serial number 020000 were completely chromium plated and then assembled together with a wood laminate stock. M1A serial number 020000 left the Geneseo, Illinois factory in this condition. Proper selection and application of hard, smooth finishes does enhance the service life of M14 rifle parts.

Ceramic coatings have been applied to metal cutting tools for decades. Titanium carbide coated cutting tools were introduced to the industry in 1969 and titanium nitride coated gear cutters were first used in 1980. Ceramic coatings are used on metal cutting tools because they are abrasion resistant, very hard, and chemically inert and have a low coefficient of friction. The benefits are longer tool life, higher cutting speed, higher feed rate and less machine tool down time. Ceramic coatings are also used to coat steel molds in plastic injection molding machines. The ceramic coating provides improved wear resistance for the mold. One such ceramic coating is titanium nitride.

Titanium nitride is applied to clean metal parts by the physical vapor deposition method. Briefly, this process entails evaporating a very thin layer of titanium on to the part inside a nitrogen gas chamber. The titanium nitride layer is typically 0.0001 " to 0.0002 " thick. This process is done at a temperature low enough (400 to 900 degrees Fahrenheit) so that the metallurgy of the part being coated is not affected. Depending on the ingredient composition, the color of titanium nitride coatings can be any of several hues of brown or gold.

Titanium nitride coated gas pistons became part of the build specification for XM25 rifles by 1988. The M14 SE Semi-automatic Sniper System is built with a dense chromium plated gas piston. The USGI M14 gas piston material specification is heat treated AISI 420 stainless steel. Typical USGI gas piston surface hardness ranges between 74.5 and 77 HRA (approximately 42 HRC). A gas piston coated with titanium nitride results in a surface hardness ranging from 80 to 85 HRC. Thin dense chromium plated gas pistons have a surface hardness ranging from 70 to 78 HRC. The advantages of a hard and smooth finish gas piston are as follows:

1) Anti-galling and anti-seizing properties – Galling is the welding of two metals together as they slide against each other. Galling and seizing are not desirable in the M14 rifle gas system. Titanium nitride and dense chromium coatings are harder but have lower coefficients of friction than stainless steel. These characteristics result in a slicker surface than the bare stainless steel gas piston. In effect, the hard finish is a solid lubricant in this application. Consequently, there is less gunpowder and primer residue buildup. Gunpowder and primer residue buildup does cause a very minute amount of seizing between the gas cylinder and gas piston.

2) Corrosion protection – Titanium nitride and thin dense chromium finishes have better pitting corrosion resistance than martensitic stainless steel.

3) Thermal protection – Thin layers of titanium nitride and dense chromium give the substrate metal, AISI 420 stainless steel in this case, better resistance to the effects of heat. The higher resistance to heat extends the service life of the gas piston much like titanium nitride coated metal cutting tools last longer than those that are not coated.

4) Better compression – The hard finish extends the life of the piston grooves. A sharper groove edge will provide compression for a longer amount of time plus it removes more of the gunpowder and primer residue from the cylinder wall than a bare gas piston.

5) Easier cleaning – Cleaning the piston is made easier since the gunpowder and primer residue does not adhere as well as it would on bare gas pistons.

Nitrocarburizing is a thermochemical process that improves the surface properties of iron or steel parts. It increases surface hardness to 60 HRC, reduces the coefficient of friction, improves wear resistance and enhances corrosion resistance of the metal treated. M14 type receivers, gas cylinders, gas cylinder locks, gas cylinder plugs, front bands, hammers, triggers and scope mounts have received the benefits of nitrocarburizing treatment.

Nitrocarburizing produces two or three very thin layers of structurally altered steel by diffusing nitrogen and carbon into, not on, the surface of the steel part. Depending on the material composition and the treatment time, the depth of each layer will vary. Total depth of the nitrogen and carbon layers is normally 0.008 " to 0.040 ". The higher the alloy content of the part, the thinner the total depth of the nitrocarburizing layers for the same treatment time. A layer of epsilon iron nitride (6 to 9 % nitrogen and 1 % carbon) is created in the surface to a depth of less than 0.001 ". The epsilon iron nitride layer improves wear and corrosion resistance and lowers the coefficient of friction. A deeper layer of nitrogen under the epsilon iron nitride is produced among the steel molecules. This layer of nitrogen improves fatigue strength of the part. Depending on the treatment selected, a third very thin layer of passive $Fe_3O_4$ oxide is formed on the epsilon iron nitride layer for improved corrosion resistance. Application of this passive oxide layer is not suitable for stainless steel.

The passive $Fe_3O_4$ oxide layer enhances the corrosion resistance of the substrate metal, which is AISI 8620 alloy steel for the M14 type receiver. Burlington Engineering, Inc. (Orange, CA) performed a salt spray test (DIN 50 021 SS procedure) to compare the corrosion resistance of various surface finishes. The base metal was a medium carbon steel, AISI 1045. The number of hours until the first spot of oxidation was observed was as follows: 1) untreated AISI 1045 steel – 8 hours 2) hard chromium plating – 70 hours 3) double chromium plating – 100 hours 4) nickel plating – 120 hours 5) nitrocarburized AISI 1045 steel – 380 hours.

The static coefficients of friction for various materials obtained from several sources are listed for the benefit of the reader. Values for kinetic coefficients of friction are usually significantly lower. The lower the value for coefficient of friction the less resistance there is to sliding contact on the material.

**Table 7: Coefficient of Static Friction for Select Materials**

| Material(s) | Coefficient of Static Friction |
|---|---|
| clean aluminum on aluminum | 1.35 |
| clean iron on iron | 1 |
| clean steel on steel | 0.6 to 0.8 |
| clean titanium nitride on steel | 0.4 to 65 |
| clean chromium on chromium | 0.41 |
| clean nitrocarburized steel | 0.16 to 0.33 |
| ice on ice | 0.1 |
| thinly greased steel on steel | 0.05 to 0.20 |
| polytetrafluoroethylene on steel | 0.04 |
| SAE 30 oil lubricated nitrocarburized steel | 0.03 to 0.12 |
| human shoulder, elbow, wrist and finger joints | 0.01 |

**M14 Receiver Material**

Military and commercial M14 type receivers are made of AISI 8620 or equivalent low carbon molybdenum-chromium alloy steel for the most part. However, there were some exceptions. At least twenty receivers were made of stainless steel by Armscorp USA in the late 1990s. These were identified by the letter S preceding the serial number. At least some of these receivers experienced premature wear of the elevation serrations. Poly Technologies M14S receiver serial numbers 000001 through 000005 were made of AISI 4140 alloy steel and hardened to 60 HRC. Other commercial receivers have been made of the same material but hardened to only 45 to 49 HRC. These receivers also exhibited accelerated wear of the elevation serrations.

The material requirement has always been AISI 8620H alloy steel for USGI M14 receivers. However, there were unintentional exceptions. At least ten Harrington & Richardson M14 receivers were made from AISI 1330 carbon steel and yet another Harrington & Richardson M14 receiver was made of high nickel alloy steel.

The M14 receiver (and bolt) should possess a hard and strong surface but ductile and tough core. The surface hardness and strength provides outstanding wear and fatigue resistance while the soft core gives excellent resistance to failure from impact. It is a hypoeutectoid steel. It is not age-hardenable. That is, it not will increase in strength below 500 degrees Fahrenheit over time. AISI 8620 alloy steel can be hardened and strengthened at the surface and made softer at the core by properly heat treating the surface. It is free machining steel which means it forms small chips when cut. AISI 8620 alloy steel is the choice of material for the M14 receiver and bolt.

Theory of AISI 8620 Steel Heat Treatment – The goal is to produce a part, e.g., M14 receiver, with a hard and strong surface and a ductile and tough core. AISI 8620 is a low carbon alloy steel. There is not sufficient carbon content to raise the surface hardness to what is desired (52 to 60 HRC) by simply heating the exterior. The part made from AISI 8620 steel can be made as hard and strong as AISI 4140 steel surface heating by carburizing. The part is placed in a carbon rich medium and then heated above the $A_3$ temperature. High carbon content (0.8 to 1.0 %) is created to a shallow depth from the surface by the diffusion of carbon into the austenite molecules present. The part is then quenched and tempered. The result is a hard, strong, and uniform depth martensite surface depth but the softer core is a mixture of martensite and free ferrite. The thickness of the martensite layer, the case depth, is much less than a steel heat treated by surface heating such as is done with medium carbon alloy steels like AISI 4140. The result is that the softer core has a larger and consistent volume than it would have by surface heating. Thus, the carburized receiver has greater toughness. This is the chief advantage of AISI 8620 steel as the material of choice for the lightweight and reliable automatic M14 rifle receiver.

USGI M14 receivers were required to meet these hardness requirements until August 1961: surface hardness of 61 to 69 HRD (47 to 58 HRC), core hardness of 31 to 42 HRC, and a case depth of 0.012 " to 0.018 ". Due to the testing as a result of the December 1960 receiver and bolt failures, the receiver drawing hardness requirements were changed in August 1961 to 61 to 71 HRD (47 to 60 HRC) for surface hardness, 28 to 42 HRC for core hardness and the case depth remained the same, 0.012 " to 0.018 ".

During testing in 1961 at Springfield Armory and Winchester, it was found that Harrington & Richardson, Springfield Armory and Winchester receivers did not always comply with the drawing hardness requirements. These receivers measured out-of-specification low for core hardness in the barrel ring: 1) Harrington & Richardson serial numbers 50925, 73345, 76335, 76716, 76940, 77655, 78556, 79258, 79972 2) Springfield Armory serial numbers 107548, 11314 and 3) Winchester serial numbers 31962, 34300, 34870, 35474, 35563, 35847, 35973, 36187, 36324. Each receiver was tested in five or more spots for core hardness after cutting the barrel ring radially. All of the measurements taken were less than 28 HRC.

USGI M14 receivers that measured out-of-specification high for core hardness in the barrel ring were Winchester serial numbers 28305, 28308, 28259 and 28293. All of the readings (six readings per receiver barrel ring) in the barrel ring were greater than 42 HRC. Other USGI M14 receivers measured out-of-specification low for core hardness in the receiver lug area were Harrington & Richardson serial numbers 275109, 368915, 369006. All of the readings in the receiver lug area (two readings per receiver) measured less than 28 HRC.

Chinese and U. S. commercial M14 receivers are not always heat treated to the same procedure as was done for USGI M14 receivers. In 2005, a mid-1980s manufacture U. S. commercial receiver was tested and found to be 60 HRC at the surface and 45 HRC at the core. The core hardness was higher than allowed by the USGI M14 receiver drawing F7790189. The commercial receiver hardness was brought back into USGI specification by annealing the receiver. The surface hardness of a few Chinese receivers imported into the United States has tested substantially less than USGI drawing specification. Such receivers can be brought to suitable surface and core hardness through proper heat treatment.

Assessment of AISI 9310 Alloy Steel - A 1961 Watertown Arsenal Laboratories study on the applicability of AISI 8620H steel for M14 receivers and bolts found that its heat treatment procedure required very strict control in order to meet the specified surface and core hardness requirements. As a follow up to the 1961 study, Watertown Arsenal Laboratories evaluated the hardness suitability of AISI 9310 for M14 receivers and bolts.

AISI 9310 is a nickel-chromium-molybdenum low carbon high alloy steel. The elemental composition of AISI 9310 steel obtained from Springfield Armory and tested by Watertown Arsenal Laboratories was as follows:

Carbon - 0.11 %
Manganese - 0.60 %
Silicon - 0.32 %
Nickel - 3.21 %
Chromium - 1.24 %
Molybdenum - 0.11 %
Phosphorous - 0.010 %
Sulphur - 0.009 %

The AISI 9310 steel was tested for hardenability and impact and its molecular structure examined under microscope. It was carburized at 1600 degrees Fahrenheit for 100 minutes, quenched in agitated oil at 150 degrees Fahrenheit then tempered for 60 minutes at 400 degrees Fahrenheit. This heat treatment resulted in a case depth of 0.014 ", a surface hardness of 56 HRC and core hardness of 39.5 HRC. The core had a 100 % martensite structure. The case was 75 % austenite and 25 % martensite. The high amount of austenite in the outer surface of the case reduced the surface hardness to a depth of about 0.005 ". The lower surface hardness could result in accelerated wear or fatigue of the M14 receiver or bolt. The solution was to subject the AISI 9310 steel to cooling at - 100 degrees Fahrenheit for two hours. The cooling treatment decreased the austentite concentration to less than 10 % and increased the surface hardness to 62 to 65 HRC.

The impact resistance of AISI 9310 steel was compared to that of AISI 8620H steel at - 40 degrees Fahrenheit. In Charpy V-notch impact testing, the AISI 9310 steel was able to absorb much more energy than 8620H steel. For example, when both steels were carburized then quenched at 400 degrees Fahrenheit in agitated oil, AISI 9310 steel absorbed 21.5 ft-lbf of energy while the AISI 8620H steel absorbed 3.4 ft-lbf of energy.

AISI 8620H steel contains a higher amount of sulphur which should make it easier to machine than AISI 9310 steel. However, the 1962 Watertown Arsenal study was optimistic regarding AISI 9310 alloy steel. Based on limited experience with machining both steels and the complex geometry of the M14 receiver and bolt, the Watertown Arsenal report surmised that AISI 9310 steel would be the easier of the two materials to machine.

The Watertown Arsenal Laboratories assessment of AISI 9310 concluded: 1) the core toughness of AISI 9310 was superior to that of AISI 8620H steel when both were carburized and heat treated 2) uniform case and core hardness could be obtained with AISI 9310 steel over a wide range of tempering temperature 3) the high austenite structure of carburized and heat treated AISI 9310 steel could be changed into martensite by a period of deep freezing and 4) the Charpy V-notch impact test was a valid test for small carburized steel parts requiring high toughness.

**AISI 8620 Alloy Steel**

The following is presented as background information on AISI 8620 alloy steel. It is a low carbon nickel-chromium-molybdenum alloy steel. The description is as follows:

Typical Uses – AISI 8620 alloy steel is the most widely used carburizing alloy. It is used for gears, shafts and other applications where high wear resistance and a tough core are desirable.

Features – It is noted for a good combination of fatigue and wear resistance, hardness, strength and toughness when properly heat treated and carburized.

Shear Strength – Ultimate shear strength is about 70 % of ultimate tensile strength.

Machinability – The machinability rating is 68 % of AISI 1112 in the annealed condition. It is machined prior to carburizing so that the case depth is not reduced. It polishes well. Average surface cutting speed is 110 feet per minute.

Forming – Forming is good in the annealed condition.

Normalizing – This alloy is typically heated to 1675 degrees F for sufficient time to ensure thorough heating then it is allowed to air cool.

Hardening – This alloy can be hardened by 1) normalizing by heating to 1500 F then water quenching then tempering or 2) annealing then cold working.

Carburizing – Carburizing is typically accomplished by heating to 1650 to 1700 degrees F in a carburizing medium then quenching the steel in oil.

Annealing – Anneal by heating to 1550 degrees F followed by furnace cooling at no more than 50 degrees F per hour down to 850 degrees F. Below 850 degrees F, it can be air cooled.

Forging – Forging is done from 2200 degrees to 1750 degrees F.

Tempering – The steel is heated at temperatures ranges from 400 to 1200 degrees F depending on the hardness wanted. The lower the tempering temperature the higher the hardness and tensile strength.

**How was the U. S. Government Issue (USGI) M14 receiver made?**

1. A slug of AISI 8620 steel is cut off from 1 3/4 " diameter bar stock.

2. The steel slug is heated to forging temperature using automatic instrumentation. The temperature range for forging AISI 8620 steel is 1750 to 2200 degrees Fahrenheit.

3. The steel slug is placed into the impression-die forging press and formed. The raw forging is created.

4. The hot receiver forging is removed by hand and held while trimmed by machine.

5. The raw forging is then heat treated. It is normalized by heating 130 to 140 degrees Fahrenheit above the $A_1$ temperature. This ensures the core exceeds the $A_1$ temperature. This causes the molecular structure of the steel to change from ferrite and cementite to 100 % austenite. The raw forging is then air cooled or oil quenched and tempered at not less than 450 degrees Fahrenheit. Normalizing produces a fine pearlite structure with a minimal amount of free ferrite. The raw forging is normalized instead of annealed because it is faster and extreme softness is not needed for the receiver. Normalizing also produces greater strength and toughness than annealing. The forgings are checked to be within a specified hardness range before machining. This helps minimize tool wear.

6. The receiver goes through broaching operations. Broaching is a simple and rapid means of removing metal. Typical tolerances that are obtained by broaching are + or - 0.0005 " to 0.0010 ". Broaching is usually more accurate and leaves a better finish than reaming or milling.

7. The receiver is machined to produce the final shape. The rifle model, manufacturer and serial number is then stamped on the receiver heel.

8. After all machining operations, the receiver is carburized, quenched and tempered. The receiver is placed in a carbon rich environment and heated to 1550 to 1600 degrees Fahrenheit. It is left in this condition long enough to obtain a case depth of 0.012 " to 0.018 ". For comparison, the thickness of Boise Cascade 20 pound bond copier paper is 0.0035 " (catalog number OX9001). The carbon surrounding the receiver diffuses into the austenite structure surface. After a specified time, the receiver is immediately quenched in oil. The receiver temperature is reduced to well below the $M_{90}$ temperature, 650 degrees Fahrenheit, in less than two seconds. This produces a minimum of 90 % martensite structure throughout the receiver. However, martensite lacks the toughness and ductility desired for the M14 receiver. So, the receiver is tempered at 350 to 450 degrees Fahrenheit for at least one hour. The martensite in the core decomposes gradually to a softer mixture of ferrite and cementite as temperature and time are increased. This change in the core increases the ductility and toughness of the core. The procedure is controlled to limit the free ferrite to 10 % of the core composition. By specifying and adhering to the temper temperature range and time restrictions, the amount of free ferrite is controlled. The resulting hardness and strength is achieved within the desired values.

9. The receiver is air gauged for compliance to blueprint dimensional tolerances. At Springfield Armory, non-compliant receivers were stamped with the letter S and discarded as scrap.

10. The receiver is inspected for defects by magnetic particle inspection.

11. The receiver is phosphate coated.

12. The receiver and other M14 parts are assembled together.

**Receiver Heat Treatment**

The heat treatment procedure for the M14 receiver as of the last drawing revision is as follows:

1. Recommended Heat Treatment - Normalize before machining (oil quenching followed by tempering at not less than 450 degrees Fahrenheit may be used in lieu of air cooling). Carburize at 1550 to 1600 degrees Fahrenheit to specified case depth. Oil quench from 1550 to 1600 degrees Fahrenheit. Temper to hardness specified.

2. Mandatory Requirements:

a. Normalize before machining.
b. Carburize to case depth 0.012 " to 0.018 ".
c. Temper one hour minimum at 350 to 450 degrees Fahrenheit.
d. Core hardness 28 to 42 HRC. Surface hardness 61 to 71 HRD.
e. Microstructure of core shall not contain more than 10 % free ferrite after heat

treatment.
f. The use of a straight cyanide bath or gas processes shall not be permitted.

3. Inspection after Heat Treatment - After heat treatment each receiver shall be free from cracks, seams and other injurious defects as determined by magnetic particle inspection using a standard five turn magnetizing coil with a current of 400 to 500 Amperes.

The USGI specification for M14 receiver surface hardness is 48 to 60 HRC (61 to 71 HRD). A receiver core hardness of 35 HRC is the optimum value. In 1961, Springfield Armory tested forty-seven of its M14 receivers to see if a mathematical relationship could be established between the surface hardness of the barrel ring and core hardness in the receiver lugs. The receiver serial numbers tested ranged between 107548 and 119853. An additional 123 Springfield Armory M14 receivers were subsequently tested to verify the preliminary findings of the first forty-seven receivers. Using the empirically derived formula, the core hardness of 168 of 170 receivers was able to be predicted within + or - 3 HRC. The Springfield Armory formula was

$$\text{Core hardness} = 2\,(\text{barrel ring surface HRC} + k - \text{barrel ring surface HRD})$$

where factor k was dependent on the area of the receiver cross-section being examined and the quench rate of the heat lot. Note: This formula is presented for educational purposes only. Do not use this formula to predict the core hardness in a commercial manufacture M14 type receiver.

The USGI M14 receiver was required to meet 139 quality assurance specifications. All M14 receivers were examined by magnetic particle inspection. The government drawing required the receiver to be marked with the letter M if no injurious defects were found. Otherwise, a percentage (0.65 % to 2.5 %) of receivers in a given production lot were examined for dozens of dimensional requirements, proper markings, and acceptable surface roughness. Three sample receivers were examined from each day's production for proper core hardness and case hardness depth. Sample receivers were also tested for proper surface hardness. Additionally, five sample receivers from each lot were subjected to a salt spray test. Failure of any one sample tested for adequate protective finish, surface hardness, case hardness depth or core hardness resulted in rejection of the entire lot.

The terms, part number and drawing number, are used interchangeably when discussing USGI M14 (and other small arms) parts. For the most part, these two terms are synonymous. The exception to this rule was when a drawing was made for an assembly, e.g., drawing number C7790187 for the M14 bolt assembly. In the strict sense, the drawing number is preceded by the drawing sheet size, A being the smallest and F the largest. Example, the flash suppressor drawing number is F7791053.

**Development of Magnetic Particle Inspection**

According to an American Society of Nondestructive Testing Level III certified individual who audits U. S. DOD aerospace parts contractors for compliance with government specifications, the procedure for magnetic particle inspection has changed since the late 1950s. Regarding the M14 receiver blueprint, he states [minor spelling errors corrected]:

The listed procedure would only detect flaws oriented in the transverse direction of the receiver. On a forged or billet receiver, it would only detect flaws perpendicular to the grain flow of the metal. Most often, flaws will run in the direction of grain flow, not perpendicular to it. If the receiver was made from a casting, the procedure would, at best, only detect 50% of the possible flaws.

The amperage values listed are also below the requirements of MIL-STD-1949A and ASTM E 1444. The formula for determining coil shot requirements in the coil described is: NI = 45000/(L/D), where I is the required amperage, N is the number of turns in the coil, L is the length of the part, and D is the diameter (or major outside dimension). However, L/D (called the length to diameter ratio) can never exceed 15. If L/D exceeds 15, then 15 must be substituted for L/D. What this means is, when working the formula, the applied amperage through a five-turn coil should never be less than 600 Amps. The length to diameter ratio can never exceed 15, if it does, then 15 must be used. It is impossible to use the prescribed formula and come up with 400 to 500 Amps. By today's standards, the proper inspection might include a couple of coil shots (by shots I mean applications of electric current) plus a couple of direct contact shots and probably a central conductor shot. Any qualified magnetic particle inspector would most probably look at an M14 receiver and say at least two shots were required, and possibly as many as five. If I were inspecting it for myself, I would say five shots.

The magnetic particle inspection applied amperage requirement was changed to 800 to 1200 Amperes by no later than June 21, 1966 as shown on M14 Rifle drawing F7267000. Disclaimer: The above information is for educational purposes. Machining, heat treat or inspection of any firearm receiver or frame should be performed by an experienced firearm manufacturing FFL/SOT. The author is not responsible for any consequence resulting from any attempt by anyone to manufacture, heat treat or inspect a firearm or parts thereof. Such activities should only be performed by businesses licensed and credentialed to do so.

**USGI Receiver Geometry**

USGI M14 and Taiwanese Type 57 receivers are drop forged. The raw receivers were formed by the impression-die drop forging method. The flashing was removed and the finish machining completed on special broaching, milling and drilling machines. Storms Drop Forge (Springfield, MA) was the subcontractor that made the M1 Garand and M14 receiver and component forgings for Harrington & Richardson. The H&R, Springfield

Armory and Winchester receivers would last 400,000 rounds and the TRW receivers were good for 450,000 rounds. [1]

Comparison of the T20E2, the T44 and the M14 Rifles – John C. Garand, father of the M1 Rifle, designed the T20E1 and T20E2 rifles between September 1944 and June 1945 while working at Springfield Armory. At least one T20E2 rifle, serial number 57, was assembled by March 1945. The T20E2 and the M14 both fire from a closed bolt in semi-automatic and automatic, mask muzzle flash with an attachment, accept a bayonet and bipod, launch rifle grenades and have provision for installing a receiver scope mount. T20E2 muzzle velocity is 2,760 feet per second and the cyclic rate of fire is 700 rounds per minute. The select fire components of the M14 rifle are essentially copied from the T20E2 .30-06 caliber rifle. The M14 firing mechanism was borrowed from Garand's 1944 T20E1 design. Nineteen T20E2 rifles were produced by Springfield Armory between May and August 1945 and a number of them remain in the inventory of the Springfield Armory National Historic Site. The T20E2 rifle did not go into production due to the end of hostilities in August 1945. The U. S. Army did produce an operator's manual for this rifle. The T20E2 project ended in March 1948.

The significant differences between the T20E2 and M14 rifle select fire mechanisms are as follows: 1) the M14 rifle has an operating rod dismount notch in the center of the operating rod rail but the T20E2 rifle operating rod is removed through the notch at the rear top edge of the operating rod channel, similar to what is found on commercial manufacture M14 type rifles 2) the T20E2 rifle connector assembly has no operating rod rail "nub" 3) the T20E2 connector assembly is longer than the M14 connector assembly due to the greater length of the M2 receiver 4) there is no underside groove on the forward end of the T20E2 operating rod rail and 5) the forward end of the T20E2 connector assembly is anchored around the connector lock and not on top of it as is the case with the M14 late style connector. The original drawing for the late style M14 connector is dated April 01, 1959.

The T44 rifle was developed from the T20E2 receiver. Between August 1951 and March 1952 the T44 receiver got an operating rod dismount notch in the center of the operating rod rail and the corresponding "nub" was added to the T44 connector assembly. In January 1954, the United States and other North Atlantic Treaty Organization (NATO) nation members adopted the 7.62 x 51 mm cartridge as the standard for rifle ammunition. The new cartridge necessitated redesign of the T44 rifle. Colonel Rayle, Springfield Armory Head of Research and Development, sanctioned a contract with Mathewson Tool Company (New Haven, CT) to produce the drawings for and delivery of twelve shorter length receiver T44 rifles. The first such rifle was delivered to the U. S. Army in June 1954 on schedule. This rifle with the shorter length receiver was officially designated as the T44E4 by October 1954.

A January 1955 Springfield Armory photograph of a T44E4 rifle and associated select fire parts shows a shorter T44 style connector assembly in response to adoption of the 7.62 x

51 mm NATO cartridge. However, this means that the forward underside groove for the operating rod rail was not part of the 1954 T44E4 receiver design (drawing F7267056). The operating rod rail forward underside groove was part of the M14 receiver design when drawn in July 1958 (drawing F7790189).

All three designs, T20E2, T44E4 and the M14, had a hole drilled radially through the right receiver leg. Contrary to popular belief, this hole was not used as a fixture alignment hole to machine the receiver. Instead, the hole allowed workers to use hooks to dip receivers into and out of phosphate coating tanks.

Comparison of Select Fire and Semi-Automatic Receivers - The functional differences between USGI and commercial M14 type semi-automatic receivers are slight but important. The USGI M14 receiver has a notch cut in the center of the receiver rail. This allows for dismounting of the operating rod during disassembly. The forward end of the USGI receiver rail has a groove cut into it on the underside to secure the connector assembly from drifting to the right and losing contact with the operating rod as it moves forward to initiate automatic firing sear release function. The USGI receiver is also manufactured with a selector lug on the rear right hand bottom side. The selector and connector assemblies are attached to the rifle by this selector lug.

The select fire M14 type receiver requires a USGI M14 design sear to allow automatic fire when the selector switch is placed in the automatic fire position. If a commercial reproduction M14 type sear or a M1 Garand sear is installed in the firing mechanism, the rifle will not fire in automatic mode even with all select fire components installed and the selector switch placed in the automatic position. This is because the commercial reproduction and M1 Garand sears are not wide enough to contact the sear release no matter the position of the selector switch. The USGI M14 sear is approximately 5/32 " wider than the M1 Garand and commercial reproduction sear designs.

The operating rod rail center dismount notch and forward end underside groove in and of themselves do not facilitate automatic fire but serve as convenient anchor points for reliable operation of the connector assembly. Nonetheless, law enforcement agencies have thought otherwise and enforced their interpretation of the law accordingly. The reader is strongly encouraged to stay out of trouble with law enforcement agencies and the judicial system. Warning: DO NOT alter any M14 type rifle operating rod rail and DO NOT purchase or possess a M14 type receiver in the United States with these two machining cuts or a selector lug unless it is listed in the National Firearms Act Registry.

USGI Receiver Common Traits – USGI receivers have a distinct machined flat surface with a longitudinal edge on the top of the barrel ring. Springfield Armory, Winchester, Harrington & Richardson and TRW used the upper case letters MM to denote millimeter in their receiver heel stampings.

USGI Receiver Functions - The receiver is the heart of the M14 rifle. The USGI M14 receiver performs the following functions: 1) correctly aligns and securely holds the barrel 2) supports, guides and locks the bolt 3) guides the operating rod 4) aligns and holds the firing mechanism 5) acts as an attachment point for the cartridge clip guide 6) receives the magazine for feeding ammunition into the barrel 7) houses the rear sight and serves as the reference for adjustment 8) holds the bolt lock 9) holds the selector shaft and sear release 10) guides the connector assembly 11) holds the connector lock which secures the operating rod spring guide at the rear end and 12) serves as the means of attaching a mounting platform for optical sights.

The following is a collection of thoughts from Mr. Charles T. Green, a degreed mechanical engineer with over twenty years experience. He is also an expert in the use of CAD software and has created "solid" CAD models of the of the M14 Receiver and other components.

The first glance at the M14 drawing set can be an intimidating experience. For example, the receiver drawing is a large, four page wilderness of views, text and dimensions. And, every inch appears to be covered with cryptic information. These documents represent classic, 'old world' conventions from an earlier industrial era. And, they were typically made by real craftsmen who learned their trade in formal drafting schools. Sadly, they also represent a lost art form displaced by modern CAD computers. And, since drafting conventions change with time, correctly interpreting these documents can be challenging, even for experienced draftsmen and engineers. For example, the Geometric Tolerance system employed predates this engineer's experience by many decades.

Of course, the M14 is a revised version of the M1 Garand rifle. And, the M14 drawings appear heavily influenced by the conventions of the original 1937 Garand drawings. Many of their drawings and individual views appear identical. And, it is possible the M14 draftsmen traced views directly from the M1 drawings to save time and labor. As a young engineer, I personally used this method to create many "board drawings" of turbine engine components while working in the turbomachinery industry. It is a widely used technique. And, it is still used today in companies that have not yet converted to CAD. So, it's not surprising the M14 drawings drafted in 1958 follow the same drafting conventions of the earlier 1937 M1 Garand drawings.

However, the greatest difficulty in understanding these drawings has to do with the rifle's design. Several of the M14's components are extremely complex. And, its receiver is one of the most difficult to machine parts I have ever examined. It easily requires more than 240 machine "set-ups" to manufacture it. Most machinists would probably charge well over $10,000 just to make a prototype. But, it would take a very experienced machinist to do it correctly. And, much of the cost would be for the time spent interpreting the drawing, not to mention making all the tools, jigs and fixtures. I say this because an enormous amount of time was spent studying the receiver drawing while creating a CAD model of it. And, it's understandable why some manufacturers charge over a thousand dollars for their M14 receivers.

This is also why many manufacturers "lost wax" cast M14 receivers before machining their critical surfaces. The noncritical surfaces are left "as-cast." And, this saves significant machine time and cost. The original "Mil-Spec" receivers were forged before machining for principally the same reason. That is, to get a part to "near net-shape" as possible before machining to also reduce cost. Unfortunately, hot forging is often not as accurate or precise as lost wax casting. So, nearly all hot forged surfaces must be machined or otherwise finished. But, forging does have another advantage: it improves strength by refining the steel's grain structure and forcing the grain to flow with the geometry of the part. Cast parts are sometimes heat treated to greater (internal) hardnesses to compensate for this shortcoming. Or, a superior alloy of steel may also be selected. As a rule of thumb, metallurgists and engineers consider forged parts superior to cast. But, cast M14 receivers can have excellent strength. And, the case hardened surfaces of cast receivers are typically just as hard and wear resistant as the forged. Most cast receivers today are considered to be very good. And, this is due in part to the overall strength of the M14 design. - Charles T. Green

**Intervening Rifle Models: M2 through M13**

Until the M1 Rifle was adopted, small arms were designated by date, e.g., M1903. By some time in the 1930s the U. S. Army changed to designating weapons by model number. The M1 Garand was the first rifle. The M1 Carbine was the first carbine. The M1 Thompson was the first submachine gun and so forth. Some of the intervening rifle models between the M1 and M14 are identified as follows:

M2: The M2 was a Springfield Armory .22LR caliber magazine fed bolt action rifle. It was 43.66 " long and weighed 8.87 pounds.

M4: The M4 (T38) was a magazine fed .22 Hornet caliber bolt action survival rifle. Harrington & Richardson made 29,344 M4 rifles in 1949. The M4 weighed 4 pounds and was 32 ½ " long with the telescoping wire stock extended. The M4 had a 14 " barrel and a magazine capacity of five rounds. Earlier models had a leaf rear sight but later models were fitted with an adjustable rear peep sight.

M5: The M5 was a combination .22 Hornet caliber rifle and .410 gauge shotgun. Harrington & Richardson produced fifty M5 rifles in 1950.

M6: The M6 was similar to the M5. It too was a combination .22 Hornet caliber rifle and .410 gauge shotgun. The M6 was developed by the U. S. Army Ordnance Command and produced by Ithaca around 1951. The M6 weighed 3 pounds 12 ounces. It had an overall length of 28 ¼ " and a folded length of 15 ". This model was reproduced by Springfield Armory, Inc. for a time.

M8 and M8C: These were spotting rifles for the 105 mm and 106 mm recoilless rifles, respectively.

M9: This may be a sub caliber device for the 106 mm recoilless rifle but this has not been confirmed.

M10: This model number was not used by the U. S. Army.

M11: This model number was not used by the U. S. Army.

M12: This model designation was assigned to three .22LR caliber bolt action training rifles: 1) Winchester Model 52 Heavy Barrel 2) Remington Model 40X-S1 3) Harrington & Richardson M12. Remington Model 40X-S1 M12 rifles were in the inventory of Marine Corps Junior ROTC units in the 1970s for smallbore rifle marksmanship training and competition. The Harrington & Richardson M12 was a single shot heavy barrel heavy wood stock rifle fitted with Redfield globe front sight and Palma rear sight. It weighed about 13 pounds. The Civilian Marksmanship Program sold this rifle to civilians as late as March 2005.

M13: Likewise, this model number was given to two .22LR caliber training rifles, the Remington Model 513T Targetmaster and the Winchester Model 75 Target. Remington Model 513T Targetmaster M13 rifles were also in the inventory of Marine Corps Junior ROTC units in the 1970s.

The M14 rifle was designated as such in 1957 since that number was the next available model number for a rifle.

**M14 Rifle Development Highlights**

The M14 rifle incorporates a number of designs borrowed from developmental rifles dating between 1944 and 1954. Essentially, the M14 as known today is a slightly improved version of the T44E4 rifle design of 1954. The T44E4/M14 rifle incorporated the following component designs from other rifles:

M1 - hand guard and rear sight

M1E3 - bolt roller

T20E2 - bolt, connector lock, firing mechanism, magazine latching system, operating rod, operating rod spring, operating rod spring guide, select fire components and stock

T25 - gas system and combination front sight, castle nut, setscrew and muzzle attachment assembly

T31 - magazine

T44 series - bolt lock (T44 and T44E1), cartridge clip guide (T44E1) and receiver (T44E4)

The T25 rifle, including the improved Joseph White gas system, was designed by Earle M. Harvey. Remington Arms Co. developed the T44 and T44E1 bolt locks. On the T44, the bolt lock was part of a detachable plate assembly that mounted to the left side of the receiver. By 1953, the bolt lock was held captive by a pin to the receiver itself in the T44E1 rifle. The T44E1 also featured a cartridge clip guide. Otherwise, the component parts listed were the ideas of John C. Garand. He patented the extractor, hammer, magazine, magazine latching system, and rear sight parts. The rear sight assembly was designed for easy one-hand adjustment and reliable keeping of elevation and windage settings even under automatic fire.

Denied his wish for a magazine fed rifle in the M1, John Garand's T31 magazine was further improved by him for the T44E4 (M14). The magazine fed T44E4 (M14) required reloading less often than the M1. In combat, this can be a great advantage. The sheet metal used for the magazine tube, follower and floor plate make it economical to manufacture yet rugged enough to endure combat use. The magazine spring was designed to avoid any tilting of the follower inside the magazine tube or body. Should a follower tilt inside the magazine body it may jam and render the rifle temporarily out of service. In a combat situation, this can be a fatal flaw for the operator. The relative alignment of the M14 receiver with the parts of a magazine work together to feed every cartridge at a slightly upward angle for reliable chambering. A rear side latch plate was added to the magazine tube. The T31 magazine front side rectangular hole was retained. The two features, the latch plate and the rectangular hole, established the means for locking the magazine to the T44E4 (M14) rifle. The latch plate is held securely by the magazine latch. The rectangular hole is retained by the operating rod spring guide. The follower was designed to hold the bolt open after the last cartridge had been ejected from the magazine. The front side of the magazine tube was given a welded lap joint to provide extra resistance to deformation from inertial contact with the cartridges. The double-stack arrangement of the cartridges increases capacity for the same length over a single-stack magazine. The M14 magazine can be disassembled and parts easily replaced in the field though it has proven itself durable. The M14 magazine can be recharged easily whether it is inserted into the rifle or not. Mr. Garand designed the T20 magazine latching system to 1) allow positive retention of the magazine 2) rapid one-hand insertion of a magazine into the rifle and 3) easy one-hand removal of the magazine by simultaneously pressing on the magazine release and pushing the magazine forward and downward away from the stock. A magazine may be inserted either by pushing straight up into the magazine well or reversing the path taken for removal.

Much of the documentation of the development of the M14 rifle from 1952 until 1959 remains inaccessible for public inspection. This documentation is in classified material storage at the National Archives in Washington, DC. During the 1950s, the United States

Department of Defense produced an immense quantity of classified documents related to the development of thermonuclear weapons. U. S. government documents related to M14 rifle development are stored along with the information on nuclear weapons. With the passage of time, the M14 project documents will become available for public inspection. Some highlights of the M14 rifle project are listed below:

July 01, 1957 to December 31, 1957 - Springfield Armory begins development on aluminum M14 magazines. Mathewson Tool Company produces the first experimental aluminum M14 magazines.

1958 - A modified five round Mauser K98 cartridge clip and a magazine filler were developed and adopted. General Tire & Rubber Company delivers fifty T44E6 and M14 reinforced fiberglass stocks under contract from Springfield Armory. Development work was done on the receiver scope mount and improvement of bolt roller durability.

March 18, 1958 – The U. S. Army Ordnance Command awards a contract to Springfield Armory for a pilot production lot of 15,000 M14 rifles.

July 01, 1958 to December 31, 1958 - The M14 Technical Data Package is completed.

October 1958 - The work needed to calibrate the rear sight elevation knob in meters is completed. Aberdeen Proving Ground and Springfield Armory participated in this project.

December 1958 – Springfield Armory begins making production M14 parts.

January 01, 1959 to June 30, 1959 - Several improvements were made to the M14 rifle including: 1) a longer connector lock pin for ease of disassembly 2) modification of the gas cylinder plug and gas piston to make assembly easier 3) modified barrel, gas cylinder and flash suppressor splines to prevent incorrect assembly 4) modification of the barrel diameter to prevent cross-threading of the gas cylinder lock and 5) gas cylinder plug design improvement to prevent cross-threading and thread stripping. Development work continued on the reinforced fiberglass M14 stock.

February 21, 1959 - The Arctic Test Board recommends adoption of the Colley type winter trigger for the M14 rifle.

March 16, 1959 to March 23, 1959 - Two T44E4 bipod designs were tested at Fort Benning, GA for the M14 rifle. Borrowing from John C. Garand's patented M1 rifle bipod, both bipods attached to the bayonet lug. One version did not have any height adjustment. The second bipod model had three height adjustments, weighed 1.28 pounds and could be folded against the stock. Eventually, neither design was adopted. As part of the same test, the M14 rifles were fitted with aluminum butt plates and steel butt plate flappers. Additionally, three types of fiberglass hand guards were tested: Type A - solid, Type B - hand guard with thirty-eight round holes and Type C - hand guard with fourteen slotted holes.

April 10, 1959 - The U. S. Army Infantry Board published the Project Number 2839 report that recommended the adoption of the Type C hand guard and the hinged butt plate for the M14 rifle. The Army Infantry Board report also recommended the M14 rifle with the Type III bipod (referred to as the Type II bipod in other references) as a substitute for the M15 rifle.

July 01, 1959 to December 31, 1959 - Six T140 grenade launchers were made by Springfield Armory. Four of the T140 launchers were sent to the U. S. Marine Corps for testing. Springfield Armory also manufactured twenty-four M6 bayonets of which eighteen were sent to the U. S. Army Infantry Board and the U. S. Marine Corps for testing. A number of fiberglass reinforced M14 stocks were manufactured and sent to the U. S. Army in Alaska for testing. The U. S. Army Continental Army Command standardized the ventilated fiberglass reinforced plastic hand guard and hinged butt plate for the M14 rifle.

July 1959 – The first fifty Springfield Armory M14 rifles were assembled. The stocks and hand guards were made of black walnut.

August 1959 – Ten of the first fifty M14 rifles were shipped to Fort Benning, GA for testing. All shipment of production M14 rifles was suspended pending test results. The Type IV bipod (referred to as Type III in other references) was tested successfully at Fort Benning. It was later adopted and designated M2 Bipod.

September 1959 – M14 rifle testing is completed with satisfactory performance. The M14 hinged butt plate drawings are completed. The first nineteen M14 rifles are assembled and tested at Springfield Armory.

October 1959 – The first Springfield Armory production M14 rifle is presented to Master Sergeant George C. Ferguson by Secretary of the Army Wilbur C. Brucker at Aberdeen Proving Ground, MD.

May 03, 1960 - The U. S. Army Infantry Board concluded its first evaluation of experimental synthetic stocks for the M14 rifle.

June 30, 1960 - A total of 9,471 M14 rifles had been delivered to the U. S. Army.

July 01, 1960 to December 31, 1960 – Aberdeen Proving Ground (MD) successfully develops and tests the XM12 blank firing attachment and a breech shield for the M14. Engineering tests on the reinforced fiberglass stock and hand guard were completed at Aberdeen Proving Ground. The reinforced fiberglass plastic slotted hand guard was found to be superior to the wood hand guard in the testing. Additionally, it was slightly less expensive to manufacture than the walnut hand guard. The fiberglass stocks successfully passed testing as well but the grenade firing test resulted in further development work for improved durability. Development of the M14 National Match rear sight was performed by Springfield Armory including preliminary drawings and manufacture of a prototype rear sight.

October 1960 - Springfield Armory delivers the last rifles from its pilot production order of 15,600 M14 rifles to the U. S. Army.

December 15, 1960 – A number of Harrington & Richardson (H&R) M14 receivers and bolts failed during range firing at Fort Benning, GA.

January 01, 1961 to June 30, 1961 – Springfield Armory makes the first production birch M14 stocks. Walnut became the alternate standard for the M14 stock. The blank firing attachment and breech shield are tested at Fort Benning, GA. Springfield Armory took the initial steps to produce M14 barrels with a 1:10 twist for anticipated testing with 172 grain match grade ammunition.

January 11, 1961 – Ordnance Weapons Command releases Engineering Order No. 164. This document provided additional quality assurance provisions for the bolt, receiver, barrel and rifle. This Engineering Order was the result of investigations conducted by Springfield Armory, Watertown Arsenal, Rock Island Arsenal, Frankford Arsenal and Aberdeen Proving Ground into the H&R M14 rifle failures of December 1960.

April 1961 – Fiberglass hand guards are produced at Springfield Armory.

April 27, 1961 - The U. S. Army Infantry Board received synthetic material M14 stocks for testing and evaluation.

July 1961 - Brigadier General Elmer J. Gibson is appointed as the M14 Rifle Project Manager by the U. S. Army Chief of Ordnance.

July 01, 1961 to December 31, 1961 - U. S. Army soldiers in Europe reported difficulty in stowing and accessing the butt stock cleaning kit. Springfield Armory determined the butt stock storage compartment holes were not correctly located. The affected stocks were repaired and the stock drawing was revised. Springfield Armory conducts limited testing in the M14 National Match project. Springfield Armory was experimenting with the chromium plating process for M14 National Match barrels.

September 21, 1961 – The M12 blank firing attachment, M3 breech shield and M82 blank cartridge were officially classified as Standard A.

September 29, 1961 - The U. S. Army Infantry Board concludes service testing of pre-production synthetic M14 stocks. The synthetic material stock was recommended for adoption with further development requested to improve durability of the bonded seam.

October 02, 1961 - The Preparedness Investigating Subcommittee of the United States Senate Armed Services Committee issued a report on the slow pace of development and implementation of the M14 rifle project.  Starting with developmental work of the T20 rifle in 1945, the first M14 rifle did not reach the U. S. Army until October 1959.  The Senate subcommittee placed the principal fault on the inability of the U. S. Army to procure sufficient funding from the Department of Defense even though Congress had appropriated more funding than had been requested.  The report stated that the large number of M1 Garand rifles in inventory likely contributed to the delay in producing the M14.

October 23, 1961 - The United States Continental Army Command agreed with the September 29, 1961 recommendations of the Army Infantry Board regarding adoption and development of the synthetic M14 stock.

January 01, 1962 to June 30, 1962 – The preservation procedure for birch stocks was developed and adopted.  It required only one dip in tung oil whereas the walnut stocks had been dipped twice.

January 10, 1962 - Secretary of Defense Robert S. McNamara reorganizes the U. S. Army pending Congressional approval.  The Technical Services commands now fall under the authority of the Secretary of the Army.

February 1962 - Congress approves the organizational changes made by Secretary McNamara.

March 1962 - Springfield Armory received the final shipment of 200 aluminum M14 magazines from Mathewson Tool Company per Army Ordnance Command contract ORD-5115.

July 01, 1962 to June 30, 1963 - Work was begun on the Technical Data Package for the M14 NM rifle.

July 1962 - The Mathewson Tool company aluminum M14 magazines were tested with favorable results.

August 01, 1962 - The Ordnance Weapons Command, one of several commands in the U. S. Army Ordnance Corps, becomes the Army Weapons Command (AWC later WECOM) under the newly formed Army Materiel Command (AMC).  The Continental Army Command (CONARC), the Combat Developments Command (CDC) and the AMC emerge as the three major commands of the U. S. Army.

December 20, 1962 - Lieutenant General John P. Daley, Commanding General of the U. S. Army Combat Developments Command (CDC) issues the classified report Rifle Evaluation Study.  The report consisted of an assessment of the rifles, a conclusion and recommendations regarding the future of the tested rifles. The rifles considered were the M14, M14 (USAIB), the commercial version of the rifle later adopted as the M16, the AK47 and the Special Purpose Individual Weapon (SPIW). The Rifle Evaluation Study summed up the primary purpose of the rifle as being an individual infantry weapon capable of engaging direct fire targets out to 400 meters with a selective capability for automatic fire. The report listed the following desireable characteristics for the military rifle: 1) reliability 2) durability 3) lightweight 4) simple 5) accurate 6) flexible 7) lethal 8) acceptable ergonomics and 9) minimal position disclosing effects.

The SPIW was assessed as being the weapon best able to meet all the desired characteristics once fully developed. The commercial version of the rifle later adopted as the M16 was judged second best. That rifle was judged to be a "marked improvement over the M14 rifle primarily because of lower weapon and ammunition weight." The 1962 reports listed the weight of the M14 (Modified) rifle at 9.84 pounds and its loaded magazine at 1.5 pounds. The commercial rifle later adopted as the M16 was listed with a weight of 6.55 pounds and a loaded twenty round magazine weight of 0.75 pounds. This was the turning point for retention of the M14 rifle as the primary infantry rifle in the U. S. Army. General Daley concluded that the commercial rifle later adopted as the M16 was his preferred choice as long as its shortcomings, reliability and poor night firing ability, were rectified. He acknowledged in his report that there was "wide disagreement at all levels" regarding the military value of the commercial rifle later adopted as the M16. The controversy was eventually settled within the U. S. military but it remains a lively topic of debate among civilian firearms owners to the present day.

January 21, 1963 – In light of the December 1962 CDC Rifle Evaluation Study, Secretary of Defense Robert S. McNamara announced the end of M14 rifle procurement with that fiscal year's contracts.

Winter 1963 - A congressional delegation from Massachusetts consisting of U. S. Senator Edward M. Kennedy, U. S. Senator Leverett A. Saltonstall, ranking Republican of the U. S. Senate Armed Services Committee, and U.S. House of Representatives Speaker John William McCormack met with Secretary of Defense Robert S. McNamara. The legislators attempted to persuade Secretary McNamara to award new government contracts to Harrington & Richardson for the M14 rifle. They were unsuccessful in garnering new M14 rifle contracts for Harrington & Richardson but Secretary McNamara said that an effort would be made to see what other military contracts the Massachusetts firm might be able to qualify for.

February 1963 - Harrington & Richardson received a contract for research and development of the SPIW.

April 1963 - The U. S. Marine Corps had removed all defective Harrington & Richardson M14 bolts from its inventory.

July 01, 1963 to June 30, 1964 - A thorough revision was made of the M14 Technical Data Package. The wood M14 stock was redesigned to increase service life.

October 01, 1963 - Springfield Armory completed the Technical Data Package for the M14 (USAIB).

October 1963 – Per request of the U. S. Army Weapons Command, Springfield Armory fabricated and tested four prototype M14E2 rifles. Springfield Armory delivered its last batch of M14 rifles to the U. S. Army.

November 1963 – The U. S. Army officially designated the October 1963 revised design of the M14 (USAIB) as the M14E2. Authority was given to Springfield Armory for 8,350 M14E2 conversions.

June 30, 1964 – Official end of new M14 rifle production. TRW made its only production run of M14 NM rifles in 1964.

July 1964 – Thompson-Ramo-Wooldridge, Inc. delivered the last 200 M14 rifles to the U. S. Army.

December 1964 – Springfield Armory completes delivery of 8,350 M14E2 rifles to the U. S. Army.

July 01, 1965 to June 30, 1966 - Springfield Armory converted 4,489 M14 rifles into M14 NM rifles, 2,094 in 1965 and 2,395 in 1966. Springfield Armory conducted a study to evaluate different heat treatment processes and long term storage effects on M14 magazine springs. Work was begun at the Armory to fill spare parts orders for 64,000 bolts with rollers, 35,000 operating rods and 12,000 stocks. The following decisions were made in M14 design or production:

1) These M14E2 design improvements were incorporated into the procurement system: M2 bipod, winter trigger assembly, muzzle stabilizer with positive locking mechanism, stock back plate, better hand grip, and improved bipod jaws.

2) Design improvements were completed on a synthetic rubber stock pad to smooth out automatic fire under all environmental conditions.

3) Rock Island Arsenal personnel were trained as M14 NM rifle armorers as part of the planned shutdown of Springfield Armory.

4) A study was conducted to determine if increasing the flash suppressor inside diameter would improve accuracy. As a result of the study, Springfield Armory recommended no change in the flash suppressor design.

5) Springfield Armory and Frankford Arsenal conducted a test of ammunition. Springfield Armory recommended adoption of the extractor design part number 7791578.

6) An improved elevation knob and pinion assembly, part number 11010363, was adopted.

December 1965 – The final revision drawings for the firing pin and synthetic M14 stock were issued.

February 1966 - Harrington & Richardson was awarded a contract to manufacture M14 gas cylinder locks.

March 1966 - Harrington & Richardson was awarded a contract to manufacture M14 bolt locks.

May 1966 - Harrington & Richardson was awarded a contract to manufacture M14 gas pistons.

July 01, 1966 to June 30, 1967 – Rock Island Arsenal rebuilt 2,462 rack grade rifles into M14 NM rifles.

July 1966 - Harrington & Richardson was awarded a contract to manufacture M14 selector switches.

August 1966 - Springfield Armory and Rock Island Arsenal armorers worked together at the 1966 National Matches to service M14 NM rifles.

October 1966 - Winchester was awarded a contract to manufacture M14 gas cylinders.

December 1966 – Springfield Armory completed a rebuild program on 24,000 M14 rifles. Harrington & Richardson performed the targeting of these assembled rifles under contract from Springfield Armory.

1967 - Springfield Armory was given an order to deliver 52,780 M14 barrels. Barrel production ran from June into October. Delivery of the barrels was completed by the end of the year.

January 1967 - Springfield Armory transfers responsibility for the National Match Weapons program to Rock Island Arsenal.

May 1967 - Harrington & Richardson was awarded a contract to manufacture M14 connector assemblies.

July 01, 1967 to June 30, 1968 - The technical data was updated and completed for M14 NM rifle barrels.

January 1968 - M14 rifles are used as the test control specimens for evaluation of M16A1 rifles at Fort Sherman in Panama.

April 1968 - TRW was awarded a contract to manufacture M14 bolts.

April 30, 1968 - Springfield Armory was closed. Less than twenty of the 480 Armory employees agree to transfer to Rock Island Arsenal. The majority of the employees went to work at Smith & Wesson, Inc. in nearby Worcester, MA. The M14 production equipment had been crated up and shipped to Rock Island Arsenal. The M14 manufacturing records, drawings and other documents were shipped to the U. S. Army Weapons Command at Rock Island Arsenal and to a federal records center in St. Louis, MO.

August 1969 - Three M14 NM rifles are used as test control specimens in M16 rifle accuracy testing conducted by the U. S. Army Marksmanship Training Unit. The M14 NM rifles shot an average 6.4 " group at 300 meters.

**M14 Rifle Factory Inspection**

Every M14 rifle had to pass several tests before it could be shipped to the military. The M14 rifle was tested by first firing a high pressure 67,500 psi proof round. The rifle and spent cartridge case were examined for any signs of broken parts and overpressure. If the test was successful, the proof P marks were immediately applied to the barrel (P), bolt (a punch mark), stock (P inside a circle or serif P inside a circle) and receiver (punch mark). Winchester M14 barrels have been observed with the letters P and W inside an oval for the proof marking.

The proof test was followed by function tests in semi-automatic, burst automatic, and sustained automatic fire. The rate of fire in automatic had to be within a specified range, 650 to 780 rounds per minute. Each rifle was required to deliver its center of impact within a specified limited area around the point of aim at 100 yards with the rear sight set at eight clicks up from bottom and at zero windage. Every rifle had to group within 5.6 " at 100 yards with five rounds of M80 ball ammunition. Additionally, M14 rifles were tested for tightness of barrel draw, acceptable headspace, firing pin indentation and trigger pull force. The military specification for the amount of trigger pull force was 5.5 to 7.5 pounds for the M14 and 4.5 to 6 pounds for the M14 NM. If the rifle failed, it was tagged to record what the particular problems were. The manufacturer replaced the parts and sent it through the entire inspection process again. Most rifles passed the testing the second time around. The information noted on the tags was recorded and used to analyze the manufacturing process to determine what needed correction.

While a five shot group of 5.6 " at 100 yards may not seem terribly accurate, this includes the inaccuracy of the M80 ball ammunition factored in. The Boston Ordnance District was responsible for final acceptance of M14 rifles manufactured by Harrington & Richardson and Winchester. By Fiscal Year 1962, it had conducted a study into the factory accuracy testing rejection rate of M14 rifles. The Boston Ordnance District discovered that the M80 ball ammunition of itself had an average spread of 3.57 " at 100 yards within every ninety rounds fired. Ammunition inconsistency aside, a rack grade M14 type rifle is accurate for a battle rifle when properly assembled.

In addition to test firing, which every rifle went through, M14 rifles were pulled out at given intervals and subjected to endurance firing for 6000 rounds. One M14 rifle and twelve magazines were selected by a U. S. government representative out of each of the first five lots of 500 rifles at the factory. If each of the five selected rifles passed the endurance test, then the endurance test samples were selected at a rate of one for 2500 rifles produced. This endurance test sampling rate was performed for five lots of 2500 rifles. If these next five rifles all passed the 6000 round endurance test then the endurance sampling rate was upped to one test rifle every 5000 rifles produced.

The 6000 round endurance test was conducted as follows. The rifle was fired first in semi-automatic for 100 rounds followed by five round bursts for another 100 rounds. Then five full magazines were each emptied in automatic with one pull of the trigger for each magazine. The magazines were rotated for even use and the rate of fire was measured during one of the twenty round bursts. The barrel was allowed to cool to ambient after each 100 rounds. The rifle was cleaned and lubricated every 1000 rounds. No cleaning of the gas system was allowed. This procedure was repeated until 6000 rounds had been fired.

Only a small number of any kind of failure was allowed in the 6000 round endurance test. The endurance test allowed no more than twelve malfunctions and no more than two unserviceable parts. The allowable malfunctions and associated instances were as follows: 1) bolt failed to lock into battery – three 2) bolt lock failed to hold the bolt open – one 3) cartridge case failed to eject – one 4) a cartridge that was visible failed to feed – four 5) a cartridge not visible failed to feed – three 5) failure to fire in semi-automatic – three 6) light primer strike – three and 7) punctured primer – one. If any one malfunction occurred more than the allowed number of times or if the total number of malfunctions was more than twelve, the rifle did not pass the endurance test.

No unserviceable parts were allowed in the first 3000 rounds. The allowable unserviceable parts and associated instances for the second 3000 rounds of testing were as follows: 1) ejector – one 2) ejector spring – one 3) extractor – one 4) extractor spring – one 5) firing pin – one. If any one part broke more than once or if there were more than two unserviceable parts, the rifle failed the endurance test. Some of the M14 rifles completed the 6000 round endurance with no malfunctions or unserviceable parts.

Ten M14 rifles selected by a U. S. government representative from each inspection lot were also tested for parts interchangeability. If more than one contractor was producing M14 rifles at the same time, each contractor submitted six specimens each month for parts interchangeability with parts made by the other contractor.

After completion of all firing tests, each bolt assembly was examined by magnetic particle inspection for cracks, seams and other injurious defects. If the bolt passed examination, the bolt was marked with the letter M. The bolt assembly was then cleaned, the roller repacked with grease and the rifle reassembled. Every rifle was given a final and thorough visual examination before preservation and packaging. Sample M14 rifles were tested for cleanliness before packing and the packaging tested for vacuum retention.

**M14 Production at Springfield Armory**

The Springfield Armory was built during the American Revolutionary War. The plot of land it was situated on had been used since the 1600s to train colonial militia units. The site was established as an ammunition depot in 1777 by General George Washington. President George Washington selected Springfield Armory in 1789 to be the first government arsenal. Springfield Armory was officially established in 1794 by an Act of Congress. From 1794 to 1968 the Springfield Armory was the center of military small arms development and production in the United States. The armory tested and manufactured several muskets in the eighteenth and nineteenth centuries for the U. S. Army. It also produced the Krag-Jorgenson, M1903 and M1 Garand rifles prior to the M14 project. The Department of the Army made plans to close Springfield Armory in 1964 and did so on April 30, 1968.

Springfield Technical Institute was established by the City of Springfield, Massachusetts in 1964. It operated under the jurisdiction of the City of Springfield, Massachusetts and the Commonwealth of Massachusetts Department of Health, Education and Welfare. Springfield Technical Institute later moved into three buildings inside the Springfield Armory during the summer of 1967 and began operating under the authority of the Commonwealth of Massachusetts Board of Community Colleges beginning in September 1967. The fifty-five acre site formerly known as the Springfield Armory was renamed Springfield Technical Community College in August 1968. The college continues to serve the people of the Commonwealth of Massachusetts to the present day.

The Springfield Armory National Historic Site was created by an Act of Congress in 1974 and opened in 1978 under the administration of the U. S. Department of Interior National Park Service. Twenty of the fifty-five acres of land were set aside for the National Historic Site. The Springfield Armory National Historic Site has two buildings, the Main Arsenal which is now the Museum, and the Commanding Officer's Quarters which are now National Park Service administrative offices. The Main Arsenal was built in 1850 and the Commanding Officer's Quarters built from 1845 to 1846. The Springfield Armory National Historic Site houses the largest firearms collection in the United States and the second largest in the world.

Springfield Armory was the first of four M14 rifle manufacturers for the U. S. government. It was tasked with setting up a pilot production line in April 1958. Startup of parts production began in December 1958. The first five parts made were the receiver, the bolt, the gas cylinder, the operating rod handle and the trigger housing. M14 production problems at the Armory included obtaining satisfactory precision castings for the flash suppressors, proper welding techniques for the operating rods, and achieving satisfactory heat treatment for the receivers. Except for TRW, USGI M14 operating rods were welded together near the rear end of the cylindrical portion as specified by the drawing.

Springfield Armory made the least number of USGI M14 rifles, 167,107. The first M14 rifles were delivered to the U. S. Army in August 1959 by Springfield Armory. The serial number of the first rifle ever stamped M14 was 2000. M14 production orders were given on March 26, 1958, October 07, 1959, September 1960 and August 1961. Springfield Armory had 400 of 3100 employees involved with development and production of the M14 rifle in August 1961. Springfield Armory also made M14 NM rifles. During Fiscal Year 1964, Springfield Armory developed a dry fire device for the M14 rifle. It appears few, if any, of the rubber hammer bumpers were ever made.

Springfield Armory manufactured two M14 rifles for President Eisenhower in November 1959. Two rifles were made in case one was flawed. Both rifles were given a blued finish. As it turned out, close examination revealed M14 serial number D.D.E. 1 to be flawed but D.D.E. 2 was flawless. M14 serial number D.D.E. 2, with the selector lock, was presented to President Eisenhower. M14 serial number D.D.E. 1 was tested as an endurance test rifle then transferred to the Springfield Armory Museum on October 18, 1960 where it remains on public display. Springfield Armory made a number of other presentation grade M14 rifles in 1959 and 1960. These M14 rifles have four digit serial numbers starting with the numeral 0.

Springfield Armory Machine Tools - In 1968, some M14 project equipment was auctioned off. The remainder was shipped to Rock Island Arsenal for storage. One complete set of fixtures and inspection gages from Springfield Armory was sold to the Government of Taiwan for its T57 project. In 1994, Rock Island Arsenal auctioned off to the public a large quantity of M14 project equipment. The auction records were only kept for five years. This equipment had been used at Springfield Armory. The following describes some of the machine tools in use by Springfield Armory in August 1961:

1. The barrel installation machine screwed the barrel and receiver together with the exact prescribed torque in seconds.

2. Broaching machines were used for high speed removal of metal from the receiver forging.

3. A grinder was used to grind the rear faces of the M14 bolt lugs.

4. A special machine tool was made to make the receiver left bolt camming recess. This is the most difficult machining cut on the rifle.

**M14 Production at Winchester**

Oliver F. Winchester began his business venture into firearms in 1855. Eleven years later, he founded the Winchester Repeating Arms Company in New Haven, CT. He manufactured the first successful repeating rifle in the world in 1866. By 1872, the firm began making ammunition. In 1931, Olin Industries purchased Winchester Repeating Arms Company and combined it with the Western Cartridge Company to form Winchester-Western. During World War II, Winchester-Western manufactured M1 Garand rifles. In 1954, Olin Industries and Mathieson Chemical Corporation merged to form the Olin Mathieson Chemical Corporation. Its name was simplified to Olin Corporation in 1969.

In 1981, the shotgun and rifle manufacturing operation was sold to U. S. Repeating Arms Company, Inc. U. S. Repeating Arms, a subsidiary of Herstal Group, continued the tradition of manufacturing quality shotguns and bolt and lever action rifles under a licensing agreement from the Olin Corporation until 2006. On March 29, 2006 the manufacture of Winchester brand firearms in New Haven, CT came to a halt after 140 years of operation. The U. S. Repeating Arms facility had been manufacturing Winchester Model 94 and Model 70 rifles and the Model 1300 shotgun. The Winchester named operation remains a leading manufacturer of small arms ammunition. The ammunition plants are located in East Alton, IL and Geelong, Australia.

On February 17, 1959, Winchester was the first of three commercial firms to be awarded a M14 rifle contract. Subsequent M14 contracts were awarded on November 30, 1960, April 13, 1962, and October 08, 1962. To win a second contract, the firm agreed to dedicate all of its manufacturing and assembly operations to manufacturing the M14. Winchester executives and officers from the U. S. Army Ordnance Corps held a dinner and ceremony on September 12, 1960 in anticipation of a second M14 rifle contract. A commemorative 8 3/4 " wide ash tray was made by T. R. Mintz Sales Co. (then 286 Blake Street New Haven, CT) for the festivities. Sometime during its production, Winchester also had M14 playing cards printed up with an image of the M14 rifle on the front side of each Ace. The first Winchester M14 rifles were delivered to the U. S. Army in April 1961. Mr. Hurley, a Winchester employee, was interviewed by *Ordnance* magazine in 1961 regarding production of the M14 rifle for the U. S. Army.

Winchester Machine Tools - Winchester designed special milling machines to make the M14 receivers and wood stocks. The company was delayed several months getting the bugs worked out of the receiver making machine tools but was successful in meeting its required monthly production rate by August 1961. The other three rifle manufacturers formed their receivers by extensive broaching. Winchester had the most automated stock making machinery of the four manufacturers. It was successful from the beginning of operation. Winchester produced the second largest number of USGI M14 rifles, 356,501. The following describes some of the machine tools used by Winchester in August 1961 to produce the M14 rifle:

1. The barrel drilling installation consisted of eight machines of six spindles each for drilling barrel bores.

2. The Gorton straight-line transfer machines performed thirty-two high precision machining operations on the receiver automatically.

3. The sixteen station stock inletting machine replaced sixteen single purpose woodworking machines in making wood stocks.

**M14 Production at Harrington & Richardson**

Harrington & Richardson Arms Company began manufacturing firearms in 1874 and produced double action revolvers as early as the 1880s. During World War I, the firm manufactured flare guns and sword scabbards for American troops fighting in Europe. Through the years Harrington & Richardson produced reliable and affordable rifles and revolvers. The company produced more than 400,000 M1 Garand rifles from 1952 to 1956 for the U. S. government. In 1964, along with Aircraft Armaments, Inc., Springfield Armory and Winchester, Harrington & Richardson submitted prototype Special Purpose Individual Weapon rifles to Aberdeen Proving Ground for evaluation. Harrington & Richardson M1 Garand rifles are sought after by collectors. The firm also manufactured and sold a product line of gun barrel drills. The main plant for Harrington & Richardson was located at Park Avenue and Chandler Street Worcester, MA 06109. The company went out of business in 1986.

Harrington & Richardson received its first M14 contract on April 29, 1959. Subsequent contracts were awarded on April 07, 1960, May 10, 1961, February 15, 1962 and October 12, 1962. The first Harrington & Richardson M14 rifles were delivered to the U. S. Army in December 1960. In August 1961 there were about 1,000 employees working on the M14 project at Harrington & Richardson. By 1963, there were over 1,500 employees involved with the M14 project company wide. Harrington & Richardson performed 243 operations to produce each M14 receiver. Harrington & Richardson produced the largest number of USGI M14 rifles, 537,625. The company returned the M14 rifle project documents and equipment to the U. S. government at some point before 1968.

H&R Machine Tools – Horizontal internal rifle broach cutting was a specialty of Harrington & Richardson, Inc. The following machine tools, among others, were in use at the Harrington & Richardson plant in August 1961:

1. The Cincinnati special milling machine was a multi-station mill for finish machining operations on the receiver.

2. The crush grinder was used to grind gas cylinder threads on the M14 barrel.

Receiver and Bolt Failures – Two receivers, serial numbers 19478 and 19656, and four bolts from three manufacturers failed during range firing at Fort Benning, GA in December 1960. Later that month, receiver serial number 73293 fractured during proof firing at the Harrington & Richardson factory in Worcester, MA. The bolt in rifle serial number 73293 suffered abnormal peening on the bottom of the right hand lug and severe indentation on the face of the left lug. Receiver serial numbers 19478 and 73293 were made of incorrect material, AISI 1330 steel, instead of AISI 8620 steel. Receiver serial number 19478 was stamped Winchester but it was one of 850 M14 receivers Winchester had purchased from Harrington & Richardson for initial production. Receiver serial numbers 19478 and 73293 each failed completely in both sides just forward of the receiver lugs.

Subsequent testing of 554 Harrington & Richardson receivers in January 1961 found eight more made from AISI 1330 steel and one made of 4 % nickel alloy steel. The serial numbers of Harrington & Richardson M14 receivers found through testing to be made of AISI 1330 carbon steel were: 69121, 71244, 71927, 71974, 72929, 73761, 74238 and 74486. The high nickel alloy steel receiver serial number was 71408.

The use of the wrong material was an unintentional mishap on the part of Harrington & Richardson. When the receivers made of the incorrect steel were heat treated the result was unsafe. These AISI 1330 steel receivers were weak and brittle. The receivers made of the improper material were destroyed but Harrington & Richardson had to produce the contracted number of receivers. It is not known if the serial numbers from the defective receivers were reused or if new serial numbers were issued for the replacement receivers.

One of the four bolts to fail at Fort Benning was from rifle serial number 19453. It had a completely sheared right lug and a severely cracked left lug. The failed bolt was made by Textile Machine Works, a subcontractor to Harrington & Richardson. A thorough metallurgical investigation of the M14 bolt was performed by government, Ipsen Furnace Company and Armour Research Foundation metallurgists between January and May 1961. The failed bolt was cut into sections and examined using microscope photography. The major fault was the failure to strictly adhere to the written heat treatment procedure even though the correct steel was used. The procedure requires the bolts to be heated to a narrow temperature range then immediately cooled by oil immersion. If the bolts are not brought up to the required temperature or if they are allowed to cool before oil quenching, an excessive amount of free ferrite is formed. Ferrite is soft and weak iron. Ferrite does not bond with carbon atoms so the freed up carbon atoms moved into the rest of the bolt. This condition in the HRT bolt created a very hard and brittle martensite molecular structure. Under repeated impact loading from the rifle being shot, cracks formed and grew in the lugs, resulting in catastrophic bolt failure.

A task force of about forty Army Ordnance Command representatives met on December 28 and 29, 1960 to determine the causes of failure and to implement a plan of action to prevent any more such failures. After the meeting, a combined team from Springfield Armory and Boston Ordnance District visited the following contractors and subcontractors to review M14 component manufacturing procedures and obtain samples for evaluation: Winchester in New Haven, the Rochdale and Worcester H&R plants, Storms Drop Forge, and Textile Machine Works. The following deficiencies were noted by the team:

1) M14 bolts at the Winchester plant were not quenched according to good engineering practice for 8620 steel. Additionally, there was no magnetic particle inspection of Winchester M14 bolts after proof firing.

2) Receivers that missed steps in the machining process were reworked by spot annealing and hand grinding at Harrington & Richardson.

3) Winchester was unable to meet the minimum core hardness limit for bolt heat treatment.

4) Textile Machine Works was unable to meet the maximum core hardness limit for bolt heat treatment.

Further, a Lackland Air Force Base report dated December 1960 revealed oversize chambers in H&R M14 barrels. The M14 barrel inspection gage measured chamber diameter at 0.5 " from the breech but the excessive diameter was located at 0.4 " from the breech. Thus, the oversized chamber in H&R M14 barrels had gone undetected. During testing of H&R M14 rifles with oversized barrel chambers in March 1961 at Aberdeen Proving Ground (MD), one early production Winchester bolt failed after 3,100 rounds in the cold room test due to excessive free ferrite.

Springfield Armory test rifle bolts which had gone thousands of rounds were examined for similarities and differences with the failed HRT bolt. The test rifle bolts demonstrated that minor cracks may start in the hardened surface but they do not grow through the bolt core if the heat treatment is correctly performed. Properly heat treated bolts were found generally to have less than 10 % free ferrite but the bolt from receiver serial number 19453 had as much as 50 % free ferrite. The end result was additional quality assurance provisions as required by Ordnance Weapons Command Engineering Order No. 164 released on January 11, 1961. This Engineering Order applied to the first and second Winchester contracts and the first Harrington & Richardson contract. These new requirements included a revised inspection procedure for the barrel, bolt and receiver, installation of new heat treatment equipment and a magnetic analyzer to check receiver material. The revised inspection procedure included two separate magnetic particle inspections of each receiver and bolt, before and after heat treatment. The magnetic analyzer was developed by Springfield Armory with assistance from Watertown Arsenal.

On April 23, 1961, Ordnance Weapons Command issued instructions to Raritan Arsenal to inspect, segregate and reassemble approximately 35,000 Harrington & Richardson and 850 Winchester M14 rifles manufactured before the issuance of Engineering Order No. 164. The instructions required inspection of the barrels, bolts and receivers for compliance with material, hardness and dimension specifications. Springfield Armory provided technical assistance, training and inspection equipment for this work at Raritan Arsenal. The relevant portion of the May 08, 1961 Springfield Armory report is reproduced here:

"Regarding cracks in bolt locking lugs, numerous firing tests at Springfield Armory have proved minute cracks in bolt lugs do not cause early failure if metallurgical structure of bolts is correct and bolts and receivers are dimensionally correct.

On 23 April 1961, instructions were issued from Hq. OWC on the inspection criteria to be observed at Raritan Arsenal for the inspection segregation and reassembly of M14 rifles. The instructions are as follows:

After careful evaluation of available tests and performance data, and with due consideration to the urgent requirements for M14 rifles, the following are effective immediately:

(a) M14 bolts manufactured prior to the implementation of OWC EO 164 except HRT lots A01 and A1980, and those 850 OMCC bolts in weapons at Raritan Arsenal returned from the field are acceptable for immediate assembly provided the following 100 % reinspection is conducted:

(1) Check for compliance with surface hardness requirements.
(2) Inspect for cracks at lug area using 600 amperage on Magnaglow inspection. No cracks are permissible
(3) Inspect for compliance with the 0.028 minus .008 radius and toll marks in lug area in 4 locations.
(4) These bolts will not be used for repair parts.
(5) All bolts in the above category will be marked or etched below the part number or serial number with a small identifiable star or asterisk.

(b) Receivers meeting all other contract requirements are 100% acceptable provided inspection is conducted to insure:

(1) Compliance with specified surface hardness requirements.
(2) That proper steel was used in manufacture as determined by use of a magnetic analysis comparator. Receivers exceeding plus 40 reading shall be rejected. Receivers exceeding minus 40 may be accepted but will be marked or etched with a small

identifiable star or asterisk.

(c) Dimensional requirements for both components remain unchanged.

(d) Boston Ordnance District was authorized to approve RDA's for bolts meeting the criteria previously stated.

(e) In addition, instructions have been established to accept oversized chambers in weapons at Raritan Arsenal up to .005["] maximum over the drawing tolerance."

Random sample USGI M14 bolts that had passed all required government inspection and testing measured 52 HRC (HRT marked bolt) and 54 HRC (TRW marked bolt) for surface hardness. Springfield Armory and Winchester carburized M14 bolts by the salt bath method whereas Textile Machine Works used the ammoniated gas method for bolt carburizing.

The bolt is the second hardest part to manufacture on the M14, the receiver being the most challenging. The drawing requirements for the M14 bolt were revised a lot as the M14 project developed. The bolt drawings were originally created in July 1958 and last revised in December 1992 (Revision Y). No other M14 rifle part drawing went through as many revisions.

Due to the bolt failures in late 1960, a lot of research was performed by the U. S. Army into the design and manufacturing process of the M14 bolt. There were bolt failures in five USGI M14 rifles: Harrington & Richardson serial number 73293, Springfield Armory serial number 19656, and Winchester serial numbers 19453, 19478 and 19391.

Three of these bolts had excessive free ferrite but two did not. As a result of the bolt failures, the U. S. Army inspected 33,808 bolts from rifles under serial number 90000. 26,848 of the 33,808 bolts were reused. The inspection tests done on the M14 bolts included magnetic permeability comparisons, measurement of basic magnetic properties, oscilloscope wave form pattern studies, hardness testing, and impact testing at ambient and cold temperatures. The 6,960 bolts pulled from service were due to: 1) surface hardness outside the specification 2) high temper or retemper 3) core hardness greater than 45 HRC 4) core hardness less than 35 HRC 5) core with excessive free ferrite or 6) other unfavorable conditions. The bolts tested had core hardness as high as 46 HRC and as low as 31 HRC. Within a single bolt, it was not unusual to have the core hardness vary up to 4 HRC. Surface hardness was usually within 1 HRC for any point sampled on a given bolt. The bolts sampled ranged from 52 to 62 HRC on the surface.

As of January 1962 (drawing F7790185 Revision H would have been in effect), the heat treat requirements for the M14 bolt were:

Surface - 54 to 59 HRC

Core - 35 to 42 HRC
Case depth - 0.015 " to 0.020 "
Temper temperature - 425 degrees F maximum
Core structure - 10 % free ferrite maximum

With the exception of the five failed bolts from USGI rifles under serial number 75000 and the 6,960 USGI bolts pulled from service, new manufacture USGI M14 bolts have been found acceptable for use by the U. S. Army. USGI M14 bolts made under the final set of heat treatment requirements (drawing F7790185 Revision L and later) were made by Winchester (rifles) and TRW (rifles and spare bolts).

The final heat treatment and hardness requirements for the USGI M14 bolt were established in November 1963:

1) Rockwell hardness readings shall be taken on the top surface of the locking lugs and at the vertical surface of the rear end.

2) Bolt material - 8620H alloy steel except resulphurized content at 0.035 % to 0.50 % that is gun quality specification per ASTM A304, A322, or A331. Hardenability of steel shall be controlled as required to suit manufacturer's heat treatment process and to assure that the specified mandatory physical properties are met. Austenitic grain size is 5 to 8.

3) Heat treatment recommended process - normalize before machining (oil quenching followed by tempering at not more than 450 degrees Fahrenheit may be used in lieu of air cooling). Carburize at 1550 degrees Fahrenheit to 1600 degrees Fahrenheit to the specified case depth. Without reheating, quench in oil or neutral salt bath from 1500 degrees Fahrenheit to 1600 degrees Fahrenheit. If reheated, quench from 1550 degrees Fahrenheit to 1600 degrees Fahrenheit. Temper to the specified hardness.

4) Heat treating mandatory requirements -

A. Normalize before machining.
B. Carburize to a case depth of 0.012 " to 0.018 ".
C. Temper for one hour minimum at 350 degrees Fahrenheit to 450 degrees Fahrenheit.
D. Core hardness is 33 HRC to 42 HRC. Surface hardness is 66 HRD to 71 HRD (54 HRC to 60 HRC).
E. Microstructure of the core shall not contain more than 10 % free ferrite after heat treatment per AMS 2315.
F. The use of a straight cyanide bath or carbonitriding shall not be permitted.
G. When gas carburizing is used the carbon content shall not exceed 0.84 % at the surface of the bolt per AMS 2762.

A 1961 Watertown Arsenal study of the M14 bolt found its tensile strength to vary, as expected, from 275,000 psi at the case hardened surface to 200,000 psi at the inner edge of the case depth to 138,000 psi in the core. The rear inside corner of the left lug is the point of maximum stress for the M14 bolt when a perfectly machined receiver is mated to a perfectly machined bolt.

The M14 bolt lugs are subject to shear stress when the operating rod pushes the bolt back against the receiver lugs. The bearing surface of the bolt lug and the radius of the inside corner of the rear side of each bolt lug influence the magnitude of stress experienced by the bolt. The rear side of the left bolt lug has a smaller bearing surface than the right side lug so it experiences a higher shear stress.

The sharper, or more perpendicular, the inside corner of the rear side is cut the more severe the stress on the bolt lug. Consequently, the USGI drawing F7790185 specifies a minimum radius of 0.028 " - 0.008 " for the inside corner on the rear side of both bolt lugs. This dimension is absolutely critical to limit the maximum shear stress on the bolt. For example, the Watertown Arsenal study indicates that the maximum shear stress at the left lug rear side inside corner would increase by 28 % (assuming full bearing surface contact) by changing the radius dimension from 0.020 " to 0.011 ".

**M14 Production at TRW**

Thompson-Ramo-Wooldridge, Inc. was the fourth and last of the USGI M14 rifle manufacturers. It is referred to as TRW throughout this work. The earliest origin of TRW was in the 1901 founding of the Cleveland Cap Screw Company. Cleveland Cap Screw made bicycle parts. Eventually, this business was renamed Thompson Products and expanded into manufacturing automobile and aircraft engine parts. In 1958, Thompson Products merged with Ramo-Wooldridge to form Thompson-Ramo-Wooldridge Corporation. Ramo-Wooldridge, Inc. was formed in Los Angeles, CA on September 16, 1953 by Dr. Simon Ramo and Dr. Dean Wooldridge. Ramo and Wooldridge were featured on the cover of the April 19, 1957 issue of *Time* magazine. Dr. Wooldridge retired in 1962 and went on to involve himself in the study of neurology. The five major business groups of TRW in 1962 were Automotive, Electro-Mechanical, Electronics, Space Technologies Laboratories and TRW International. The corporate name was changed to TRW, Inc. in 1965. Four years later, TRW sold off its Space Technology Laboratories group. This spin off enterprise was known as Bunker-Ramo. Simon Ramo was the President of Bunker-Ramo. By no later than 1970, the Systems Group (Redondo Beach, CA) worked on ordnance and automotive projects for TRW.

In 1999, there were two principal divisions, TRW Automotive and TRW Aerospace & Information Systems. The same year TRW Automotive bought the British aerospace and automotive parts manufacturer LucasVarity. In 2002, TRW employed 100,000 workers. In December of the same year, its defense business was purchased by Northrop Grumman. The automotive portion of the business became a separate company for a short time but was then bought by The Blackstone Group. Goodrich Corporation took over the TRW aerospace business.

TRW received its first M14 contract on October 02, 1961. The second M14 contract was let on October 08, 1962 and a M14 NM contract in Fiscal Year 1964. In late 1961 and the first half of 1962, its Jet & Ordnance Division plant (23555 Euclid Avenue Cleveland, OH 44117) was remodeled and set up for M14 production. This plant was known as the Ordnance Works of the Electro-Mechanical Group within TRW. In October 1962, J. Wright was the Chairman of the Board at TRW. TRW manufactured the third largest number of USGI M14 rifles, 314,789. Government contract production of M14 rifles ended at TRW in July 1964. TRW went on to be awarded a U. S. government contract in Fiscal Year 1966 for M79 grenade launchers. Some of the TRW M14 manufacturing operation is briefly described.

The principal stages of TRW M14 receiver manufacture were: 1) steel slug cut off from bar stock 2) drop forging after warm size 3) chain broaching and qualification broaching 4) machining through three dimensional mills 5) additional broaching and 6) phosphate coating.

The principal stages of TRW M14 bolt manufacture were: 1) cut off steel slug 2) extrusion 3) warm-coining 4) thirty machining operations on the Krueger lateral transfer machine 5) ten machining operations on two five station special milling machines and 6) phosphate coating.

The principal stages of TRW M14 operating rod manufacture were: 1) cut off steel slug 2) bump up and roll 3) warm sizing 4) finish machining and 5) phosphate coating.

TRW Machine Tools - The following describes some of the machine tools in use by TRW in November 1962:

1. The Allen multi-station drilling machine drilled all the small holes in the receiver.

2. The bolt assembly fixture completely assembled the bolt except for the roller.

3. The Colonial fifteen station pull-type broach cut the receiver magazine slot.

4. The Footburt 144 " chain broach was used for the first stage in receiver machining.

5. The Krueger lateral transfer machine performed thirty machining operations on two bolts at the same time including precision boring, reaming, gun drilling, hollow milling, and automatic gauging and inspection.

6. The Seneca Falls tracer lathe completed barrel exterior contour turning in two passes.

**The TRW Mystique**

TRW rifles and parts have a long-standing reputation as better made than those from the other three M14 manufacturers. This was obvious as early as late 1962 from facts described below. The first TRW rifles were delivered in October 1962, one month ahead of schedule. TRW's production record and the quality of its rifles brought enthusiastic praise from the Department of Defense and from the press.

TRW was ahead of Winchester and Harrington & Richardson in a number of ways. Because of its background, TRW had a broader and more sophisticated production experience. TRW considered itself to be highly skilled in the manufacturing techniques of precision forging and chain broaching. Because of its jet engine work, TRW possessed state-of-the-art knowledge of metallurgy and heat treatment. The company was adept at making small batches of custom order aircraft parts.

This knowledge and manufacturing flexibility served TRW well when setting up the M14 project. TRW made only eleven parts during its M14 rifle production. These eleven parts (rear sight base, receiver, trigger housing, hammer, bolt, operating rod, barrel, connector, gas piston, gas cylinder, and flash suppressor) amounted to a little less than 65 % of the cost to the government. TRW also made firing mechanism safeties. TRW M14 safeties were likely replacement parts made after rifle production.

In 1962, Stanley C. Pace was the Electro-Mechanical Group Vice President for TRW. Mr. Pace was a Class of 1943 West Point graduate, World War II bomber pilot and Prisoner of War. After the war, he rose to the rank of Colonel in the U. S. Air Force. He left the Air Force in 1954 to join Thompson Products in Los Angeles, CA. He demonstrated superb leadership and management skills at TRW. Consequently, he was transferred to the TRW Jet Engine plant in Cleveland, OH to turn around that struggling facility. Mr. Pace went on to concurrently manage both the Electro-Mechanical and Space Technologies Laboratories Groups. By no later than 1979, he was President of TRW. He was set to retire in 1985 but was persuaded to take the helm as Chairman and Chief Executive Officer at General Dynamics Corporation which suffered from a poor reputation at the time. Under his leadership including establishment of uncompromising ethical standards, General Dynamics reestablished itself as an ethical defense contractor and expanded its line of defense products. Mr. Pace eventually retired. In 2001, he was honored by the Association of Graduates at the United States Military Academy with the Distinguished Graduate Award for his lifetime of service.

The expertise of TRW is borne out by the 1962 *American Rifleman* interview of Stanley C. Pace. Mr. Pace explained how TRW's personnel applied its jet engine manufacturing experience to the production of M14 rifles. TRW settled on making what parts it could make economically well (based on its expertise), and subcontracted out the remaining parts which were easily manufactured from conventional methods. TRW machined single piece operating rods from forgings. Barrel interiors were formed by German design hammer forging. Barrel exterior contours were formed in two turning passes by using a Seneca Falls tracer lathe. The Seneca Falls tracer lathe replaced six conventional machine tools. The same barrel operation required four turning passes at Winchester. The TRW automatic barrel installation machine was similar to the other makers but it had some changes based on the experiences of the other manufacturers. As previously mentioned, TRW receivers gave about 6 % longer service life than others. TRW did assemble, test and ship all completed M14 rifles stamped with its logo on the receiver heel. Later on, TRW became the only commercial contractor to ever produce the USGI M14 NM rifle.

The M14 failure rate was 5 % to 12 % from all causes among Springfield Armory, Winchester and Harrington & Richardson as of August 1961. TRW had assembled and tested its first M14 rifle on August 23, 1962, three months ahead of the contract schedule. By November 1962 TRW M14 production was 100 per day and it had had no rejections to date. The largest five shot group of any TRW rifle up to November 1961 was 5.5 " out of a maximum allowable 6.1 " at 100 meters. The average five shot group size for TRW rifles until November 1962 was 2.5 " to 3.0 " in factory testing. The M14 NM contract was completed and the rifles delivered to the U. S. Army in time for the 1964 National Matches at Camp Perry.

The Department of Defense Project Manager's weekly action report for the second week of February 1965 stated the following:

> Marine Corp units in Hawaii submitted Equipment Improvement Reports pertaining to surface defects noted in M14 Rifles manufactured by Thompson Ramo Woolridge [sic]. Similar defects were noted in rifles in the 25th Infantry Division. Sample rifles were flown to WECOM for preliminary inspection and tests, and were subsequently flown to Springfield Armory for thorough evaluation. Investigation to date indicates that there is no unsafe condition, only surface roughness, and there are no known barrel failures. Records of manufacturing inspections reveal that there was some surface etching of barrels being used by TRW, and that after adequate special testing, the barrels were accepted for production. Interim reports of findings have been made to the Marine Corps and a final report of findings by Springfield Armory, expected late next week, will be promptly forwarded to the Marines. Rifles in question have been suspended from firing pending outcome of the investigation. General Greene has reportedly indicated a feeling that this matter should be treated as sensitive.

With very few exceptions, all four manufacturers were required to use the same material and meet the same specifications in making M14 rifles. Known exceptions include chromium-molybdenum-vanadium alloy steel barrels in the second Winchester contract and some Harrington & Richardson operating rods made from AISI 8655 alloy steel. One such Harrington & Richardson operating rod was sampled for hardness in 1995. It measured 32 HRC. The TRW mystique was further strengthened by the growing pains suffered by Winchester and Harrington & Richardson in 1960 and 1961. Overall, it is fair to say that TRW had the most trouble-free production record of the four manufacturers. Sometimes it pays to be last but it always pays to plan well and learn from others.

In a last hurrah for its involvement with small arms programs, the TRW Systems Group was awarded a contract in February 1971 by the Defense Advanced Research Project Agency and the U. S. Army Small Arms Systems Agency to develop the Low Maintenance Rifle. The final TRW design consisted of a 5.56 mm caliber gas operated roller-locked bolt automatic firing only rifle that used M16 magazines fed from the left hand side. The rifle featured a 19.4 " barrel, a pistol grip for the firing hand, a M60 machine gun trigger mechanism, 300 meter and 500 meter flip-up rear sight apertures, and a post front sight. It was designed to accept a detachable light, bipod or M7 bayonet. The TRW LMR weighed 7.9 pounds with a loaded magazine and had an overall length of 34.25 ". It was made from corrosion resistant materials and had dry lubricant surface finishes that minimized the need for cleaning. No tools were necessary for disassembly or assembly. The TRW LMR fired from an open bolt at a cyclic rate of 450 rounds per minute. TRW had completed its development on the LMR by March 1973 with a number of sample rifles delivered to the U. S. Army for evaluation. Funding for the LMR ceased in 1973 because American involvement in southeast Asia had ended and the Army was satisfied with the M16A1 by that point.

**Raritan Arsenal**

Some changes in the design of the M14 rifle occurred after the earliest rifles had been shipped to the Army. This included adoption of a slotted fiberglass hand guard and hinged steel butt plate and altering the upper butt plate screw in 1960. The earliest production M14 rifles were inspected and reworked as needed, and modified to incorporate the latest changes. These changes were published as Modification Work Orders issued by the U. S. Army Ordnance Command. This work was being done at Raritan Arsenal (Metuchen, NJ) as of August 1961. Raritan Arsenal also had the responsibility of managing the inventory of small arms training aids until it was decommissioned by the U. S. Army in 1963.

**Experimental Items for the USGI M14 Rifle**

M14 Simulator Rifle - Harrington & Richardson, Inc. developed and produced the Simulator, M14, .22 Caliber Mark 1 select fire rifle in 1959. The M14 Simulator weighed 7.8 pounds and was 44 " long with a 22 " barrel. It was based on the Harrington & Richardson Reising Model 65 semi-automatic .22 LR rifle. Mr. Eugene G. Reising, an employee of Harrington & Richardson, invented many firearms including the Model 50 submachine gun. Harrington & Richardson took this project on because of a conversation in March 1959 with Dr. Frederick H. Carten, Chief of Small Arms Research and Development in the U. S. Army Ordnance Corps.

The purpose of the M14 Simulator rifle was to provide an economical training rifle to complement the M14. Harrington & Richardson employee, Les Mulno, had finished building the M14 Simulator by May 1959. One of the M14 Simulator rifles was submitted to Springfield Armory in December 1959 for evaluation purposes. At least one model, serial number X-26, was semi-automatic operation only. The serial number for one of the select fire models was XX1. Harrington & Richardson kept a small number of M14 Simulator rifles until 1986 when they were auctioned off due to going out of business.

M14 Trainer Rifle - The only officially adopted .22 caliber rifle for the M14 rifle was the Harrington & Richardson, Inc. MC-58. Like the M14 Simulator above, it was a modified Model 65. It included a trigger guard safety similar to the M14. The MC-58 rifles were marked on the barrel USMC PROPERTY, MODEL MC-58 or U.S. PROPERTY MODEL MC-58. About 3,500 MC-58 rifles were produced in the late 1950s.

Winter Triggers - Martin H. Colley patented his winter trigger for the M1 Garand rifle in 1952. It was tested by the U. S. Army on the T44 in 1953 and 1954 at Big Delta, Alaska. There were at least two winter trigger devices specifically designed for the T44E4, one made by Mathewson Tool Company and the other crafted at Springfield Armory. Mathewson Tool Company experimented with the Eugene Bourquin patented trigger actuator as a winter trigger. Mr. Bourquin had designed his trigger actuator for rifles fitted with grenade launchers. Springfield Armory had developed the T6 Auxiliary Winter Trigger for the T44E4 by no later than June 1955.

Picatinny Arsenal (Morris County, NJ) designed a winter trigger with safety for the M14 in 1959. The Picatinny Arsenal winter trigger was adapted for the M14 based on the patented design of Andrew J. Marhefka and Irving L. Kintish. When adopted in 1959, the production winter trigger kit included a winter safety. It was classified as the M5 winter trigger.

In 1962, Springfield Armory employee Giulio Savioli designed two M14 rifle auxiliary triggers for use with cold weather mittens. The designs were patented in 1963 and 1964. The XM152 winter trigger was developed for the M14A1. It was tested in the Arctic in 1965. The XM152 still retained its experimental designation as of July 2006 as an item in the Equipment List of the M14A1 Technical Data Package.

There was at least one other experimental design T44 series rifle cartridge clip guide made aside from the T44E6 aluminum cartridge clip guide. In 1961, Springfield Armory produced an extended bolt lock (Springfield Armory part number 27907) for the M14 rifle but it was not approved for use by the U. S. Army.

Magazine Loading Devices - In the mid-1950s, several magazine charging devices were experimented with for the T44 series rifles. These included various wire frame chargers and a semi-expendable magazine classified as the T16 magazine charger. At least two 10 round frame charger designs were patented in the 1950s for the T44/M14. The ten round cartridge clips were not found to be satisfactory in testing. By 1958, a five round modified Mauser K98 design cartridge clip (stripper clip) had been developed, tested and adopted for the M14. The force necessary to strip a cartridge from either end of a fully loaded cartridge clip was required to be not less than 1.8 pounds and no more than 4.7 pounds. The early version M14 magazine filler was also developed at the same time.

Magazines - Two hundred aluminum M14 magazines were produced by Mathewson Tool Company and tested by Springfield Armory in 1962. Whether or not they were made by

Mathewson Tool Company, some aluminum M14 magazines did get issued in the 1960s. These aluminum magazines had an anodized finish. They varied from the steel production magazines in that the seam of the front side is reversed and there is only one weld "dimple" on the latch plate. An aluminum M14 magazine weighs approximately 4.25 ounces as compared to 8.25 to 9.00 ounces for the standard (carbon steel) twenty round M14 magazine.

Springfield Armory produced some mostly plastic twenty round M14 magazines that had a small "fence" of sheet metal at the top end to which the plastic body was molded. The plastic M14 magazines were made in an attempt to save money. The experimental plastic M14 magazines did not hold up well in testing and were thus discarded. Springfield Armory experimented with black, brown, gray, olive drab, tan and white colored stocks in the first half of the 1960s during development of the synthetic M14 stock. Rock Island Arsenal designed and manufactured an XM21 experimental two point scope mount in 1970.

The U. S. Army experimented in the second half of the 1960s and the early 1970s with twenty round plastic magazines for the M16 and M14 rifles in the Expendable Magazine Project. At least some of the plastic M14 magazines were sent to Fort Benning by November 1972. Two credible eyewitnesses, both U. S. Army veterans who carried the M14 rifle in the Republic of Viet Nam, report seeing or using USGI thirty round M14 magazines issued to them or other soldiers in their units while in the Republic of Viet Nam. One veteran was a member of the 2$^{nd}$ Battalion, 8$^{th}$ Cavalry Regiment, 1$^{st}$ Cavalry Division and the other was assigned to the 2$^{nd}$ Battalion, 94$^{th}$ Field Artillery, 108$^{th}$ Artillery Group. Some disposable plastic pre-filled thirty round M14 magazines were reportedly made and tested by Rock Island Arsenal in the early 1970s as part of this project but this has not been confirmed.

Dr. Carten became Chief of Small Arms Research and Development in August 1953 when Colonel Rene Studler retired from the U. S. Army. Dr. Carten watched over the T44 project at Springfield Armory. He became the Chief of Technical Evaluation Branch for the Research Development & Equipment Directorate when the Army Materiel Command was formed in August 1962 and remained there until at least 1970. Dr. Carten used his position and influence to delay adoption of a smaller caliber cartridge by several years within the U. S. Army. He was a firm believer in the suitability of the 7.62 x 51 mm NATO cartridge for military purposes.

Iron night sights - The design of a night sight for the M1 and M14 rifles was developed by Jack F. Kettler of Fort Leavenworth, KS by no later than May 1959. Springfield Armory referred to this weapon night sight as multilite sights.

The multilite sights consisted of two flip-up metal posts, one just aft of the front sight and one just forward of the rear sight. Each flip-up post was made integral to its standard iron sight counterpart. Both flip-up posts contained two sighting elements, one luminous and the other highly reflective. From no light to half-moon light, the luminous elements provided sufficient light for aiming. The reflective points were used for aiming the rifle in low light conditions better than half-moon light. The Kettler patent suggested either steel or plastic material for the structural portions of the multilite sights, commercial grade radium-activated phosphorous compound for the front and rear luminous elements and plated or stainless steel spheres for the highly reflective elements.

The luminescent sight material actually used in the multilite sights was promethium-147. Promethium is number sixty-one on the periodic table of elements. It is classified as a rare earth element and is produced from nuclear fission. It is radioactive. One isotope, promethium-147, can be made phosphorescent. Promethium-147 has a half-life of 2.64 years. It has been used in analog dial watches and in early M16A1 rifle sights. The promethium-147 was captured in ceramic microspheres and sealed with phosphor inside glass ampoules for the M16A1.

Using prototype sights supplied by the Infantry School at Fort Benning, Springfield Armory designed and fabricated in late 1959, two versions of weapon night sights. In 1960, these sights were tested on the M14 rifle in the field at Fort Benning and in Alaska. Barrel heat created from firing caused the luminescent material to loosen from the night sight posts during the testing at Fort Benning. The adhesive employed for attaching the luminescent material to the sight posts did not last at elevated temperature. Arctic testing of the night sights revealed cracks in the luminescent sight material after ten minutes of sustained firing.

Subsequent to this, Springfield Armory improved the design of the experimental M14 rifle night sight. The improved design resulted in use of an appropriate adhesive to secure the luminescent material to the night sight posts. The newer design also allowed the night sights to be zeroed at a distance of 100 to 150 yards by first zeroing the standard iron sights at the same distance.

Reflex-Collimator Optical Sight - More than 102,000 M1 Garand rifles were exported by the U. S. government through military assistance programs to the Republic of Viet Nam. The M1 rifles were issued to local Civilian Irregular Defense Group (CIDG) units in the Republic of Viet Nam. Among many other duties, U. S. Army Special Forces advisors trained CIDG troops in the use and care of the M1 rifles. By no later than February 1965, the U. S. Army Test and Evaluation Command (Aberdeen Proving Ground, MD) was aware that the Special Forces advisors had difficulty teaching CIDG personnel how to use the M1 rifle sights. Consequently, the U. S. Army Limited Warfare Laboratory developed a reflex-collimator optical sight that would replace the issue iron sights on the M1 and M14 rifles for short and medium distance shooting.

The Limited Warfare Laboratory reflex-collimator optical sight consisted of horizontal and vertical cross hairs inside a sighting tube mounted to the rear sight pocket of the rifle. The advantages were ease of training and operation and much less weight and bulk than a traditional rifle telescope sight. The Limited Warfare Laboratory had published a set of operating and maintenance instructions for this sight in November 1965. Nine reflex-collimator optical sights, eight of the original design and one of an improved design, were tested at Aberdeen Proving Ground from January 24 to June 14, 1966. The original design sights were installed on M1 and M14 rifles. The optical sights were then put through a gauntlet of tests totalling 1,559 rounds fired per rifle - accuracy, protracted firing, cold weather, hot weather and water spray. The accuracy tests compared the shot dispersion using the reflex-collimator sight at 50 meters, 250 meters and 500 meters. The same accuracy test was repeated with the same shooter using issue iron sights. The reflex-collimator optical sight produced a 40 % greater dispersion of shot placement than the issue iron sights. The reflex-collimator optical sights were lacking in durability. All nine of the sights had cracked or loosened parts caused by the shock of firing the rifle. The sights also exhibited significant parallax. Parallax is where the sight aiming reference point, e.g., cross hairs or red dot, seems to move away from the target when the shooter changes his cheek weld. For these reasons, there was no further development of the idea by Aberdeen Proving Ground.

The Farrand Optical Company (Bronx, NY) developed a collimated sight in 1967 for the M14 rifle. The sight attached to the left side of the M14 receiver while retaining the issue iron sights. Presumably, this sight was intended for military use. Although the U. S. Army project did not produce a viable firearms optical sight, the dot sight concept was developed for commercial use by Aimpoint AB (Sweden) in 1973. First used by game hunters, firearm reflex dot sights have been in use by military forces since the mid-1980s.

In 1971, AAI Corporation (Baltimore, MD) developed a camera system for the M14 rifle. It was used in the testing of tracer ammunition the spring of that year at Fort Benning, GA. Three M14 rifles were outfitted with this camera system for this testing conducted by the U. S. Army Human Engineering Laboratory (Aberdeen Proving Ground, MD). The purpose of the gun-camera system, known as the Miss Distance Indicator (MDI), was to photograph where a projectile hit down range so that the distance and direction from the shooter's point of aim could be measured.

The MDI consisted of a stripped Minolta model 16MGS camera housed inside an aluminum box suspended from the barrel between the gas cylinder plug and the front sight. The Minolta camera was modified by adding a 75 mm lens, a cross hair reticle and a spring to counter the effects of recoil. The MDI weighed about 14 ounces and used 16 mm film. The shutter speed was set at 1/500 of a second. The F-stop (focal length divided by the lens diameter) had settings of F/8, F/11 or F/16. The camera was aligned with the rifle bore. The camera was operated by movement of an actuating rod mounted to the left side of the stock. The actuating rod was secured to the stock by brackets and a lever mounted under the bolt lock. When the rifleman pulled the trigger, the lever moved the rod forward depressing the shutter button. The camera took a photograph of the target area about 2 milliseconds before the hammer struck the firing pin. The film then advanced to the next frame in preparation for the next shot to be fired. Using the photographs, the miss distance and direction of each round was estimated by mathematical procedure. Unfortunately, the MDI system experienced two significant problems. The 75 mm lens created a focal length (distance from the film to the camera lens) too short making it hard to detect the 300 meter and 500 meter targets in the photographs. The MDI was not stable. In more than half of the shots fired, the camera moved in relation to the bore.

Harrington & Richardson built some prototype M14 rifles in 1962 known as "Guerilla guns." The Guerilla gun had a combination perforated conical flash suppressor and gas cylinder secured to the rifle by the flash suppressor nut and setscrew. The Guerilla rifle had a USGI M14 chromium plated barrel shortened to 19.3 " but it extended halfway into the conical portion of the flash suppressor. The exterior contour of the barrel chamber was turned down to reduce the weight. The overall weight of the Guerilla barrel and flash suppressor assembly was 2.6 pounds and the overall length was 20.5 ". At least one prototype Guerilla barrel made after March 1961 was cut to 16 " long. The associated gas cylinder for the 16 " barrel had a front sight dovetail base welded to it.

The Guerilla guns and other experimental M14 type rifles had serial numbers beginning with the letter X. The M14 Guerilla rifle was never adopted by the U. S. Army. At least two M14 Guerilla rifles, X-42 and X-45, were submitted to Springfield Armory in the second half of 1962 and subsequently transferred to the Springfield Armory Historical Museum on January 07, 1965. Springfield Armory tested this M14 Guerilla rifle for flash suppression in January 1963. M14 Guerilla rifle serial number X-40 was fitted with a custom made prototype Harrington & Richardson underfolding stock. Harrington & Richardson R14 serial number X-81 and M14 serial number X-40 were made with lightening cuts on the bottom of the receiver. R14 serial numbers X-81 and X-82 were made without any provision for mounting a scope.

Harrington & Richardson kept a number of the M14 Guerilla rifles until auctioned off in 1986 at the close of operations. One two digit X series serial number Harrington & Richardson Guerilla rifle, X-35, was also fitted with an under side folding stock but appears to be appears to be an M14E1 Type III folding stock. The receiver of this rifle has no scope mount boss or threaded bolt hole.

Harrington & Richardson developed a 7.62 mm NATO caliber rifle that was a hybrid between the M14 rifle and a Reising submachine gun style receiver. It weighed 8.9 pounds and had an overall length of about 41 ". Only one copy is known to exist, serial number X26. It was fitted with a modified M14 slotted fiberglass hand guard. This rifle was likely created between 1960 and 1962. The 7.62 mm NATO Reising uses the M14 gas cylinder, M14 magazine, M14 butt plate, a modified M14 flash suppressor, and a 20 " M14 modified barrel. However, the receiver, firing mechanism, select fire components and the operating rod were of totally different design from the M14.

**Table 8: Harrington & Richardson X Series Rifles**

| Serial Number | Description |
|---|---|
| X-26 | M14 Simulator .22LR caliber semi-automatic only - H&R auction |
| X-35 | R14 Experimental Rifle with folding stock - NFA Registered transferable |
| X-40 | M14 Guerilla Rifle with folding stock - NFA Registered transferable |
| X-42 | M14 Guerilla Rifle - Springfield Armory National Historic Site |
| X-45 | M14 Guerilla Rifle - Springfield Armory National Historic Site |
| X-81 | R14 Experimental Rifle - NFA Registered transferable |
| X-82 | R14 Experimental Rifle - NFA Registered transferable |
| X-85 | R14 Experimental Rifle - NFA Registered transferable |
| XX1 | M14 Simulator .22LR caliber select fire - NFA Registered transferable |

The U. S. Army Marksmanship Training Unit (USAMTU) was created on March 01, 1956 by direction of President Eisenhower. The unit was formed to raise marksmanship proficiency in the U. S. Army. Sometime between 1966 and 1970, the U. S. Army Marksmanship Training Unit came up with the idea of adding a rear lug to the M14 receiver as part of their effort to improve the accuracy of the M14 rifle. A U-shaped piece of steel, known as a lug, was welded onto the receiver underneath the heel. The stock was inletted and drilled to accept the lug and screw. A hex head screw secured the lug to the stock through its underside when the rifle was assembled. The U. S. Army Weapons Command at Rock Island Arsenal did not accept this modification out of concern from the effects of welding the receiver. Nonetheless, M1 Garand rifles with welded rear receiver lugs appeared at Camp Perry as early as 1968. M14 rifles with welded rear receiver lugs were shot competitively at Camp Perry shortly thereafter.

The U. S. AMTU also experimented with gas cylinders, operating rod guides, and operating rod spring guides for the M14 rifle. The experimental operating rod spring guides included prototypes with hollow shafts, conical shafts and a pivoting magazine catch. One experimental operating rod spring guide was about one-half inch longer than the nominal length. It worked very well in competition matches but it was difficult to install and remove for maintenance.

Other experimental AMTU items included sleeves inserted into the operating rod guide to help dampen the vibration from the movement of the operating rod. Due to drawing tolerances, the outside diameter of the operating rod can be as much as 0.012 " less than the inside diameter of the operating rod hole in the operating rod guide. The looser the fit between the two parts, the more the operating rod moves up and down as it travels back and forth.

TRW altered at least two M14 flash suppressors into a design very similar to the T37 open prong flash hider used on M1 Garand rifles. These experimental tool room TRW M14 flash suppressors were available in the surplus market in November 1972. TRW also fabricated a mock up Special Purpose Individual Weapon (SPIW) that was built around a modified M14 receiver using SPIW cartridges. The TRW mock up SPIW included an integral 40 mm grenade launcher that held three grenades. The SPIW magazine and grenade launcher subassembly were made from wood. The butt stock had a telescoping pad. The rear end of the receiver was fitted with a folding leaf sight and there was a pronged flash suppressor. The TRW mock up was sold at a January 1974 Ohio gun show to a private individual from Michigan.

**The Issue M14 Rifle**

Factory Packaging - After final testing at the factory, each M14 rifle was disassembled, cleaned, dried, lubricated and assembled according to government packaging specifications. M14 rifles were lubricated by completely dipping in lubricating oil since that was the most economical means. Originally, a sling was not included with each rifle. At some point before 1980, the packaging requirements were changed to include placing a small arms sling inside a heat-sealed bag for each of the two rifles inside the shipping box. Each rifle had a volatile corrosion inhibitor tube placed in the bore with the front of the tube bent around the muzzle to hook it into place. White polyethylene protectors for the front sight and muzzle, rear sight, and operating rod handle were placed on each rifle. A white plastic indicator placed in the chamber signified the rifle was empty of ammunition. Each M14 was then placed in a volatile corrosion inhibitor treated bag, the excess air squeezed out and the open end of the bag heat-sealed. The end of the bag was folded over the butt end of the rifle. Additionally, every shipping box contained ten in-the-wrap twenty round M14 magazines and two Basic Initial Issue (BII) kits if it contained two M14 rifles. A shipping box either contained two M14, two M14 M, two M14 NM, one M21, or one M14A1 rifle. The BII kit contained the following items: four M3 cleaning rod sections, cleaning rod carrying case, lubricant case, patch tip, bore brush, chamber brush and combination tool. Prior to 1980, the packaging instructions were revised to remove the BII kits. The packaging instructions specified thirty shipping boxes per shipping container. Each shipping container was required to have a packing list that contained the serial numbers of the rifles contained inside.

There was an exception to the standard M14 BII list of items. BII kits made up at Letterkenny Army Depot (PA) in 1968 included the selector switch and selector spring. These special M14A1 BII kits, along with some M14, M1 Garand, and M16 BII kits, were placed into M79 grenade launcher accessory pouches. These BII kits were to be shipped to the Army of the Republic of Viet Nam. About 2400 of these kits were never shipped but released as surplus to the public in 1979. Letterkenny Army Depot packaged numerous small lots of small ordnance parts during the Viet Nam War due to its well-deserved performance in such projects.

USGI M14 Rifle Costs - As of June 2007, the U. S. government unit price for each of the various M14 rifle models was as follows:

M14 JROTC (NSN 1005-00-283-7695) - $97.35
M14 M with equipment (NSN 1005-00-678-9829) - $128.00
M14 with equipment (NSN 1005-00-589-1271) - $138.00
M14 Honor Guard Semi (NSN 1005-01-494-4169) - $138.00
M14A1 with equipment (NSN 1005-00-072-5011) - $206.00
M14 NM (NSN 1005-00-678-9828) - $316.00
M14 SMUD (NSN 1005-01-255-3311) - $579.00
M14 DMR (NSN 1005-01-458-6235) - $1495.00
XM21 and M21 (NSN 1005-00-179-0300) - $1278.00
Mk 14 Mod 0 (NSN 1005-01-525-7718) - $2400.00
Mk 14 Mod 0 (NSN 1005-01-531-7324) - $3361.30

The M39 EMR (NSN 1005-01-553-5196) unit price in October 2008 was $3,930.17.

Receiving the M14 - When the new-in-box M14 rifles were received by the Army and Marine Corps, oil was present in the gas cylinders because of the factory lubrication. Thus, the U. S. Marine Corps issued Technical Instruction TI-02648A-15/6 to deal with the problem. This Technical Instruction references U. S. Army TM 9-1005-223-12 which requires that each M14 rifle to be field stripped, cleaned, and lubricated prior to firing. The gas cylinder, gas piston and gas cylinder plug should be thoroughly cleaned and dried the first time the rifle is cleaned.

In the U. S. military, the selector shaft lock was installed on most M14 rifles so that only semi-automatic fire could be employed. However, the Table of Organization for the U. S. Marine Corps required three automatic riflemen per rifle squad when the M14 was the issue rifle. In Viet Nam, U. S. Marine Corps units such as the 1st Marine Division 1st Reconnaissance Battalion and the Combined Action Platoons (CAP) were equipped with selector switches on their M14 rifles in Viet Nam. Automatic fire was used in ambush situations and by the patrol point man when making enemy contact.

Reliability - Reliability of a weapons system is a timeless characteristic of paramount importance. Military personnel engaged in combat will not trade the reliability of a weapon for anything, including weight. The weight of the rifle is not considered a burden but a life sustaining tool. That tool must function when needed. The M14 rifle has proven itself trustworthy in many places and in many climates.

The M14 rifle was tested for sustained fire in 1960 at Fort Benning, GA. In particular, one M14 rifle was fired continuously at a rate of sixty rounds per minute for 3080 rounds. The test ended when the chambered rounds started pre-igniting because of the hot barrel. The barrel never failed to stabilize the exiting bullets. The front end of the stock and the hand guard eventually burst into flames but the rifle continued to fire. At Fort Benning, the M14 rifle was found capable of firing 600 rounds in heavy rainfall without any malfunctions.

The U. S. Army Infantry Board conducted an extensive small arms comparison test from June to November 1965 at Fort Benning, GA. The study examined all aspects of the operation and maintenance of several rifles, carbines, automatic rifles and machine guns including the M14, M14E2, M60, HK33, AR18, Stoner 63 and two M16 type models.

In the comparison study, 100 M14 rifles were fired for a total of 445,268 rounds but there were only a total of 313 malfunctions. That is an average of one malfunction per 1,423 rounds. The most common malfunction experienced was a failure to feed which occurred 200 times or once every 2,221 rounds. The next most frequent malfunction was a failure of the bolt to close, 29 times or once every 15,354 rounds fired. These 100 M14 rifles had the following parts fail, collectively: extractor left the bolt - 4, bolt roller broke or cracked - 8, extractor spring plunger broke - 1, extractor broke - 3, ejector broke - 1, firing pin broke - 3, gas cylinder cracked - 2, operating rod spring broke - 1, gas piston burred - 1, M62 cartridge case rupture - 4, hand guard assembly cracked - 1, stock cracked and charred - 6, gas cylinder plug cracked - 1, connector lock pin lost - 2, rear sight cover cracked - 1, front sight guard cracked -1, flash suppressor setscrew loosened or lost - 4, rear sight pinion assembly stripped - 2. Adding together all malfunctions and instances of damaged parts, the M14 rifles experienced a problem once every 1,345 rounds on average. Out of a total of 331 instances of malfunctions and damaged parts, immediate action by the operator solved the problem 261 times. Only 50 times out of the trigger being pulled 445,268 times, an average of once every 8,905 rounds, did a M14 go down for repair. During the testing, each weapon was field stripped, cleaned and lubricated on a daily basis. A weekly detail cleaning was performed as the testing permitted. Of the seven rifles and carbines tested, the M14 had the lowest rate of malfunctions and damaged parts.

The M14E2 experienced a similar rate of malfunction, 74 instances over a total of 107,287 rounds fired for an average of one per 1,450 rounds. The most common type of failure for the M14E2 was failure to extract. This occurred at a rate of once every 5,109 rounds. During assault exercises, soldiers with the M14E2 occasionally observed the front bottom side of the M14E2 stock burst into flames after firing 200 rounds in three round bursts. The soldiers were still able to operate the weapon by grasping the vertical fore grip but it caused some distraction. Among the fifteen M14E2 rifles tested, the following parts failures were noted: operating rod spring broke - 1, cartridge broke off in chamber during extraction - 2, broken jaws on M2 bipod - 3, burnt stocks - 3, cracked stock - 1, shoulder rest spring broke - 1, muzzle stabilizer fell off - 5, and vertical fore grip snapped off while trying to free the muzzle stabilizer - 1.

In January 1968, the U. S. Department of Defense Weapon Systems Evaluation Group (WSEG) tested the reliability of the M14 and M16A1 rifles at Fort Sherman in Panama under field conditions designed to simulate the environment faced by American troops in the Republic of Viet Nam at the time. Both rifles were tested in beach, swamp, rain forest and dry climate conditions by a total of 302 U. S. Marines divided into four platoons. The M14 rifles and M62 tracer and M80 ball ammunition were included in the test as a control against three versions of the M16A1 and various 5.56 mm ammunition compositions. The M14 rifles were shot alternately in semi-automatic and automatic mode. Each M14 rifle was shot with magazines loaded to twenty cartridges except for one in each of the sixteen squads was fired with magazines filled with eighteen rounds. Each of the M14 rifles used in the test was shot approximately 5,700 rounds with only cleaning at noon each of the twelve days of firing.

The WSEG test recorded the following Mean Rounds to First Malfunction for the M14 rifle in each of the four field environments: 1) 1,039 for salt water, spray and sand 2) 1,248 for swamp water and mud 3) 707 for rain forest and 4) 952 for uplands and dust. When the M14 rifle did malfunction, 42 % of the time it was on the first or second round of the magazine. The likelihood of malfunction is highest with the first two rounds in either magazine loading, eighteen or twenty cartridges. This is due to the slightly lower cyclic rate of fire with a full or nearly-full magazine. The M14 gas system does not exhaust propellant gas and carbon residue into the receiver and bolt. This lends to the reliability of the M14 design.

Safety - Designed as a military weapon, the M14 type rifle has a number of safety features that protect the operator or unintended targets from injury. Some of these features are common to other firearms while the remainder are M14 specific. In order to fire, the USGI M14 rifle must be assembled, the magazine loaded with at least one cartridge and inserted into the rifle, the hammer cocked by pulling the operating rod to the rear with at least 15.31 pounds of force, the bolt stripping a cartridge from the magazine and fully closing into battery, the safety disengaged and the operator pulling the trigger to the rear with sufficient force, typically 5.5 to 7.5 pounds, before the bullet will exit the barrel. Several *deliberate* acts by a human operator must be taken to cause the M14 type rifle to discharge a bullet.

The receiver bridge with its camming surface and cutout work together with the tang of the firing pin to: 1) mechanically retract the firing pin when the bolt rotates to unlock after firing, preventing a "sticky", rusted or gummed-up firing pin from remaining in the forward position during the rest of the cycle of operation and 2) prevent the firing pin from slamming forward when the round being loaded stops in the chamber, preventing a "slam fire" while the bolt is still unlocked. The firing pin can travel forward through the bridge cutout only after the bolt has fully closed and locked. Additionally, the hammer cocking machining cut on the rear end of the bolt prevents the hammer from striking the firing pin until the bolt lugs have rotated into locked position.

The sear engages the hammer to prevent firing until sufficient force is applied to the trigger by the operator. The hammer spring and hammer work together to prevent the primer from blowing out of the cartridge case once the gunpowder has ignited. An easily operated safety can be engaged to prevent any rearward movement of the trigger and any forward motion of the hammer whatsoever. With the safety engaged, the trigger is disengaged from the hammer and the trigger is limited in its rearward travel. The engaged safety rests on top of the hammer left side ridge, positively preventing a strike on the firing pin. The position of the safety can be easily discerned by touch alone. This is especially useful in the dark. The trigger guard aids in unintended discharge of the rifle by limiting access to the trigger. The two stage trigger pull gives the operator sufficient pause for getting the sights on target or for choosing not to engage at the last twinkling.

When the gunpowder inside the cartridge case ignites, the hot propellant gas generates a chamber pressure of 50,000 psi or more. The chamber pressure is prevented from venting into the operator’s face by the locking action of the bolt and receiver lugs. As the gas pressure acts on the gas system, the operating rod will move about 5/64 " to the rear before engaging the bolt to rotate and unlock. This allows sufficient time for propellant gas pressure inside the barrel to drop to ambient pressure. The cutoff and expansion gas system of the M14 develops less gas cylinder pressure than the impingement gas system of the M1. From a safety standpoint, this results in less force acting on the operating rod as it moves to the rear. Less force pushing on the operating rod means softer impact on the receiver by the bolt. The "hump" of the operating rod, located just in front of the handle, serves to knock the ejected cartridge case to the right and forward of the shooter, typically one o’clock to two o’clock as viewed looking down range along the barrel. This ejection pattern minimizes the risk from hot cartridge brass to the operator and adjacent shooters. The bolt lock will engage the bolt holding it to the rear after the last cartridge has been ejected from the rifle. This feature is a visual indicator that the rifle is out of ammunition.

Should several things go terribly wrong and the rifle fires before the bolt lugs have engaged the receiver, the propellant gas will vent forward through the barrel and downward into the magazine well and outward through the gap between the receiver and the stock. The rearward movement of the bolt is controlled by the force of the operating rod spring and the receiver safety lug. As the bolt moves rearward it is forced downward by the slope of the receiver heel. Some commercial M14 type receivers have well defined bolt raceways aft of the receiver bridge which further aids the downward movement of the bolt upon opening.

The hand guard prevents operator injury from the hot barrel. The noise of the muzzle blast is transmitted through the air but also by vibration to the skull through the shooter's cheek weld. This is known as bone conduction of sound waves. The operator's skull receives lesser bone conduction because of the foam filled USGI M14 synthetic stock. Note that this is no substitute though for proper hearing protection. Automatic fire is only possible with M14 rifles built with functional select fire components and then only when the selector switch has been turned to the automatic fire position. Otherwise, the rifle will only discharge once for each rearward pull of the trigger.

Storage Racks - When not in use, the M14 rifle was securely stowed in a small arms storage rack. There were two types of locked storage racks for the M14 rifle, floor mounted and wall mounted. Two floor mounted rack models were available, the M1A1 (FSN 1095-776-0043) and the M3A1 (FSN 1095-776-0044). Both models were constructed of wood and could store twenty M14 or M1 Garand rifles. Floor mounted storage racks were installed in barracks. The wall mounted storage rack, M11 (FSN 1095-897-8755), was made of 6061 T6 alloy aluminum, painted green and held twenty M14 rifles.

Weapons Cards - Troops issued M14 rifles were given a wallet-sized “weapons card.” The card was known as a Weapon Custody Receipt (Form 4430) in the U. S. Navy and U. S. Marine Corps. Form 4430 was created in June 1961 and later revised in March 1976. The original Form 4430 contained the following information: organization, person to whom the weapon was issued to and his Service Number, signature and grade of the Commanding Officer, weapon description, weapon serial number and the storage rack number. The March 1976 revision replaced the Service Number with the serviceman's Social Security Number and added a Privacy Act Statement on one side. Accordingly, “THIS FORM IS USED TO DETERMINE WHO HAS CUSTODY OF WEAPON AND TO ESTABLISH RESPONSIBILITY FOR CONTROL, CARE AND SAFEKEEPING.”

The weapons card in the U. S. Army was DA Form 3749 Equipment Receipt. The DA Form 3749 was promulgated on August 01, 1971 and later revised in January 1982. The DA Form 3749 was still in use by the U. S. Army 1st Infantry Division as late as May 2005 for issuance of small arms. When a serviceman went to retrieve his M14 rifle he gave the Weapon Custody Receipt or “weapons card” to the armorer. The armorer issued the rifle to the serviceman and placed his “weapons card” in the bottom of the rack where the individual's rifle was stored. Upon return of the M14 rifle to the arms storage room, the service member was given back his weapons card.

Firing Data Cards - A small form, a firing data card, was often pasted by individual soldiers to the inside surface of the butt plate flapper. This card was used to record the battle sight zero at 100 yard increments out to 500 yards for the soldier's M14 rifle. This card was obtained by cutting out from a page of FM 23-71 Rifle Marksmanship Course Trainfire 1. FM 23-71 was published by the U. S. Army in September 1957.

Training Aids – As with other small arms, the U. S. Army and U. S. Marine Corps used training aids to instruct servicemen in the operation and maintenance of the M14 rifle. These training aids were most often used in U. S. Marine Corps recruit and U. S. Army basic and advanced training. U. S. Marine Corps Junior ROTC Units have also used some of the training aids discussed below. After Raritan Arsenal closed in 1963, training aids were stored, issued and maintained by regional facilities such as Fort Jackson (SC) and Fort Benning.

The U. S. Army produced training film T.F. 9 2970 in 1960 on the operation and cycle of functioning of the M14 Rifle. The twenty-seven minute black and white film was titled *U. S. RIFLE, CAL. 7.62 MM M-14*. The M14 and M14A1 were featured in *Weapons of the Infantry*, a twenty minute training film in color produced in 1967 by the U. S. Army. This film consisted of live fire demonstrations of the infantry weapons of time, including the M14 and M14A1. The narrator states the capabilities for each weapon throughout the film. The U. S. Marine Corps produced a thirty minute color training film, *The Rifle Basic Marksmanship Series,* for classroom instruction of recruits. It was filmed in 1970 at MCRD Parris Island (SC). The film covered the principles of marksmanship, shooting positions and zeroing of the M14 rifle. It also featured short clips of combat footage of the M14 in use in the Republic of Viet Nam at the beginning of the film.

Cardboard M15 sighting devices were used in classroom instruction to teach soldiers and Marines proper M14 rifle sight alignment and sight picture. The U. S. Army had a chart (GTA 21-2-10 dated June 1971) to instruct soldiers on how lay out the individual combat equipment, including the M14 or M16 rifle, for inspection in the field.

Cloth and heavy paper training mats with the outlines of M14 parts printed with contrasting color were used as well to teach field stripping and assembly. The U. S. Marine Corps used a cloth training mat that had a green color background and yellow print outlines of M14 parts in recruit classrooms at MCRD San Diego in 1971. Fort Benning produced a M14 parts disassembly chart in July 1963.

A two-to-one scale training mock up of the M14 was produced by two different contractors with some slight differences between the two models. The mock up M14 had its own carrying case that doubled as a presentation stand. A disassembly mat, thirty mock up ammunition rounds, a wire basket and a rubber catch mat were included as part of this training aid. The wire basket and rubber mat were used to catch the mock rounds of ammunition as the cycle of operation was demonstrated. Classified as Device 3F44, the mock M14 rifle had exterior areas cut away in places to illustrate the function of the moving parts. The 3F44 device could be field stripped and the mock cartridges cycled in both semi-automatic and automatic modes just like a M14 rifle. The 3F44 device was required to be built well enough to withstand disassembly and assembly twenty times a week for a period of five years and not be adversely affected in temperatures ranging from - 65 degrees to 165 degrees Fahrenheit or relative humidity as high as 95 %. One mock double size M14 rifle is on display at the Stone Bay Ranges Armory inside Marine Corps Base Camp Lejeune (NC).

In 1962, American Research and Manufacturing Corporation produced a pair of animated transparencies that demonstrated the gas system, bolt and firing mechanism operation of the M14 rifle. The Federal Stock Numbers for these two devices were 6910-708-2379 for the Gas System transparency and 6910-708-9720 for the Operating Group transparency. These transparencies were used by the U. S. Marine Corps.

The November 24, 1972 issue of *Life* magazine ran a story on Marine Corps boot camp at Parris Island, SC. In the story, are photographs of Marine recruits training with skeletal metal castings shaped in the form of M14 rifles. The *Life* article refers to these training aids as mock weapons.

Mr. Banford R. Hill (then of Portland, OR) in 1990 patented a video target training apparatus for the M14 rifle. A simulator device resembling the physical appearance of a M14 rifle was connected to a computer, a camera and two video monitor. The target image, as viewed by the user, was reflected by optical lenses to the camera and then fed to the computer and to two video monitors. The computer processed the target image as viewed by the trainee and the theoretical impact of the round(s) fired. One monitor displayed the target image as seen by the trainee and the other monitor gave a graphical display of where the "shot" landed on the target. The operator could make windage and elevation adjustments on the simulator rifle resulting in change of "bullet" impact on the target image. The training simulator was activated by a trainee pushing it against a target image. The trainee lined up the sights with the target, hopefully using proper sight alignment and sight picture, and pulled the trigger. When the trigger was pulled, a plunger connected to the target pushed back against the simulator rifle to replicate rifle recoil and recock the trigger. The trainee also heard recorded gunfire noise when he pulled the trigger.

**The M14 Rifle in Overhaul**

As deemed by appropriate authority, the U. S. Army overhauled rack grade M14 rifles at depot facilities, e.g., Anniston Army Depot in October and December 1983. If a USGI M14 rifle has been through overhaul, the Army depot performing the work and the month and date it was done will be identified on the right side of the receiver under the operating rod rail, e.g., ANAD 12-83.

The engraved circle or letter O found on some M14 receiver heels means that rifles so marked went through depot level overhaul by the U. S. Marine Corps. Depot armorers at the Marine Corps Logistics Bases (then Depots of Supplies) Barstow, CA and Albany, GA marked overhauled M1 Garand rifles on the flat surface behind the rear sight with O-65, O-66, and O-67. The two digit number in the marking referred to the calendar year of the overhaul, e.g., 67 meant 1967. The practice was continued with depot overhaul of M14 rifles. M14 rifles overhauled by the U. S. Marine Corps were marked O-69 in 1969. By at least 1970, the marking was changed to a four alphanumeric character code, e.g., OB-70. The second letter in the code stood for the depot which performed the work. By similarly marking the M14 receiver heel with the letter O, the rifle would not require disassembly to identify it as an overhauled unit.

Some of the testing for overhauled M14 rifles is briefly described as follows:

Functioning – With a full twenty round magazine, each rifle was fired with five rounds in semi-automatic then one burst of three to five rounds and finished by emptying the magazine with one last pull of the trigger. During the last pull of the trigger, the cyclic rate of the rifle was measured. The cyclic rate requirement was within the range of 650 to 780 rounds per minute. After 100 consecutive rifles passed the cyclic rate of fire test, then every tenth rifle was tested to determine the cyclic rate.

Targeting and Accuracy – Sample M14 rifles were placed into a test stand, loaded with M59 or M80 ball ammunition and five shots were fired at targets at a distance of 1000 inches (27.78 yards). The five shots had to group within a 1.8 " diameter circle.

Endurance – One of every 500 rifles was subjected to a 1000 round endurance test. The first series of 100 rounds was shot in semi-automatic. The second series was fired in five rounds bursts in automatic. The third series was a full magazine dump. The barrel was allowed to cool to ambient after each series of 100 rounds. This set of series was repeated three times then the last 100 rounds were fired by emptying each of five fully loaded magazines with one pull of the trigger for each magazine. No cleaning of the gas system was allowed during the endurance test. No more than four malfunctions total were allowed for passing the endurance test. Also, there were limits on the number of specific types of malfunction: 1) failure to feed – two 2) bolt failed to lock – one 3) failure to fire – one 4) pierced primer – zero 5) failure to extract – two 6) failure to eject – three 7) failure to fire semi-automatic – zero 8) selector operation caused firing – zero and 9) firing not in accordance with the selector switch setting – zero.

Additional Testing – All parts were examined for proper fit, function, condition, and finish. The minimum headspace was 1.6355 " and the maximum, 1.6415 ". However, the overhaul procedure specified that every effort be made to keep the maximum headspace to no more than 1.6375 " to maximize barrel life (with 7.62 x 51 mm NATO ammunition).

The trigger pull had to be free from creep and greater than 4 ½ pounds but no more than 7 ½ pounds. The following parts were replaced without regard to condition: ejector, ejector spring, extractor spring and plunger, magazine latch spring, operating rod spring, hammer spring and bolt lock spring. Wood or slotted fiberglass hand guards were replaced with solid fiberglass hand guards. Non-plated firing pins were replaced with chromium plated firing pins. Early style extractors were replaced with late (1965 design) style extractors. Any part marked with N M was removed and replaced. Both styles of operating rod spring guides and gas cylinders were acceptable for service. Barrels with throat erosion readings greater than 5 required replacement. The gas cylinder plug on factory built M14 NM and overhauled M14 rifles was torqued to 13 to 17 foot-pounds force. Failure to fall within specified limits resulted in rejection and subsequent rework of the rifle.

**M14 in Service with the U. S. Army and U. S. Marine Corps**

U. S. Army - In the U. S. Army infantry squad of the early 1960s, the M14 rifle was standard issue. Each infantry squad had two automatic riflemen, two grenadiers and six riflemen. The 101st Airborne Division was the first Army division to be equipped with the M14 rifle. Delivery of the M14 rifle to this unit began in January 1960. U. S. Army troops in Berlin, West Germany were armed with the M14 rifle by no later than early September 1961. The M14 rifle was issued to all U. S. combat units in western Europe by October 01, 1961. By 1963, the M14 had been issued to all U. S. Army, Navy and Marine Corps units so authorized.

In the 1960s, U. S. Army infantry recruits spent much of their time in basic training with the M14 rifle. The Army recruit used the M14 in drill and ceremonies, marksmanship training, field marches, bivouac, bayonet training, infiltration and obstacle courses, guard duty and small unit tactics training.

In 1960, the U. S. Army infantry rifle squad consisted of twelve soldiers equipped with the M14. In 1962, the Table of Organization and Equipment (TOE) for the rifle squad was changed to 10 soldiers and then a year later to 11 men. In all three cases, the rifle squad was authorized two automatic riflemen. The automatic rifleman was issued the M14 (Modified) rifle until the M14E2 was fielded in 1964. The 1963 TOE remained in effect until 1967 when the U. S. Army adopted the M16A1 rifle.

There were U. S. Army infantry units that used the M14 rifle in the Republic of Viet Nam. For instance, the U. S. Army 1st Infantry Division deployed to the Republic of Viet Nam in July 1965 with its soldiers bearing the M14. The 1st Infantry Division was equipped with M14 rifles on November 19, 1965 during combat operations at Lai Khe in Binh Duong province.

The soldier of the 1960s period carried his M14 magazines using M1956 Lightweight Load Carrying Equipment (LCE). This equipment was introduced in 1956 except the small arms ammunition case came out a year later. The M1956 LCE replaced the M1910 wire hook fasteners with slide clip fasteners and metal canteen with a polyethylene model. The slide clip fastener was patented in 1959. It would later be known as the ALICE clip although it was introduced with the M1956 LCE system. The slide clip fastener was a lightweight, strong, quiet, reliable and durable means of attaching equipment pouches and packs to a load bearing belt. The slide clip fastener could be operated with one hand and it was inexpensive to manufacture. The standard M1956 components consisted of canvas material equipment belt, load bearing suspenders, butt pack, ammunition cases, one quart canteen with cover, shovel carrier, sleeping bag carrier, and small pouches for first aid items and compass.

Development of night vision rifle scopes for military purposes was underway by 1960. Raytheon produced the T-1 infrared rifle scope that year. The AN/PAS-4 infrared scope was mounted on a M14 rifle in 1964 and 1965 for orientation of U. S. Army recruits in basic training at Fort Dix (NJ) and Fort Jackson (SC). The AN/PAS-4 equipped M14 rifle also saw service in the Republic of Viet Nam with U. S. and South Vietnamese troops but primarily in a training role. It had an effective range of 300 yards. The AN/PAS-4 weighed about 6 pounds and the belt carried battery for it weighed about 7 pounds. Two contractors supplied the AN/PAS-4 to the U. S. Army, Polan Industries (220 Eighth Street Huntington, WV) and Varo, Inc. (Garland, TX). The BB-429/U sintered-plate nickel-cadmium batteries for the AN/PAS-4 scope were made by Sonotone Corporation (Elmsford, NY).

Ammunition cases are commonly referred to as magazine pouches. The M1956 LCE had at least four variations of the small arm ammunition case (FSN 8465-647-0852). Beginning by September 1959, three versions were made before 1968 and the fourth kind was produced in 1968. A 1960 vintage example was marked as follows inside the flap, top to bottom: first line - POUCH, SMALL ARMS, AMMUNITION, UNIVERSAL second line FSN 8465-647-0852 third line DA 36 243 QM (CTM) 5558-E-61 fourth line AUG 1960. Another M14 magazine pouch made after 1960 was marked as follows inside the flap: top line - CASE, SMALL ARMS, AMMUNITION middle line - DSA-1-8682 bottom line - 8465-647-0852.

The M1956 small arms ammunition cases made before 1968 could hold two M14 twenty round magazines or four M1 Carbine thirty round magazines or six M1 Rifle enbloc clips. The 1968 production M1956 ammunition cases were designed to hold M16 twenty round magazines. The cases were secured with a canvas tab and metal loop arrangement. Only the first of the four versions of the M1956 pouch were made with a front side steel plate inside the fabric. Magazines were inserted top down into the pouches for a number of reasons: 1) faster reloading 2) to help keep dirt and water from collecting in the magazine and 3) minimize the potential for bending of the magazine feed lips.

The U. S. Army upgraded to the M1967 Modernized Load Carrying Equipment (MLCE) system in 1968 to better resist the effects of jungle warfare. The MLCE components were made from nylon. The equipment belt and magazine pouches were given quick release plastic buckles. The M1967 all-metal construction shovel folded into three parts and was stowed inside a plastic case. The M1967 magazine pouches were designed for the M16 rifle and were produced from 1970 to 1972, possibly later. However, in 1970, some M1967 nylon M14 magazine pouches with quick release plastic buckles were produced. These magazine pouches also held two M14 twenty round magazines. Individual load carrying equipment was further modernized in 1974 with the introduction of All Purpose Lightweight Individual Carrying Equipment (ALICE).

In 1957, the U. S. Air Force was the only military branch that did not welcome the M14 rifle. The U. S. Air Force retained its Army supplied M2 carbines in lieu of the heavier M14 rifle. In April 1961, Dr. Carten, the U. S. Army Chief of Small Arms Research and Development recommended the Air Force consider the folding stock M14E1 rifle for its needs. Instead, U. S. Air Force Deputy Chief of Staff General Curtis LeMay continued to lobby for congressional funding to purchase civilian models of the yet-to-be adopted M16 rifle. His lobbying included a personal meeting with President John F. Kennedy in December 1961 then as U. S. Air Force Chief of Staff. His request was denied.

On his third request, General Curtis LeMay was able to obtain funds in May 1962 for the first of several Air Force orders for civilian manufacture M16 type rifles. The U. S. Air Force adopted the .223 Remington caliber rifle in May 1962 as the M16 to replace its M2 Carbines which the Army no longer stocked parts for. Later, the U. S. Air Force would use the match conditioned M14 rifle for competition matches. Eventually, the U. S. Air Force equipped Explosives Ordnance Disposal and Special Operations personnel with the M14 SMUD rifle.

Although the U. S. Army Ordnance Corps had originally intended to replace the M14 with the Special Purpose Individual Weapon (SPIW), the M16 rifle was brought into service as the standard infantry rifle for the U. S. Army and U. S. Marine Corps by the mid-1960s. Consequently, the M14 rifle was phased out among Army and Marine Corps infantry units as M16 rifles were received. For example, the M14 rifle was replaced by June 1966 in the 22$^{nd}$ Infantry Regiment 4$^{th}$ Infantry Division of the U. S. Army. Yet, Artillery Forward Observers in the Army's 3$^{rd}$ Howitzer Battalion 6$^{th}$ Artillery Regiment carried M14 rifles in the field through at least the end of October 1966. U. S. Army Military Police on duty in the streets of Saigon, Republic of Viet Nam during the November 01, 1966 National Day Parade carried M14 rifles. U. S. Army Chief of Staff General Harold K. Johnson recommended in correspondence to Secretary of Defense Robert McNamara in December 1966 that the M14 rifle should be replaced and only the XM16E1 (later classified as M16A1) should be purchased for infantry rifles. The M16A1 officially replaced the M14 as the Standard A rifle in the U. S. Army on February 28, 1967.

However, the transition was not quickly implemented. The U. S. Army was still using the M14 rifle in combat as late as January 1968 in the Republic of Viet Nam. Soldiers of the Army 40$^{th}$ Signal Battalion stationed around Phu Tai, Binh Dinh defended themselves with the M14 rifle when attacked by the Viet Cong during the Tet Offensive, which began the night of January 30-31, 1968. The soldiers of the U. S. Army 2nd Battalion 94th Field Artillery 108th Artillery Group at Camp J. J. Carroll, near Cam Lo, Quang Tri Province, did not exchange their M14 rifles for the M16 until May 1968. Signal Corps and Aviation units typically carried M14 rifles into combat in 1968 and 1969. M14 rifles were mixed in with M16A1 rifles among troops of the U. S. Army 1st Cavalry Division in the Republic of Viet Nam as late as August 1970.

The U. S. Army reported a total loss of 14,470 M14 and three M14A1 rifles in the Republic of Viet Nam between July 01, 1967 and June 30, 1970. Of that number, 1,038 M14 rifles and the three M14A1 rifles were losses due to combat action. M14 rifles were lost in battle as late as May 1970, if not later, according to available U. S. Army records. For example, two M14 rifles, serial numbers 1239005 and 1299813, were destroyed by direct fire in daylight when the members of the 1st Battalion 5th Infantry Regiment (Mechanized) 25th Infantry Division, were engaged in heavy contact with the enemy in jungle terrain on May 09, 1970 in Operation Bold Lancer.

These equipment loss records, declassified in 1977, include the unit name, date of loss, cause of loss, the rifle serial number and situation details such as visibility, weather, type of mission, level of enemy contact, terrain, etc. A report was submitted for each M14 rifle lost no matter the cause. In a lot of cases, the weather and terrain information is omitted but the unit names, type of mission, date of loss and rifle serial numbers confirm that the M14 rifle was very much in use in combat until 1970. U. S. Army equipment loss reports for the fiscal years 1968, 1969 and 1970 show that the following major commands lost M14 rifles due to combat action in the Republic of Viet Nam: 1st Aviation Brigade, 1st Cavalry Division, 1st Infantry Division, 9th Infantry Division, 12th Aviation Group, 17th Aviation Group, 23rd Artillery Group, 23rd Infantry Division, 25th Infantry Division, 18th Engineering Brigade, 18th Military Police Brigade, 20th Engineering Brigade, 101st Airborne Division, 108th Artillery Group, 164th Aviation Group and the 199th Infantry Brigade.

Even the M14A1 was carried into combat as late as 1968 in the Republic of Viet Nam. M14A1 rifle serial number 1274598, a Winchester, was lost in combat on May 07, 1968 due to direct fire. The Cavalry unit involved, Troop D 17th Troop 199th Infantry Brigade, was on a Recon in Force mission that day. The M14A1 was lost during heavy contact with the enemy in jungle terrain in the III Corps Tactical Zone.

The weekend of October 21 and 22, 1967 was an ugly scene in Washington, DC. Over 70,000 anti-war protestors gathered to demonstrate against American military involvement in the war in the Republic of Viet Nam. The U. S. government called up 6,000 federal police and U. S. Army Military Police to maintain order in the capitol. On Saturday, the initial rally at the Lincoln Memorial was held peacefully. Towards the evening though, chaos erupted. Nearly 5,000 demonstrators left the rally and marched towards the Pentagon. The demonstrators arrived to find barricades and U. S. Army Military Police armed with fixed bayonets on M14 rifles but no magazines inserted into them. For the next twelve hours, a full blown riot raged outside the Pentagon. In a twist of historic irony, Secretary of Defense Robert S. McNamara observed the bedlam first hand through a window inside the Pentagon. The rifle he thought not worthy of funding four years earlier was the soldiers' tool that his safety depended upon that night. At about midnight on Saturday, the Military Police counterattacked against the American citizens surrounding the Pentagon. Many of the demonstrators were beaten and arrested. By the next evening, the protest was over.

On April 04, 1968, Rev. Dr. Martin Luther King, Jr. was murdered. Following this tragic event, there were many protests, marches, rallies and riots during the spring and summer of 1968. For example, the downtown areas of several major U. S. cities sustained major damage in August 1968 from fires set by rioters protesting the death of Dr. King. U. S. Army National Guard troops armed with M14 rifles were called into control the riots in these cities. The U. S. Army 2$^{nd}$ and 7$^{th}$ Infantry Divisions stationed in the Republic of Korea were still armed with the M14 rifle in 1968. The 2$^{nd}$ Infantry Division converted from the M14 to the M16A1 starting in late 1968 and finishing in May 1970. During this period, the 2$^{nd}$ Division inspected, packaged and turned in over 7,000 M14 rifles. The M16A1 rifle was shipped to U. S. Army units in Europe beginning in May 1970 to effect replacement of the M14.

On October 03, 1993, U. S. military forces executed Operation Gothic Serpent in Mogadishu, Somalia. During the mission, U. S. Army Special Forces Delta operators Master Sergeant Gary Gordon and Sergeant First Class Randall Shughart volunteered to leave the relative safety of the helicopter they were aboard to provide security for the crew of the second downed Black Hawk UH-60 helicopter, *Super Six-Four*, of Task Force Ranger. Gordon and Shughart fended off the hostile Somalis until all small arms ammunition had been expended and they were fatally wounded. Their selfless actions saved the life of the pilot, Chief Warrant Officer Four Michael J. Durant. Both men were awarded the Medal Of Honor posthumously.

Sergeant First Class Shughart routinely carried the M14 in Somalia. On October 03, 1993, his M14 rifle was equipped with a leather sling and an Aimpoint 7000 dot sight. The stock was painted with a desert camouflage pattern. Before landing on the ground to assist *Super Six-Four*, Sergeant First Class Shughart had provided fire from his M14 rifle on the target building and at both helicopter crash sites. The mission plan called for the two Delta operators to remain airborne. Consequently, Gordon and Shughart, did not bring extra quantities of ammunition. Shughart boarded the helicopter that afternoon with only seven twenty round M14 magazines for the M14 and a Colt Firearms M1911 as a secondary weapon. When Gordon and Shughart touched the ground at the second crash site, there was less than 140 rounds left for the M14 rifle. Nonetheless, Sergeant First Class Shughart put the M14 and the other weapons on the scene to good use. Chief

Warrant Officer Four Durant reported hearing a continuous discharge of firearms for about two minutes immediately before Sergeant First Class Shughart was fatally wounded. The weapons of both heroes were never recovered.

U. S. Marine Corps - The M14 rifle was issued to the first Marine Corps units in 1961. The conversion from the M1 Garand rifle to the M14 had been completed for the Fleet Marine Forces by late 1962. In the 1960s, the U. S. Marine Corps infantry rifle squad consisted of a squad leader and three four man fire teams. Each fire team assigned one M14 with a selector switch to the Automatic Rifleman. The U. S. Marine Corps developed its own Load Carrying Equipment in 1961.

The M1961 LCE had an equipment belt with metal snap “button” fasteners for securing ammunition pouches. The markings on one M1961 web belt read as follows: top line is the item description - BELT, INDIVIDUAL EQUIPMENT middle line is the contract number - DSA100-67-C-1041 bottom line is the Federal Stock Number 8465-823-6937. To the right of this information is the letter M signifying Medium Size. Under the letter M is the marking -2-.

The ammunition pouches were slid on to the belt then secured by snapping the “male” half of the fastener on the pouch to the “female” half of the fastener on the belt. Each M1961 magazine pouch carried one M14 twenty round magazine. In 1964, the second version of the M1961 magazine pouch was introduced. The pouch compartment and flap were made slightly longer than the original. The thought behind the M1961 LCE was that it allowed for a lower prone position. U. S. Army and U. S. Marine Corps infantry Riflemen were issued five M14 magazines and Automatic Riflemen were given eight M14 magazines. Marines carried additional ammunition in sixty round M2 bandoleers. The M1961 LCE also had a butt pack. M1956 canteen covers and shovel carriers were used by the Marines.

The U. S. Marine Corps experimented with two M14 magazine pouches known as M14H and M14-V, H for horizontal carry and V for vertical carry. These olive drab nylon pouches attached by ALICE clips held two magazines. The M14-V pouch was manufactured at some point before 1973. It was marked U.S.M.C. on the flap on the outside and POUCH M14-V on the inside. The magazines were accessed by undoing the flap and pulling vertically out of the pouch. Likewise, a single magazine was removed from the M14H pouch by pulling up on the pouch flap. The M14H pouch was marked U.S.M.C. on the outside of the pouch flap. These magazine pouches were not issued.

While the number of combat operations in the Republic of Viet Nam are too numerous to list, one frightful night in 1966 will serve as witness to the value of the M14. Led by Gunnery Sergeant Jimmie E. Howard, sixteen Marines and two Navy corpsmen (medics) from First Platoon C Company 1$^{st}$ Battalion 5$^{th}$ Marines 1$^{st}$ Marine Division formed up as a reconnaissance patrol on June 13, 1966. They were delivered by helicopter to Hill 488 in the Que Son Valley of Quang Tin Province, Republic of Viet Nam that evening. The

Marines and sailors set up an observation post at the top of the hill. During the next two days, the unit called in artillery strikes and aerial bombing runs on Viet Cong units in Que Son Valley. The Marines were equipped with select fire capable M14 rifles, one M79 40 mm grenade launcher and a total load of about 3,000 rounds of 7.62x51 mm NATO ammunition. The two Navy corpsmen carried .45 ACP pistols. Each man also carried a minimum of four fragmentation hand grenades.

By the third evening, June 15, 1966, the enemy had figured out where the source of their trouble was located and had determined to do something about it. A battalion sized force of 450 North Vietnamese Army and Viet Cong soldiers began the attack of Hill 488 at about 11:00 PM in an all-out attempt to annihilate the eighteen Americans. When hostilities had ended at about 9:30 AM the next morning, this small unit of Marines and sailors had become the most highly decorated military unit in American history. The unit had expended all hand grenades and 40 mm projectiles and had less than an estimated 200 rounds of M14 rifle ammunition left by 4:00 AM on June 16. Six of the eighteen men were killed in action that night with another later dying of wounds sustained in the battle. Another five Marines were killed the morning of June 16 as part of the reaction force. The following medals were awarded to the members of Gunnery Sergeant Howard's unit as a result of the bravery shown and wounds received that night: one Medal of Honor, four Navy Crosses, thirteen Silver Stars, and eighteen Purple Hearts.

Lieutenant General Victor H. Krulak, Commanding General of Fleet Marine Force, Pacific, stated on January 02, 1967 that the Marines in the Republic of Viet Nam were switching to the M16A1 rifle. The change to the M16A1 was pushed in 1966 by Lieutenant General (later General) Lewis W. Walt, then Commanding General of the III Marine Amphibious Force and Senior Advisor for I Corps in the Republic of Viet Nam. General Walt had intended for both the M14 and the M16A1 to remain in use throughout the Corps. Marines would be trained on both rifles. The needs of the specific combat operation would determine which rifle would be fielded. However, it did not work out this way.

By February 1967, Marine Corps Base Camp Lejeune (NC), Marine Corps Schools Quantico (VA) and the Staging Battalion at Marine Corps Base Camp Pendelton (CA) had received the M16A1 rifle for testing. The M16A1, for the most part, replaced the M14 in U. S. Marine infantry units within the Republic of Viet Nam during March, April and May 1967. The Marine 3rd Reconnaissance Battalion had exchanged its M14 rifles for the M16A1 by November 1967. However, the transition period took quite a bit of time.

Apparently, not all M14 rifles had been turned in by infantry units of the U. S. Marine Corps even as late as 1968. U. S. Marine Corps film footage of the battle for Hue, Thua Thien, Republic of Viet Nam reveals Marines engaging the enemy with M14 rifles between the beginning of the Tet Offensive and the liberation of Hue four weeks later on February 26, 1968. Some U. S. Marines relied on the M14 rifle during one of the most infamous battles of the second half of the twentieth century at Khe Sanh, Quang Tri, Republic of Viet Nam. In that battle, the 26th Marine Regiment 4th Marine Division at Khe

Sanh was laid siege to from January 21 to April 14, 1968 by as many as 20,000 North Vietnamese Army soldiers. The 1st Battalion 3rd Marines 3rd Marine Division used M14 rifles alongside the M16A1 against a North Vietnamese Army Ranger Battalion north of Dong Ha, Quang Tri, Republic of Viet Nam during Operation Thor in July 1968 in a fierce five day battle leaving over 1,000 enemy dead and only five taken prisoner.

Marines assigned to Air Wing helicopter squadrons in Viet Nam held on to the M14 rifle later into the war than the rifle battalions. The M14 was still carried by Marines of UH-1 helicopter squadron VMO-3 of the 1st Marine Air Wing at Phu Bai, Thua Thien in November 1967 and the Marine Aircraft Group 13 at Chu Lai, Quang Tin in 1969. U. S. Army Signal Corps soldiers carried M14 rifles in the Republic of Viet Nam near Hue until at least May 1970 while constructing radio relay sites. The soldiers constructing the hill top sites were subject to frequent North Vietnamese Army and Viet Cong sniper fire and so needed a magazine fed rifle with sufficient range to counter the threat.

The M14 in Training and Garrison - After the war in Viet Nam, the M14 remained in use for training and barracks duty. The U. S. Army took the step in February 1968 to fully convert small arms training from the M14 to the M16A1 as supplies became available. The phase out of the M14 rifle began in Army Basic Training by no later than August 1968, e.g., Fort Dix (NJ), but was not completed until December 1969. All U. S. Army infantry training had changed over to the M16A1 rifle by March 1970. The U. S. Marine Corps issued the M14 rifle to recruits at Marine Corps Recruit Depot (MCRD) Parris Island (SC) until at least June 1973 and at MCRD San Diego (CA) until at least September 1973. Beginning with recruit training, U. S. Marines qualified with the M14 rifle each year as late as 1974, e.g., Marine Corps Base Camp Pendelton (CA) and Marine Barracks Roosevelt Roads (PR).

The 2nd Brigade 112th Armor 49th Armored Division of the Army National Guard during the second half of 1972 exchanged its M14 rifles for M16A1 rifles. Marine Corps Office Candidate School classes trained with the M14 as late as June 1974. The M14 rifle was issue equipment for Marines assigned to the 32nd Street Naval Station (San Diego, CA) until the first half of 1978. As of August 2002, the M14 rifle was still in use by aggressor forces at the U. S. Army Ranger School.

Close Order Drill and The M14 - In the 1700s, armies developed instructions for troops to handle and load weapons while in formation in the field or on the parade ground. These instructions were known as manuals of arms. Some examples are the 1764 British Army manual and the Von Steuben manual adopted by the Continental Army in 1777. Until the American Civil War, soldiers were organized in close-knit formations on the battlefield. Hence, the organized movement of troops with or without weapons came to be known as close order drill. Today, close order drill is rarely used for purposes other than or ceremonies and parade functions. However, the manual of arms command, “Fix Bayonets!”, was used on occasion by American forces in combat in the twentieth century.

In 1907, the U. S. Navy published the Landing-Force and Small Arms Instructions manual for sailors and Marines. This set of instructions covered amphibious landing operations as well as close order drill movements, use of the sword and guidon, color guard movements, and parade formations. This manual was revised in 1927 as the Landing Force Manual and yet again in November 1960 as the Landing Party Manual OPNAV P34-03. The 1960 Landing Party Manual had extensive photographs in Chapter 2 Drill and Chapter 3 Ceremonies to illustrate proper execution of close order drill movements with the M14 rifle. On May 26, 1981, the Department of the Navy issued SECNAVINST 5060.22. That instruction replaced the 1960 Landing Party Manual with the Marine Corps Drill and Ceremonies Manual NAVMC 2691 for close order drill purposes. NAVMC 2691 gives instruction on close order drill using the M16 rifle instead of the M14.

U. S. Army field manual FM 22-5 Infantry Drill Regulations was published in 1939. The title of the manual changed to Drill and Ceremonies with the June 1950 edition. It was published six more times until it was superseded by FM 3-21.5 in July 2003. The Manual of Arms for the M14A1 rifle was in the last (1986) edition of FM 22-5 but was removed with the supercession to FM 3-21.5. The M14 Manual of Arms can be found in Appendix C of the Army field manual FM 3-21.5.

The M14 after 2000 - The U. S. Army and Marine Corps have put the M14 rifle to combat use in Afghanistan, Kuwait and Iraq in support of the War on Terrorism. Program Executive Office Soldier (Fort Belvoir, VA), a subordinate agency of Department of Army Systems Coordinator, fielded a total of 5,353 M14 rifles to Army combat units between August 2002 and April 2007. In March 2003, the Fox television network news department showed video footage of a U. S. Army soldier shooting a M14 rifle using automatic fire into the window of a building during the opening days of Operation Iraqi Freedom. Select members of the following units used the M14 rifle in those countries: U. S. Army 1st Cavalry Division, 1st Infantry Division, 2nd Infantry Division, 10th Mountain Division, 25th Infantry Division, 42nd Infantry Division, 82nd Airborne Division, 101st Airborne Division and the 5th and 7th Special Forces Groups, and the U. S. Marine Corps 1st Marine Division. For example, the 1st Battalion 26th Infantry Regiment 1st Infantry Division used the M14 rifle during Operation Baton Rouge in Samarra, Iraq from September 30 to October 2, 2004. On August 17, 2007, U. S. Army soldiers from the 2nd Battalion 14th Field Artillery Regiment 2nd Brigade Combat Team 10th Mountain Division employed the M14 rifle while providing security cover during a medical civic action program in Mahmudiyah, Baghdad, Iraq. The M14 rifle offers greater range and punch than M16 variant rifles and carbines. A carbine is normally defined as a long gun with a rifled barrel that is less than 20 " long. As of May 2008, 17,062 M14 rifles were issued to U. S. military units. That number is aside from the inventory kept at Rock Island Arsenal and other depot level facilities and those rifles issued on loan to law enforcement agencies.

Modern M14 Rifle Optics - Some 82nd Airborne soldiers in 2002 had Trijicon, Inc. TA01-NSN 4x32 scopes mounted to their M14 rifles while on combat patrol in Afghanistan. U.

S. Army and Army National Guard soldiers in Iraq with M14 rifles have purchased and installed a variety of optics at their individual discretion. Optics from Aimpoint, Inc., EOTech, Inc., Leupold & Stevens, Inc., Schmidt and Bender, Inc. and Trijicon, Inc. are in use by U. S. soldiers in Iraq. The U. S. Army has issued AN/PEQ-2A and AN/PEQ-5 optics for use on M14 and Mk 14 Mod 0 rifles in Afghanistan and Iraq. The AN/PEQ-2A consists of an infrared laser and an infrared illuminator. The AN/PEQ-2A laser is effective to more than 600 meters. The AN/PEQ-5 is the visible light laser counterpart. The AN/PEQ-2A and AN/PEQ-5 optics are typically used on Mk 14 type rifles. Individual soldiers have purchased and installed Sadlak Industries, Smith Enterprise, Inc. and Springfield Armory, Inc. scope mounts on issued M14 rifles. Additionally, U. S. Army and Army National Guard battalion and company sized units being deployed to Iraq have purchased M14 accessories such as scopes, scope rings, and scope mounts with unit MPAC credit cards. For example, C Company 3rd Battalion 112th Armor Regiment 56th Brigade Combat Team 36th Infantry Division purchased and installed scope rings, Springfield Armory, Inc. scope mounts and Tasco rifle scopes on its two M14 rifles before deployment to Iraq in 2005.

Load bearing equipment in use in combat zones today is often a mixture of the government issue MOLLE system and privately purchased civilian market tactical load bearing components. Soldiers with combat service in Iraq report that it was common practice to carry an individual load of seven twenty round magazines for the M14. Ammunition resupply in these areas was often from delinking belted M240 machine gun ammunition.

In 2003, the U. S. Army added the M14 rifle to the weapons inventory of the Stryker brigades. The Designated Marksman (DM) for each squad was outfitted with a scoped M14 rifle. The choice of optics was a Leupold & Stevens, Inc. tactical rifle scope. This gave each squad the ability to cover a larger field of fire.

To help support this new infantry role the U. S. Army established a new school in February 2004 called the Squad Designated Marksman School at Camp Bullis (San Antonio, TX). The U.S. Army issued orders to a group of civilian shooters to serve as the faculty for this school for a period of two weeks. Designated as Volunteer Military Instructors, these civilians were all distinguished competition shooters and members of the Texas State Rifle Association. Two groups of forty soldiers from the U. S. Army First Cavalry Division (Fort Hood, TX) were put through a one week course on operating and maintaining the M14 rifle as the Squad Designated Marksman. The Squad Designated Marksman School at Camp Bullis was such a success that it was hosted by the 5th Army Small Arms Readiness Group in December 2004 at Fort Hood for soldiers of the 3rd Infantry Division.

In 2004, the U. S. Army National Guard 1st Battalion 69th Infantry Regiment, based in New York, teamed up with the Army National Guard 1st Battalion 156th Infantry Regiment from Louisiana to form the 256th Brigade Combat Team (BCT). The 256th BCT was deployed in Baghdad, Iraq from October 2004 to September 2005. During this deployment, the 1st Battalion 69th Infantry Regiment equipped one soldier from each ten man squad with a M14 rifle fitted with a Springfield Armory, Inc. Third Generation scope mount and Tasco rifle scope but no bayonet or USGI cleaning kit. Towards the end of the its deployment, the 1st Battalion 69th Infantry Regiment was receiving new production Check-Mate Industries twenty round magazines for its M14 rifles. Staff Sergeant John Chalker of the 1st Battalion 69th Infantry Regiment used his USGI Winchester M14 rifle with iron sights to engage the enemy while serving as the turret gunner aboard a Humvee providing security for Airport Road. Airport Road in Baghdad was dubbed the most dangerous road in the world because of the heavy number of improvised explosive devices planted and detonated by the enemy on this road. Staff Sergeant Chalker preferred to use his M14 rifle in lieu of the turret mounted M240 belt fed machine gun because he could respond faster to ambushes.

During the late summer and early fall of 2004, two U. S. Army armorers rebuilt and upgraded a batch of M14 rifles into Squad Designated Marksman rifles for the U. S. Army 10th Mountain Division. This accurizing work included unitizing the gas systems, reaming the flash suppressors, tuning the triggers, bedding the stocks and fitting the receivers with Tasco (Overland Park, KS) 10 X 40 mm scopes. In the fall of the same year, the U. S. Army National Guard 42nd Division upgraded its 108 M14 rifles in preparation for deployment to Iraq. The M14 rifles were upgraded with Sadlak Industries (Coventry, CT) steel scope mounts, Tasco 10 X 40 mm scopes, Badger Ordnance (North Kansas City, MO) scope rings, Harris bipods, Butler Creek scope covers, and BlackHawk Products Group (Norfolk, VA) cheek pads. Sadlak Industries, LLC provided instruction to the 42nd Division soldiers on installing the scope mounts. The 42nd Division, along with its M14 rifles, deployed to Iraq in early 2005. The M14 rifles are used in the 42nd Division's Long Range Surveillance detachment.

Staff Sergeant Scott Lawson carried and put to good use a scoped M14 rifle during heavy combat in Fallujah, Iraq in November 2004 as a member of the weapons platoon in A Company 2nd Battalion 2nd Infantry Regiment 1st Infantry Division. A Company 1st Battalion 22nd Infantry Regiment of the U. S. Army 4th Infantry Division left Fort Hood, TX left in November 2005 for deployment to Iraq. Sergeant Cody Hoefer of A Company was issued a M14 rifle in a wood stock along with his M16 style carbine for duty in Iraq. In January 2007, the U. S. Army National Guard 128th Military Police Company employed M14 rifles in countersniper duty in Muqdadiyah, Iraq. The M14 rifle is still very much a useful tool on the modern battlefield and is far from obsolescence.

**The M14 in the U. S. Navy**

U. S. Navy ships inventory the M14 rifle for several purposes. M14 rifles are maintained by Gunner's Mates on surface ships and Missile Technicians or Fire Control Technicians on submarines. The M14 rifle is used to shoot a line (rope for landlubbers) from one ship to another during underway replenishment, to arm the Shark Watch during swim call, to repel boarders, for use in burial-at-sea ceremonies, and to arm the security detail during loading and off loading of nuclear weapons on submarines.

Navy SEAL Team 1 operating out of the Rung Sat Special Zone in the Republic of Viet Nam was equipped with the M14 rifle until November 1967. Since the American involvement in the Republic of Viet Nam, U. S. Navy SEAL Teams have equipped themselves with the M14, M14 Sniper Security Rifle (SSR) or the Mk 14 as the needs of the mission dictated. Chuck Pfarrer led an eight man SEAL Team in 1983 in Beirut as part of the multi-national force that attempted to maintain peace during the Lebanese Civil War. Two of the SEALs in his squad were armed with M14 rifles. U. S. Navy sailors, presumably SEALs, operating with Kilo Company 3$^{rd}$ Battalion 8$^{th}$ Marines used a Mk 14 Mod 0 rifle to engage insurgents near Ramadi, Al Anbar Province, Iraq on May 13, 2006.

There are times when use of the M14 rifle is totally unexpected but very useful. One such instance occurred while the ballistic missile submarine *USS Nathan Hale* SSBN 623 was on deterrent patrol in 1985. As a Lafayette Class SSBN, the *USS Nathan Hale* was equipped with a device known as the “towed array.” The towed array could be described as a black steel box about the size of an automobile. It contained an assortment of radio and sonar equipment. The towed array was attached to a steel cable that could be reeled in or out from its compartment within the steel decking just aft of the missile tube hatches. With the towed array deployed, the submarine was limited to the speed, depth and dive angle it could do to prevent breaking the cable and losing the towed array. The benefit was that the submarine could remain submerged but continuously receive radio messages. While on deterrent patrol one day somewhere in the Atlantic Ocean, the Officer of the Deck forgot that the towed array was reeled out. He ordered a bell (order to change speed) too fast for the steel cable attached to the towed array. The towed array detached from the boat (submariner term for submarine) and was quickly floating on the ocean surface.

Considering the tactical situation and the sensitive nature of the equipment lost, the Captain ordered the boat to surface. After the ship had ventilated, the ship’s Captain, Commander J. W. Hamburg, and Missile Technician Second Class MacPherson armed with a M14 rifle laid (hurried quickly) to the bridge. The Captain ordered the Missile Technician to sink the towed array. After cycling 134 times, the M14 rifle had put enough holes in the towed array casing to make it sink to the bottom of the Atlantic Ocean. The boat quickly submerged immediately thereafter and carried on its deterrent patrol without further incident.

**The M14 in Other Service**

The M14 rifle remains in use today with U. S. Air Force pararescue jumpers and combat controllers, at the U. S. Air Force, Military and Naval Academies, Virginia Military Institute (VA), The Citadel (SC), Norwich University (VT), and university ROTC and Marine Corps Junior ROTC units nationwide. M14 rifles are used for shipboard security and line throwing aboard U. S. Navy Military Sealift Command and U. S. Department of Transportation Maritime Administration ships based in Saipan, Commonwealth of the Northern Mariana Islands.

The National Defense Act of 1916 provided for reserve military forces of the United States. This act of Congress also established the Reserve Officer Training Corps (ROTC) to train civilian college students in military science. ROTC programs were established to supplement the military service academies of the time, West Point and Annapolis. After World War II, Congress expanded the ROTC program to include a high school component known as Junior Reserve Officer Training Corps. The purpose of the JROTC program in high schools is to teach leadership. The Marine Corps JROTC program has expanded from fifty-seven high schools in 1979 to 220 in 2007. ROTC and JROTC units are funded by the U. S. Department of Defense.

The firing pins are removed from M14 rifles at the service academies and ROTC units. M14 rifles in the inventory of JROTC units have been demilitarized. The barrels are plugged and welded to the receiver, the firing pins removed and the bolt firing pin front hole welded over. As an aside, Mitch Mateiko, owner of Brookfield Precision Tool, rebuilt a batch of M14 rifles at Fort Devens, MA for the U. S. Air Force within days prior to the start of Operation Desert Storm. The BATF attempted to confiscate the M14 rifles from Mr. Mateiko because he did not possess a Federal Firearms License. However, the BATF backed off when it became clear to the BATF Special Agents that the U. S. military would not stand for loss of its equipment.

In August 2004, the U. S. Army Tank Automotive Command at Rock Island Arsenal published a notice of intent to purchase 350 M14 chromium plated parade rifles with accessories from Springfield Armory, Inc. under a sole source contract. A 2005 purchase order by the same Army command required delivery of eight M1A parade rifles by August 2005. The eight M1A rifles were supplied by Springfield Armory, Inc. These were non-functioning standard model M1A rifles. Each of the eight M1A parade rifles had a wood stock, a twenty round magazine, and bayonet and scabbard. All rifle metal parts were chromium plated. The M14 rifle is frequently used as a ceremonial rifle by drill teams and color guards and at Arlington National Cemetery. The Afghanistan Army uses chromium plated M14 rifles for ceremonial purposes, e.g., the funeral for former King Mohammed Zahir Shah on July 24, 2007.

Arlington National Cemetery became a military burial ground in May 1864 for the Union Army during the Civil War. The land had been previously owned by Confederate Army

General Robert E. Lee but it was illegally seized by the Federal government in 1862. In 1882, the U. S. Supreme Court declared the government guilty of trespassing and ordered the return of the land to the Lee family. With more than 10,000 soldiers buried on the property, George Washington Custis Lee, oldest son of Robert E. and Mary Lee, sold the land to the U. S. government for $150,000.00. Arlington National Cemetery is one of two cemeteries administered by the U. S. Army. The Tombs of the Unknown at Arlington National Cemetery contain the bodies of three unknown soldiers, one each from World Wars I and II and the Korean War. The Tombs of the Unknown are guarded around the clock by U. S. Army soldiers in E Company of the 3rd Infantry Regiment, also known as The Old Guard. The Old Guard has guarded the Tombs of the Unknown since April 06, 1948 without interruption. The M14 rifle has been in service with the 3rd Infantry Regiment continuously since the early 1960s. The Tomb Guard uses M14 rifles with wood stocks modified to streamline the grip area.

In 1972, Watervliet Arsenal destructively tested chromium plated M14 rifle barrels to predict useful life of 175 mm M113A1 artillery barrels. M14 rifle barrels were chosen as test specimens because it was much affordable than firing large artillery pieces to barrel failure. At least thirty-two modified M14 barrels were tested to failure by hydraulic pressure, cartridge firing or both. The M14 barrels were machined on a lathe to reduce the outside diameter to produce early failure. Some of the barrels were hydraulically cycled at seven times per minute at 44,300 psi. Other barrels were fired six times per minute using M80 cartridges. The testing of M14 barrels proved useful in determining service life for artillery cannon barrels. Warning: Under no circumstances, do not attempt this testing. The information is presented for educational purposes only.

Some federal, state and local law enforcement agencies in the United States have M14 rifles and magazines in inventory on loan from the U. S. Army through the Section 1033 program. The authority for this federal program is found in Section 1033 of the National Defense Authorization Act for Fiscal Year 1997. It is codified at Title 10 United Sates Code Part IV Chapter 153 Section 2576 (a). The Secretary of Defense may transfer excess personal property to law enforcement agencies with officers empowered to arrest and apprehend. The Section 1033 program is administered by the Defense Logistics Agency Law Enforcement Support Office (DLA LESO). Since 1995, the Law Enforcement Support Office has transferred excess DOD equipment such as aircraft, vehicles, cameras, computers, electric generators, military clothing, boots, night vision goggles and weapons to law enforcement agencies. Before October 01, 1996, this program was known as the Section 1208 program. As part of the lengthy paperwork process, a 1033 program M14 rifle will be registered with the BATFE NFA Branch by completed ATF Form 10.

A few police departments have replaced the selector locks with selector switches in M14 rifles obtained through the 1033 program. In June 2005, loaning of M14 rifles was temporarily suspended to law enforcement agencies through the 1033 program while the XM110 rifle trials were held. In July 2006, the DLA LESO instituted a mandatory inventory check of all firearms on loan through the 1208 and 1033 programs in order to verify its records. Pending requests for firearms were placed on hold until each state had completed the inventory check. Firearms obtained through the 1208 and 1033 programs are on loan from the U. S. Army and cannot be sold under any circumstances. After proper approval, the law enforcement agency can transfer the firearms to another law enforcement agency participating in the 1033 program or return them to Rock Island Arsenal. As of May 2008, 3,638 M14 rifles were on loan from the U. S. Army.

Accurized and scoped M14 rifles are also employed by a number of U. S. federal agencies such as the Bureau of Indian Affairs, the Diplomatic Security Service, and the Department of Energy Office of Secure Transportation (OST). The OST is the agency responsible for the safe transport of nuclear weapons and associated components and special nuclear materials.

Following the tragic end of the Branch Davidian community in Waco, TX on April 19, 1995, five semi-automatic only M14 type rifles, seventy-two M14 magazines, ten M14 magazine springs and one M14 trigger component were among the firearms and related items pulled from the ashes by the Texas Department of Public Safety.

**The M14 in the Arts and Entertainment**

While not related to military service or law enforcement the M14 type rifle has been used dramatically in entertainment media such as films, fine art, photography, television shows and video games over the years. A photograph of a pre-teen boy and U. S. Marines firing the M14 rifle even made its way into a children's book, *Do You Know What I Am Going To Do Next Saturday?*

Films - A list of big screen and television films with the M14 type rifle includes over sixty titles:

1960s - *Goldfinger* (1964), *Follow Me, Boys* (1966), *The Green Berets* (1968)

1970s - *Tribes* (1970), *The Omen* (1976), *Billy Jack Goes To Washington* (1977), *Black Sunday* (1977), *Slap Shot* (1977)

1980s - *A Rumor of War* (1980), *Uncommon Valor* (1983), *Missing In Action* (1984), *Purple Hearts* (1984), *Crocodile Dundee 2* (1986), *Raw Deal* (1986), *The Manhattan Project* (1986), *Full Metal Jacket* (1987), *Gardens of Stone* (1987), the director's cut edition of *Lethal Weapon* (1987), *Dear America: Letters Home from Vietnam* (1988 theatrical release), *Distant Thunder* (1988), *Empire of Ash* (1988), *The Siege of Firebase Gloria* (1988), *84 Charlie Mopic* (1989), *Counterforce* (1989), *Born On The Fourth Of July* (1989)

1990s - *NAVY SEALS* (1990), *The Hunt for Red October* (1990), *Highlander II: The Quickening* (1991), *Hot Shots!* (1991), *A Perfect World* (1993), *Demolition Man* (1993), *Hot Shots! Part Deux* (1993), *Clear and Present Danger* (1994), *Forrest Gump* (1994), *On Deadly Ground* (1994), *The Shawshank Redemption* (1994), *Congo* (1995), *Star Hunter* (1995), *Mars Attacks!* (1996), *Tremors 2* (1996), *Money Talks* (1997), *The Postman* (1997), *A Bright Shining Lie* (1998), *Rogue Force* (1998), *The Negotiator* (1998), *True Story of The Big Red One* (1998), *Dick* (1999), *Dogma* (1999), *The Boondock Saints* (1999), *The General's Daughter* (1999)

2000s - *A Better Way To Die* (2000), *Thirteen Days* (2000), *Black Hawk Down* (2001), *Spy Game* (2001), *The Believer* (2001), *Path To War* (2002), *Tears Of The Sun* (2003), *The Fog of* War (2003), *The Rundown* (2003), *Alien Apocalypse* (2005), *Mr. & Mrs. Smith* (2005), *Munich* (2005), *State of the Union* (2005), *Stealth* (2005), *The Island* (2005), *xXx: State of the Union* (2005), *Ghetto* (2006), *Ghosts of Cite Soliel* (2006), *Love Comes to the Executioner* (2006), *Skinwalkers* (2006), *US vs John Lennon* (2006), *28 Weeks Later* (2007), *Across The Universe* (2007), *Beaufort* (2007), *Hot Fuzz* (2007), *Shooter* (2007), *The Devil Came On Horseback* (2007), and *Body of Lies* (2008).

The original 1980 three hour twenty minute unedited version of *A Rumor of War* and *Born On The Fourth Of July* are the only two full-length entertainment films known to contain a scene of the M14 type rifle in automatic fire. In 1987, *A Rumor of War* was re-released as a three part mini-series without the scene of the M14E2 in action. *Forrest Gump* is the only commercial film known to show the disassembly of the M14 rifle. Two Rock SOPMOD M14 rifles were built for and used in the film *Mr. & Mrs. Smith.*

Fine Art – The M14 rifle was sculpted into two statues at Fort Dix (NJ). The statues pay tribute to the U. S. Army infantryman. Both statues are the same but have different inscriptions. Known as *The Ultimate Weapon*, both statues depict a 1950s era U. S. Army infantryman charging forward in battle as he gives a war cry with a M14 rifle at the ready. The base commander, Lieutenant General Bruce C. Clarke, ordered a statue to built to symbolize the Army infantryman. With no budget at all, the original statue was built over an eighteen month period from 1957 to 1958 using railroad track and other scrounged material by Army Specialist 4 Steven Goodman and Private Stuart Scherr.

Over time, weather had adversely affected the statue even though some repairs had been made. The sling of the M14 rifle on the original statue is partially missing from damage incurred at some point. In 1988, private funds were raised to build a new copy of the original. By a coincidental sequence of events in 1989, Mr. Goodman learned of the effort to recast the statue and became involved in the restoration effort. The new statue was cast in bronze at a foundry near Princeton, NJ using molds made from the original. The new statue, 14 feet tall and weighing over 300 pounds, was unveiled in August 1989. Today, the original statue is situated behind a review stand adjacent to Sharpe Field while the newer statue is prominently located in Infantry Park at the center of the base.

Fort Dix was an Army training center between 1917 and 1997. At various times, Fort Dix was also home to various Army infantry divisions. On October 01, 1997, Fort Dix was transferred to the U. S. Army Reserve Command. Since then, it has been a training center for Army Reserve and Army National Guard troops.

Max D. Crace was stationed in the Republic of Viet Nam in 1971 while serving in the U. S. Air Force. As an artist, he captured the life of the serviceman in Viet Nam in his illustrations. His drawings are known for their accurate detail of the uniforms and equipment worn and carried in the war.

Mr. Crace's color drawing, "One Shot One Kill" depicts a U. S. Army sniper team poised to take on the enemy with an XM21 rifle. A black and white illustration from Mr. Crace depicts a Marine readying to fire his M14 with commercial telescope and improvised mount from a kneeling position. The U. S. Army sniper equipped with a suppressed XM21 fitted with an AN/PVS-2 scope aiming for a shot is another well illustrated item of Mr. Crace's artistic talent.

The Max Crace drawing, "BOOM BOOM ROCK", depicts an American soldier with a M14 rifle leaning against a large boulder at a lookout point on Monkey Mountain. This spot on the mountain provided a panoramic view of the water and white sands of China Beach. The boulder was marked BOOM-BOOM ROCK MONKEY MOUNTAIN VIETNAM by no later than 1968. Son Tra Mountain, or Monkey Mountain, was an American military base at the north end of China Beach. Bac My An Beach, or China Beach, was located about four miles southeast of Da Nang, Quang Nam, Republic of Viet Nam. It was home to a U. S. Army medical hospital and a Rest and Recreation facility during the war. Presumably, the large boulder was so inscribed because it was a popular location for romantic interludes.

Mr. Crace later drew an illustration of a U. S. Navy SEAL employing a M14SSR rifle in Kuwait in February 1991 during the First Gulf War. As he did with his Viet Nam era illustrations, this drawing was accurate down to the last detail including the rubber pads on the Harris bipod legs.

Though the M14 rifle doesn't appear in the film, it is a part of the DVD cover art for the 2006 television movie *The Veteran*. Harold Chrismon has created a work of art out of the M14 itself by burning combat images into wood M14 stocks. Graphic artist and illustrator Phil Nguyen (Dogfight Ink) has added his creative flair and attention to detail to turn an exploded view of M14 parts diagram into a fine art lithograph print. Mr. Nguyen has also illustrated seven different M14 variations in color: M14 DMR, M14, M14A1, Springfield Armory, Inc. M1A-A1 Bush with folding stock, commercial M14 with a McMillan MFS-14 stock and scope, Mk 14 Mod 0, and the M14 with a Knight's Armament Company RAS-14 and scope.

After the M14SE rifle was introduced in 2004, Ron Smith of Smith Enterprise, Inc. made a silver ring to commemorate it. It was made of sterling silver. The lettering, CRAZY HORSE M14, was soldered on by hand. A five pointed star was added above M14 to denote active duty military service or veteran or law enforcement status. He also made a similar silver medallion.

Photography – Still photographs of the M14 rifle and its end users can be divided into three forms, media news journalism snapshots, combat photographs, and photographic art. It is the author's contention that examples of all three forms of photography exist of the M14 rifle. *Nam A Photographic History* has some splendid examples of each photographic form. Actress Cathy Rankin adds grace and beauty to a folding stock 18 " barreled M14 rifle in one of the monthly photos for the Dillon Aero 2006 Calendar.

There is one photograph including the M14 rifle that stands out as a representative example of all three forms of photography. While not central to the subject, the photo does record the M14 as the rifle carried by those affected by the tragic event. Dickey Chapelle was a war correspondent who traveled with U. S. Marines in combat during World War II. She filed stories with and submitted photographs to publications such as *National Geographic, Life,* and *Reader's Digest.* After the war, she photographed combat from the vantage point of rebel groups in Algeria, Cuba and Hungary. Later, she was the first female member of the press to parachute jump with American troops into combat while on assignment in the Republic of Viet Nam, and in her forties at that. Working for the *National Observer,* she returned to the Republic of Vietnam in the fall of 1965 to photograph and write again of the true story of the U. S. Marine Corps in action. She was so well respected by the U. S. Marine Corps that the Commandant, General Wallace M. Greene, Jr., in 1965 presented her with the Marine Corps eagle, globe and anchor device from his own uniform.

On the fateful morning of November 04, 1965, Dickey Chapelle went on patrol near Chu Lai, Quang Tin with a platoon of U. S. Marines. She was walking second in the column behind the platoon leader, Lieutenant Mauriski. The platoon had just left camp when the platoon leader tripped on a wire. This mishap set off a booby trapped mine. The resulting explosion injured four U. S. Marines and threw Dickey Chapelle twenty feet while a piece of shrapnel punctured her carotid artery. She passed away minutes later on the way to the hospital inside a helicopter. In her last minutes, U. S. Marine Corps Chaplain John Monamara prayed over her and administered last rites as the blood flowed from her neck. Behind the Chaplain, three U. S. Marines watched intently, each armed with a M14 rifle.

This tragedy was captured on black and white film by *Associated Press* photographer Henri Huet. Dickey Chapelle was the first American journalist to be killed during the war in Viet Nam. She once informed a General, "When my time comes, I want it to be on a patrol with the Marines." [2] Henri Huet and three other combat photographers were killed on February 10, 1971 when the helicopter transporting them was shot down by the enemy over Laos.

Philip Jones Griffiths spent three years in the Republic of Viet Nam, 1968 through 1970, photographing all aspects of the war. Griffiths captured the human suffering in war as well as anyone in the 1971 volume, *Vietnam Inc.* The majority of the photographs of this book should be considered photographic art while others are worthy of a headline story or a magazine cover. Included in this collection of war time black and white still photos are three which contain the M14 rifle: Limits of Friendship, Wounded VC Suspect and Forced Urbanization. In each of the three photographs, the M14 rifle is carried by an American soldier or Marine as he deals with the Vietnamese people. These three photographs speak clearly about the human condition at the artistic level.

Larry Burrows was another combat photographer that captured historical events and gut wrenching scenes on film, both black and white and in color. He photographed the first American troops, the 3rd Battalion 9th Marines, carrying M14 rifles, to come ashore on March 08, 1965 in the Republic of Viet Nam at Red Beach 2, ten miles north of Da Nang, Quang Nam. His photographs of the war in Viet Nam were showcased in a number of issues of *Life* magazine in 1963, 1965 and 1966. Larry Burrows was known to consistently put himself at the front of the action. The day before he was killed, he pulled an Army of the Republic of Viet Nam (ARVN) soldier from a burning armored personnel carrier. The next day, he was aboard the fatal helicopter flight with Henri Huet over Laos.

Perhaps the most artistic combat photograph ever taken of the M14 rifle was one by Larry Burrows on October 05, 1966, or very shortly thereafter, during Operation Prairie atop Hill 484 in Quang Tri province, Republic of Viet Nam. In that action, 1,397 North Vietnamese Army soldiers were killed and twenty-seven were taken prisoner while 239 Americans were killed and 1,214 wounded in action. The color photograph is a hill top view overlooking a valley and distant mountain range with cloudy skies in the background. In the fore ground is a fallen and defoliated tree trunk lying next to a Marine helmet and a M14 rifle with inserted magazine pointed away from the camera. This photograph graces the front cover of *Requiem*, a book about combat photographers who were killed during the war in Viet Nam.

Broadcast Network Television - The M14 rifle made its entertainment debut on the NBC broadcast television drama series *The Lieutenant* starring Gary Lockwood and Robert Vaughn. The series depicted a U. S. Marine infantry unit stationed at Camp Pendelton (CA). The series received strong support from the U. S. Marine Corps. The M14 was next featured in the credits scenes of the hit CBS broadcast television situation comedy *Gomer Pyle, USMC* starring Jim Nabors and Frank Sutton.

The M14 rifle was first animated for entertainment on October 23, 1964 during the "Treasure of the Temple" episode in the ABC network series *Jonny Quest.* In the teleplay by Walter Black, Race Bannon (voice by Mike Road) carries an M14 rifle.

The CBS broadcast television weekly series *Tour of Duty* first aired on September 24, 1987. The show was a fictional account of the struggles of a U. S. Army infantry platoon in the Republic of Viet Nam between October 1967 and January 1969. The firearms, including the M14 rifles, and military vehicles used in taping *Tour of Duty* were as historically accurate as possible. The third season had two episodes depicting use of the M14 rifle. In one episode, a Central Intelligence Agency (CIA) employee is attached to an Army squad of soldiers. The CIA employee successfully engages a Viet Cong Lieutenant with the M14 rifle he is carrying. The result is a firefight that involves the infantry squad. The CIA employee uses the M14 rifle during the firefight. The other episode from the last season involves a helicopter pilot that tires of a persistent sniper outside the Special Forces “A” Camp. Armed with a scoped M14 rifle, he takes it upon himself to hunt down the sniper. He is able to finally silence the sniper who turns out to be a woman. The M14 type rifle was seen in scenes of fictional 1960s Viet Nam combat on the NBC broadcast television drama *American Dreams*.

Cable Television - The M14 rifle was shown in the “Flashpoint Vietnam” and "Terror in Paradise" episodes in the Fox News Channel cable television weekly documentary *War Stories* hosted by Oliver North. *War Stories* first aired in May 2001 and ran for sixty-four sixty minute episodes through four seasons. The M14 type rifle has also been featured at several times on the History Channel cable television weekly program *Mail Call* hosted by former U. S. Marine, Viet Nam veteran, actor and M14 fan R. Lee Ermey.

Music Video - The M14 rifle is carried by American troops in back drop film footage of three country music videos, *Whiskey Lullaby* by Brad Paisley and Alison Krauss (2004 Arista Nashville), *8th of November* by Big & Rich (2005 Warner Bros.) and *Arlington* by Trace Adkins (2005 EMI).

Video Games – The M14, M21, and Mk 14 Mod 0 are equipment options for game players in the video games *Armed Assault, Battlefield Vietnam, Call of Duty 4: Modern Combat, Delta Force - Army of Two, Black Hawk Down, Delta Force - Black Hawk Down: Team Force Sabre, Ghost Recon 2, Ghost Recon 2: Summit Strike, Ghost Recon Advanced Warfighter 2, Grand Theft Auto Vice City Stories, Jagged Alliance 2, Men of Valor, Metal Gear Solid 4: Guns of the Patriots, Operation: Flashpoint, Rainbow 6 Raven Shield, Rainbow 6 Rogue Spear, Resistance: Fall of Man, Resistance: Fall of Man 2, Shellshock: Nam ’67, SOCOM, SOCOM II, SOCOM 3, SOCOM US Navy SEALS Combined Assault, Vietcong 2, Vietcong: Purple Haze* and *Vietnam: Line of Sight*.

**Table 9: M14 Rifle on Television**

| Show Title | Original Network / Producer | Episode With the M14 and Original Air Date |
|---|---|---|
| *Alias* | ABC | |
| *American Dreams* | NBC | |
| *Ancient Discoveries* | History Channel | "Ancient Super Navies" 04/27/08 |
| *Army Wives* | Lifetime | "The Hero Returns" 07/06/08 |
| *Battle Stations* | Military Channel | "Huey Helicopter: Air Armada" 11/04/06 |
| *Battlefield Diaries* | Military Channel / Normandy Films | "Kiowa Down" 09/26/05 |
| *Battlefield Vietnam* | PBS / Time Life Video | "Showdown in the Iron Triangle" 1998<br>"War On The DMZ" 1998 |
| *Beverly Hillbillies* | CBS | "Military School" 12/15/65 |
| *Burn Notice* | USA | "Family Business" 07/26/07<br>"Turn and Burn" 07/17/08 |
| *Combat Zone* | Discovery Channel | "Invasion of Grenada" 02/10/07<br>"Battle of Hue, Vietnam" 02/17/07<br>"Ambush in Hawijah" 03/24/07<br>"Patrol Boat Rescue Vietnam" 04/21/07 |
| *CSI Crime Scene Investigation* | CBS | "Inside the Box" 05/15/03 |
| *CSI Miami* | CBS | "Shock" 05/08/06<br>"Guerillas in The Mist" 12/10/07 |
| *DEFCON 2: Cuban Missile Crisis* | Military Channel | Television Special 07/07/07 |
| *ER* | NBC | "21 Guns" 05/18/06 |

| Show Title | Original Network / Producer | Episode With the M14 and Original Air Date |
|---|---|---|
| *Explorer* | National Geographic | "Iraq's Guns for Hire" 01/21/07 |
| *Family Guy* | Fox | "Saving Private Brian" 11/05/06 |
| *Fight Science* | National Geographic | "Special Ops" 01/27/08 |
| *For God & Country: A Marine Sniper's Story* | MSNBC | Documentary 12/12/06 |
| *Future Weapons* | Discovery Channel | "Future Combat" 03/12/07 |
| *Gomer Pyle, U.S.M.C.* | CBS | Credits scenes from second season onward |
| *Heroes Under Fire* | History Channel / Wild Eyes Productions | "Caught In The Middle" 12/16/05 |
| *High Impact: M-16* | History Channel | 04/03/09 |
| *In the Heat of the Night* | NBC | |
| *Inside The Vietnam War* | National Geographic | 01/27/09 |
| *It Takes A Thief* | Discovery Channel | "Station Break" 10/17/06 |
| *Jericho* | CBS | "Coalition of the Willing" 05/02/07<br>"Termination for Cause" 03/11/08 |
| *Jonny Quest* | ABC | "Treasure of the Temple" 10/23/64<br>"The Robot Spy" 11/06/64 |

| Show Title | Original Network / Producer | Episode With the M14 and Original Air Date |
|---|---|---|
| *Law & Order: Criminal Intent* | NBC | "The Pilgrim" 11/17/02 |
| *Las Vegas* | NBC | May 2005 episode |
| *Lock N' Load* | History Channel | 11/14/08 |
| *Lost* | ABC | "Three Minutes" 05/16/06<br>"Every Man for Himself" 10/25/06<br>"Dead is Dead: 04/08/09 |
| *Machines of War* | National Geographic | "Guns: Machines of War" 01/16/07 |
| *Mail Call* | History Channel | # 31 08/10/03 # 45 02/08/04<br># 50 04/04/04 # 65 09/26/04<br># 89 11/11/05 |
| *Man Moment Machine* | History Channel | "JFK & the Crisis Crusader" 01/16/07 |
| *Military Showcase* | Military Channel | "Coast Guard at War"<br>"Corpsmen and Medics" 01/24/07<br>"Navy Bomb Squad"<br>"Task Force Devil" 09/29/06<br>"The U. S. Army Range" 03/30/07<br>"Vietnam's Helicopter Heroes" 03/15/07 |
| *Mission Impossible* | CBS | "TOD-5" 10/14/72 |
| *Modern Marvels* | History Channel | "Axes, Swords and Knives" 05/07/02<br>"Camouflage" 06/18/02<br>"M16" 09/14/02<br>"Tunnels of Vietnam" 11/13/02<br>"Machine Guns" 04/30/03<br>"Bullets" 08/13/03 |
| *Mythbusters* | Discovery Channel | James Bond Special Part 1 01/16/08 |

| Show Title | Original Network / Producer | Episode With the M14 and Original Air Date |
|---|---|---|
| *National Geographic Explorer* | National Geographic | "Supercarrier" 12/13/06 |
| *Navy SEALs: BUDS Class 234* | Discovery Channel | 2000 |
| *Return of the Pirates* | History Channel | 10/21/07 |
| *Shooting Gallery* | Outdoor Channel | "Knob Creek 1" 09/14/07 |
| *Shootout* | History Channel | "Return to Fallujah" 07/19/05<br>"Tet Offensive" 12/08/06 |
| *Snipers* | History Channel | "Stalk & Kill" 11/11/06 |
| *Tales of the Gun* | History Channel | "Guns of Valor" 2005 |
| *The A-Team* | NBC | "Mexican Slayride" 01/23/83 |
| *The Last Templar* | NBC | Television Movie 01/25/09 and 01/26/09 |
| *The Lieutenant* | NBC | |
| *The Shield* | FX | "Spanish  Practices" 06/05/07 |
| *The X-Files* | Fox | "The Field Where I Died" 11/03/96<br>"Tunguska" 11/24/96 |
| *Top Ten* | Military Channel | "Combat Rifles" 2006<br>"Infantry Fighting Vehicles" 2006<br>"Tanks" 2006 |
| *Top Sniper* | Military Channel | Special 01/14/08<br>"Aerial Mission" 2009<br>"Urban Combat Education" 03/23/09 |

| Show Title | Original Network / Producer | Episode With the M14 and Original Air Date |
|---|---|---|
| *Tour of Duty* | CBS | two episodes in the third season |
| *U. S. Navy SEALs - In Harm's Way* | Military Channel | Television Special 12/15/07 |
| *War Stories* | Fox News Channel | "Flashpoint Vietnam The Road to War" 04/10/05<br>"Terror in Paradise" 11/03/07 |
| *Weaponology* | Military Channel | "Rapid Fire" 01/29/07<br>"US Army Rangers" 12/18/07 |

Toy M14 - Louis Marx and Company was started by Louis and David Marx of New York City in 1919. The company made and sold Marx Toys brand toys in the United States and overseas for several decades. By the 1950s, Louis Marx and Company was the largest toy company in the world. Marx toys could be found in local dime stores and in Sears, Roebuck & Co. and Montgomery Ward shopping catalogs.

During the 1950s, the company manufactured and sold a toy M14 rifle. The black and brown color molded plastic M14 was 34.5 " long. It had a battery compartment in the butt stock that was accessed through a hinged plastic door. When the trigger was pulled, the toy emitted an electrically generated gun firing sound through perforations in the integral "magazine." The "magazine" was marked USARMYM-14 on the right hand side. Louis Marx retired in 1972 and sold out to Quaker Oats Company. Unfortunately, the Marx Toys brand did not fare well due to changing market conditions of the 1970s. Quaker Oats sold the Marx Toys business in 1976 to a British toy manufacturer, Dunbee-Combrex-Marx. The new owner struggled in the sagging British economy of the late 1970s. The Marx Toys brand was no longer by 1978. Dunbee-Combrex-Marx went bankrupt in 1980. Today, original Marx Toys brand items are sought after by collectors.

Deluxe Reading (Elizabeth, NJ) was a toy manufacturer from the 1950s to the 1970s. Its most popular product line, Topper Toys, was the brand for a series of full size replica plastic toy guns in the 1960s. Two of these were the Johnny Eagle Lieutenant M14 rifle and M1911 pistol sold in 1965 as a set for boys wishing to "play Army." The Johnny Eagle series play guns were very realistic in appearance and function. The Johnny Eagle M14 magazine could be loaded with plastic bullets. It could fire caps or plastic bullets and eject shells upon firing. The toy M14 had an adjustable sling and its rear sight knobs could be turned to simulate setting of the "iron sights."

Todd McFarlane was an accomplished comic book writer and artist for Marvel/Epic Comics when he and other co-workers formed their own publishing company in 1992. In May of that year, he debuted the *Spawn* comic series. Mr. McFarlane's *Spawn* comics sold so well that he established McFarlane Toys in 1994 to produce the story characters as toy action figures. By 2006, McFarlane Toys had become the fifth largest action figure manufacturer in the United States. The Arizona based company produces many different series of action figures including sports and military professionals. The McFarlane's Military Series toys are 6 " scale action figures painted in very accurate detail to depict present-day U. S. military men in combat. The Military Series' figures are suitable for ages 13 and older. The Military Series 3 Army Ranger Sniper figure was released for sale in April 2006. It is an Army Ranger equipped with a M21 rifle while a M16 style carbine is slung off the back and a 9 mm pistol is holstered. The figure's head, arms and hands can be moved to change its pose. Hot Toys Limited released its 12 " action figure, U. S. Army 10$^{th}$ Mountain Division Sniper, in April 2008 to the public. This toy was outfitted with uniform, more than twenty accessories, a pistol and a M14 EBR.

The Hudson brand M14 toy rifle is a very realistic model for those who cannot own a military firearm or for use as a film or theatrical prop. The Hudson MG-HD-M14M toy rifle is made in Japan. The Hudson toy M14 uses a blowback action to feed, extract and eject cycle dummy non-firing cartridges from its twenty round magazine. The Hudston toy is a 1:1 scale replica made of metal and wood. It weighs 8.6 pounds and can be field stripped and assembled just like a M14 rifle. The rear sight, safety, selector switch and butt stock storage compartment door are functional. The Hudson toy M14 is supplied with a factory manual and ten dummy cartridges. Extra magazines and cartridges are factory options.

Airsoft M14 - AGM, G&G, Leapers, Inc., The Kapowwe Company, and Tokyo Marui produce airsoft M14 rifles. These are full scale electrically operated replicas that fire 6 mm pellets. In the United States, an airsoft M14 can be identified by the orange color of the muzzle.

The AGM TSD M14 electric rifle comes in black color. It is built with a metal outer barrel, metal internal parts and metal cocking handle. The Tokyo Marui M14 has a traditional wood stock appearance. G&G offers the airsoft enthusiast a choice of the full size M14 or the shorter SOCOM 16. Both G&G models use a magazine with a capacity of 470 pellets. The G&G M14 replicas fire pellets at a velocity of 330 feet per second. The G&G SOCOM 16 model can be fitted with a scope mount and optical sight. The Leapers UTG Special Ops M14 Sniper model features a metal receiver and barrel. It is offered in green and walnut color stocks. Leapers, Inc. offers an optional scope mount (Model # MNT914) for its airsoft M14. The Leapers, Inc. scope mount was made from aircraft grade alloy aluminum and utilizes a Weaver rail. The iron sights can be used with the scope mount installed. It was marketed by Marstar Canada. The Kapowwe M14 has a plastic stock and metal parts such as the charging handle, barrel and 400 round magazine. It fires pellets at 329 feet per second in either semi-automatic or automatic mode.

**Museum Collections**

A number of Springfield Armory and Harrington & Richardson M14 rifles were transferred from the U. S. Army to the Springfield Armory Historical Museum (Springfield, MA). For the most part, these transfers occurred between September 14, 1959 and May 9, 1967. M14 rifle receiver serial number 2085 was transferred to the Museum on January 22, 1986 from Rock Island Arsenal. Some of the M14 rifles at the Springfield Armory Museum were transferred back to the U. S. Army (Rock Island Arsenal (IL), Watervliet Arsenal (NY), and Fort Lee (NJ)) between April 26, 1966 and May 18, 1972. The Museum has the following M14 rifles amongst its inventory:

**Table 10: Springfield Armory National Historic Site M14 Rifles**

| Serial Number | Comment |
|---|---|
| D.D.E. 1 | one of two presentation M14 rifles made for President Eisenhower and used as an endurance test piece |
| X-42 | Harrington & Richardson M14 Guerilla Rifle |
| X-45 | Harrington & Richardson M14 Guerilla Rifle |
| 2000 | first production M14 rifle |
| 10117 | M14E2 rifle |
| 106436 | M14 rifle with the experimental X-1 40 MM grenade launcher |
| 539712 | M14E1 Type V rifle |
| 540833 | M14 rifle used as an endurance test piece for 6000 rounds |
| 545480 | M14 rifle used as an endurance test piece for 30,000 rounds |
| 552554 | M14 M rifle |
| 562823 | M14 M rifle |

USGI T44 series and M14 variant rifles are displayed a number of other museums around the United States:

Infantry Museum (Fort Benning, GA) - M14 serial number 0001
National Firearms Museum (Fairfax, VA) - M14 serial number 0006 and T44E4 serial number 1200
National Museum of the Marine Corps (Triangle, VA) - M14 serial numbers 28760, 368097, 882802 and 1077631
Ordnance Museum (Aberdeen Proving Ground, MD) - M14 serial number 907782
Rock Island Arsenal Museum (Rock Island, IL) - several M14 rifles including serial numbers 0013 and 0017
Springfield Armory National Historic Site (Springfield, MA) - see Table 6 plus others too

numerous to list
Watervliet Arsenal Museum (Watervliet, NY) - M14 serial number 9635 and others
West Point Museum (West Point, NY) - XM21 donated by Company D 2/5 Cavalry 1st Cavalry Division

**Israel Defense Forces**

The Israel Defense Forces (IDF) used the M14 as a sniper weapon system (SWS) from 1973 to 1997 when it was replaced by the M24 SWS. Israeli Military Industries built 10,000 sniper weapon systems out of the 35,000 rifles given to them by the United States in 1973 as a result of the Yom Kippur War. The remaining M14 rifles were disassembled for spare parts. The Israeli Defense Forces used M14 SWS rifles for fire support during the 1982 invasion of Lebanon. Optics on the Israeli M14 SWS rifles was either the El-Op Nimrod 6X40 mm daylight scope or the Litton AN/PVS-2 night vision scope. In 1994, the El-Op Nimrod day scope was replaced with the Swarovski Futonic 6X42 mm scope. As of 2005, the M14 SWS was still in use by the IDF Reserve.

The Israeli firearms designer Dr. Nehemiah Sirkis worked at Sardius in Israel in the 1970s and 1980s. He designed the 7.62 mm NATO caliber M26 sniper rifle based on the AK47. He also designed the bullpup conversion of the M14 type rifle known as the M36 while working in the 1980s for Sardius in Israel. Years later, Dr. Sirkis improved the Swartz firing pin lock on the M1911 type pistol and upgraded the Model 82 .22 LR rifle for Kimber Mfg., Inc. (Yonkers, NY).

The M36 appeared in Israel in the mid-1980s as the Sardius M36 SWS. Armscorp of America, Inc. made approximately ten units of the M36 in 1989 using Armscorp of America receivers. The M36 has high profile flip up iron sights. The M36 SWS was intended as a replacement for the M14 SWS. The Israel Defense Forces placed an order in the late 1980s for 1,300 M36 rifles, but Sardius only delivered fifty units. The company lacked the financial and technical resources to fill the order. Sardius went out of business in the early 1990s. Sardius was bought out by a company called Technical Consulting International (TCI) in Israel. TCI obtained a license from the government to produce the M36. Using surplus U. S. M14 rifles, TCI upgraded the M36 design, including installation of a carbon fiber stock. Dr. Sirkis worked on the M36 design improvements as an employee of TCI. TCI reintroduced the rifle as the M89 in the early 1990s.

There are two models, the M89AR with iron sights and the M89SR with a Leupold & Stevens, Inc. or Zeiss scope and no iron sights. The suppressed model is designated M89SR-SP. The overall length for the M89 is approximately 33.5 " for standard models or 40.5 " with the sound suppressor. The M89 has a 22 " fully floated barrel. The M89 has a modified operating rod handle. The handle at the rear end of the operating rod is ground flat and a circular knob is attached to the front end of the rectangular portion of the operating rod. Fully loaded with a twenty round magazine, the M89 weighs 13.8 pounds, while the M89SR-SP weighs 15.5 pounds with its sound suppressor mounted. The

Israelis fitted its M89 series rifles with Harris bipods. The M89SR-SP was used as a sniper weapon system for units concerned with concealment. It was issued mostly to two IDF Special Forces undercover units, Sayeret Duvedevan and Sayeret Shimshon. Sayeret Shimshon operated in the Gaza Strip until it was disbanded in 1994. The M89 was also exported for sale to other Special Forces units. The M36 and M89 rifles are fast handling and compact.

**Other Foreign Hostile Action**

Latin America - The Argentine Army used M14 rifles in the Falklands War with the United Kingdom. Argentine soldiers of C Company, Regimento (Especial) de Infanteria 25 made very effective use of M14 NM rifles equipped with AN/PVS-2 night optics against British forces in the battles for San Carlos and Goose Green in May 1982. The Colombian Army has used the M14 and M14K rifles in action in the 1980s against Fuerzas Armadas Revolucionarias de Colombia (FARC), a very powerful drug trafficking organization. M14 rifles were turned in by rebels to the government of Honduras at La Ceiba during the summer of 2003.

Philippines - The Philippine Army, Marines, Civilian Auxiliary Forces Geographical Unit (CAFGU), and the rebel New People's Army (NPA) have used American and Chinese M14 rifles against each other in hostile action. For example, on September 24, 2005, the NPA conducted a raid on a platoon of Philippine Army soldiers at rest in Barangay San Carlos, Isabela. In this action, five Philippine Army soldiers were killed and one M60 machine gun and one M14 rifle were captured by the NPA. The Philippine Womens Army Corps conducts close order drill with M14 rifles. The Philippine Government has issued M14 rifles to civilian volunteer organizations as well.

The Philippine Marines Reserve Marksmanship and Sniper Unit established its scout sniper school in 1969. The first Commanding Officer of the school was Lieutenant Commander Adolfo S. Feliciano. The school was in operation until 1994. The Philippine Marines scout snipers used M1D Garand rifles with M84 scopes and iron-sighted M14 rifles until 1996. The Philippine Marines scout snipers converted to an accurized M16A1 weapons system in 1996 and re-established the scout sniper school in July 2001. One squad of scout snipers is allotted per Marine Battalion Landing Team (MBLT).

The Philippine Marines continued to use the M14 rifle until at least February 2003. Philippine MBLT 8 was deployed to central Mindanao to join with the 602$^{nd}$ Brigade of the Philippine Army 6$^{th}$ Infantry Division in the February 11, 2003 attack on the Moro Islamic Liberation Front (MILF) Central Command headquarters in the 494 acre Buliok Complex at Pikit, North Cotabato. The Buliok Complex encompasses several towns in the North Cotabato and Maguindanao provinces. After five days of continuously strong resistance by the MILF, the Armed Forces of Philippines succeeded in taking the headquarters complex on February 16, 2003. As part of this operation, Philippine Marines from MBLT 8 were sent to the Liguasan Marsh in rubber rafts to search out and destroy the MILF resistance. The Buliok complex is adjacent to the Liguasan Marsh. During this combat action in the Liguasan Marsh, at least two M14 rifles can be seen in video along with M16 type rifles carried by the Philippine Marines.

Other Areas - Lebanese Forces (Christian militia) used M14 rifles to defend villages in the 1980s against the Syrian Army and the Lebanese Druze Progressive Socialist Party militia. These M14 rifles were likely acquired from Israel. M14 rifles were in use by both Haitian government forces and insurgents during the February 2004 uprising. In November 2004, at least one M14 rifle was in the hands of the rebel Sudanese People's Liberation Army. Later, in May 2006, Fur tribesmen of the Sudanese People's Liberation Army in Darfur were seen on *ABC World News Tonight* equipped with M14 rifles shortly after the Sudanese government had offered a peace agreement.

**Taiwan**

The Taiwanese government had decided to manufacture the M14 rifle and M60 machine gun for its military by no later than April 1966. In May of that year, the Taiwanese Ambassador requested the sale of ten M14 rifles and ten M60 machine guns from the United States to his country. The Combined Service Forces supplies the ordnance, communications and administrative needs of Taiwan's armed services. Under this command headed by General Lai Ming-tang, the M14 and M60 was to be manufactured.

The Military Assistance and Advisory Group (MAAG) China attempted to dissuade General Ming-tang from producing the M14 and M60. General Ming-tang was advised by MAAG China that it would be difficult to produce the M14 rifle based on the experience of American manufacturers. He was informed that the M14 receiver and bolt was made of material very sensitive to heat treatment. MAAG China estimated that it would take fifteen years for the Combined Service Forces to produce a sufficient quantity of M14 rifles for its infantry units. Nevertheless, the U. S. Secretary of State approved the Taiwanese Ambassador's request on June 02, 1966.

In October of the same year, MAAG China sent along two Taiwanese requests. The first was to obtain permission for a team headed by General Ming-tang to tour United States facilities associated with the M14 and M60. The Taiwanese also wanted technical data related to the M14 and M60. The Department of the Army approved the requests. The visits were conducted the same month and the technical data provided to Taiwanese representatives at that time.

The Taiwanese government sent a letter in December 1966 to the U. S. Deputy Assistant Secretary of Defense stating its desire to establish the capability to manufacture M14 rifles and M60 machine guns within the following two years. The Taiwanese planned to produce only 6,000 M14 rifles and 1,200 M60 machine guns. The December 1966 letter requested consent of the U. S. government so Taiwan could begin production and it also asked for additional technical data related to the effort. To this end, a formal

Memorandum of Understanding between Taiwan and the United States was signed on January 23, 1967.

The Memorandum of Understanding grants license to the Government of Taiwan to produce M14 rifles known as the Type 57. The January 23, 1967 memorandum states that Taiwan will purchase tools, components, material, documentation, technical assistance and assemblies from Fiscal Year 1967 through Fiscal Year 1969. As agreed to in the Memorandum of Understanding, the U. S. government sold some of the M14 rifle production machinery used by Harrington & Richardson to Taiwan in 1968. One complete set of fixtures and inspection gages was supplied to the Government of Taiwan by Springfield Armory. By November 1968, nineteen machine tools had been accepted by the Government of Taiwan out of 150 offered by the U. S. government. This assistance effort was coordinated by MAAG China. The Memorandum of Understanding also required that the Taiwanese T57 items produced would be interchangeable logistically with USGI M14 items.

On January 07, 1969 MAAG China made a recommendation to Admiral John S. McCain, Jr., Commander In Chief Pacific (and father of American POW and later U. S. Senator John S. McCain, III from Arizona) to provide Taiwan with any excess M14 rifles in U. S. inventory up to a total quantity of 380,000 at either no cost (Military Assistance Program) or low cost (Foreign Military Sales). The commanding officer of MAAG China made this recommendation because Taiwan had decided to equip its armed forces with the M14 but was only capable of an annual production rate of 15,000. Admiral McCain followed up a week later on the request by asking the commander of U. S. Army forces in the Pacific and the Department of the Army itself as to availability of excess M14 rifles in inventory. Admiral McCain also requested MAAG China advise him on what funds could be provided by the Taiwanese government for the purchase of spare parts, basic issue items and ammunition needed to support any excess M14 rifles that could be transferred. The Army determined that no servicable M14 rifles were available as many Army and Army Reserve commands had yet not converted to the M16A1 plus it was still unknown as to which new rifle the Republic of Korea armed services would adopt, M14 or M16A1. The Department of the Army informed Commander In Chief Pacific on July 14, 1969 that it would release 8,000 unserviceable M14 rifles to Taiwan under the Military Assistance Program at no cost except for packing, handling and transportation charges. These charges, approximately $20,000, were borne by MAAG China. These 8,000 unserviceable M14 rifles were delivered to the Taiwanese government by the end of 1969.

The Republic of China (Taiwan) made approximately 1,000,000 Type 57 rifles from 1969 until at least 1980. Due to start up difficulties, only 200 Type 57 rifles were produced by July 01, 1969. Some, if not all, Type 57 rifles were made at the 60th Arsenal in Kaoshiung, Taiwan. There are two models of Type 57 rifles. Both the first and second model receiver heels are marked in Chinese with the exception that the serial numbers use Arabic numerals. First model Type 57 rifles were assembled with many USGI parts including stocks, flash suppressors and magazines. The Taiwanese government did not receive the tooling to make flash suppressors and magazines when it received the H&R production machinery. Thus, the Taiwanese government had to make the tooling to manufacture these parts to continue production. The first models had serial numbers 000001 to 048655. The second model began with serial number 048666. The Taiwanese developed a simplified rear sight for the second model Type 57 rifle and the receiver heel information was rearranged. The flat surface immediately behind the rear sight on Type 57 receivers is very distinct in comparison to a USGI M14 receiver. There has not been any collaboration whatsoever of any kind between the People's Republic of China and Taiwan on M14 type rifle design or manufacture.

Like the United States, Taiwan eventually adopted the M16 platform as its standard infantry rifle. The T57 rifle was later replaced with the T65 adopted in 1976. The T65 series rifles were Taiwanese designed and manufactured variations of the M16A1 rifle. Due to the large number of T57 rifles produced and M14 rifles purchased from the United States, T57 and M14 rifles are still in the inventory of the Republic of China Army.

**Destruction and Export of USGI M14 Rifles**

M14 rifles have been given or sold to foreign governments under U. S. military aid programs since 1967. As of June 30, 1973, the U. S. Army had over 940,000 M14 rifles remaining in its inventory. In late 1973, U. S. Army Director of Material Acquisition, Major General Peter G. Olenchuk, testified before a U. S. House of Representatives subcommittee that the Army planned to remove the M14 rifle from its inventory "except for war contingency purposes." Major General Olenchuk retired from active duty in 1975 and passed away on October 06, 2000.

As of 1996, at least 450,000 M14 rifles had been transferred to foreign armies while another 750,000 were destroyed by the United States. The Naval Surface Warfare Center (Crane, IN) and Anniston Army Depot (Anniston, AL) were two facilities used to demilitarize M14 rifles in the 1990s. The destruction of small arms began in August 1993 at Anniston Army Depot. The machine used to demilitarize M14 rifles was not very discriminate. After the stock, sling, hand guard some of the parts were removed, the M14 was fed into the machine for destruction. This machine was referred to as Captain Crunch. Captain Crunch sheared the rifle about every four to six inches along its length. Typically, Captain Crunch took "bites" at the middle of the receiver, at the front end of the barrel chamber, near the operating rod guide, through the gas cylinder, and through the flash suppressor. Captain Crunch was destroying 3,000 small arms per day at a unit price of $3.52. Between August 1993 and March 1994, 50,000 M14 rifles were destroyed at Anniston Army Depot alone. Unfortunately, the demilitarization of small arms continued until 1996.

Some parts were retrieved, set aside and sold through a bid process to surplus parts dealers. These parts were typically the stock, hand guard, sling, rear sight assembly, bolt lock, extractor, operating rod guide and pin, gas cylinder lock, gas cylinder plug, flash suppressor nut and setscrew, front sight, and front sight screw. Parts such as operating rods, firing mechanisms and gas cylinders were also salvaged and sent to the DCM Repair Parts Program at Port Clinton, OH for sale to the public. After each rifle was destroyed, a certificate recording the receiver serial number was signed, dated and kept indefinitely. Destroyed M14 receiver halves have been sold to collectors and to those who work on M14 stocks and make M14 type rifle accessories.

Destruction of M14 Rifles in the Philippines - Over time, the Armed Forces of the Philippines have collected captured and surrendered weapons, serviceable and unserviceable, from the New People's Army and the Moro Islamic Liberation Front. In 2002, the destruction of these weapons began at Camp Aguinaldo in Quezon City, east of Manila. This was done to reduce the cost of storage. The United States government contributed $300,000.00 towards this destruction effort. By September 2007, 20,000 of an inventory of 32,000 weapons had been demilitarized.

On September 12, 2007, the Philippine military beefed up its presence in metro Manila in response to a renewed attempt to destabilize the administration of Philippine President Gloria Macapagal-Arroyo. An additional 643 troops from the Army's 5th Infantry Division and the Air Force's 760th Combat Group were brought in and housed at Camp Aguinaldo as a precautionary measure. This action reinforced the existing 3,000 troops in the capitol area. On September 20, 2007, Armed Forces of the Philippines Chief of Staff General Hermogenes Esperon, Jr. publicly confirmed the existence of a new plot to destabilize the government.

As part of the government response to this threat, a ceremony was held on September 21, 2007 at Camp Aguinaldo to publicize the destruction of the remaining 12,000 captured and surrendered weapons. General Esperon attended the ceremony covered by the media. General Esperon stated that it was necessary to demilitarize the weapons to reduce the number of "loose" firearms. The destruction procedure including shearing, torch cutting and sawing rifles and machine guns into scrap metal. Amongst the remaining 12,000 firearms collected for destruction were M1 Carbines, M1 and M16 rifles, and at least four M14 rifles. The proceeds from sale of the scrap metal, an estimated P4,000,000 ($88,000), was to be added to the modernization fund of the Armed Forces of the Philippines.

The M14 Rifle in Foreign Assistance - A partial list of foreign governments that have received M14 rifles from the United States includes Argentina, Belize, Chad, Chile, Colombia, Dominican Republic, Estonia, Greece, Haiti, Israel, Jordan, Latvia, Lithuania, Niger, Philippines, Republic of Korea, Taiwan, Tunisia, Turkey and Zaire. The M14 rifles transferred to Greece were used for guard duty at Greek Navy bases.

In 1968, the government of the Republic of Korea (ROK) was considering a small arms plant on its own soil for the purpose of providing its miltary with a replacement for the M1

Garand rifle and M1 Carbine. ROK Minister of Defense Choi hoped for a joint venture with the U. S. government to produce the M16A1 rifle for the Korean armed services. Representatives from the ROK Ministry of National Defense and the U. S. Department of Defense met in late May 1968 to discuss the matter. U. S. Deputy Secretary of Defense Paul H. Nitze was agreeable to idea. However, the U. S. Department of State questioned whether or not it was the best interests of the United States for South Korea to produce its own rifle. The Secretary of State requested an assessment from the Joint Chiefs of Staff and the Commander In Chief Pacific as to what rifle would be best for the ROK military. The U. S. Secretary of State held out the carrot of surplus M14 rifles being available in the near future. The Commander In Chief Pacific stated in his recommendation to the Joint Chiefs of Staff on August 06, 1968:

> In summary, the M-14 is an excellent weapon for conventional warfare at the extremely long combat ranges found on the relatively barren Korean terrain, while the M-16 provided an effective weapon for internal defense operations. As the threat indicates a requirement to conduct both types of operations, there are excellent argument [sic] to arm the ROKF with a mix of the weapons.

In early November 1968, the Commander In Chief Pacific (CINCPAC) tried to determine the availability of surplus M14 rifles as an alternate means of replacing the M1 Garand rifle then in use by the ROK military services. The Department of the Army replied to CINCPAC on November 07, 1968 that a study was being conducted to determine if the U. S. Army should retain both the M14 and the M16A1 as standard rifles or just the M16A1 alone. The Department of the Army further advised that if the Department of Defense decided in favor of the M16A1 alone, it would inform CINCPAC of any surplus inventory of M14 rifles. Subsquently, the Commander In Chief of U. S. Army forces in the Pacific notifed CINCPAC on December 13, 1968 that there would be no surplus M14 rifles from the conversion to the M16A1 in the Republic of Viet Nam. M14 rifles pulled from units in Viet Nam were being sent back to training commands in the continental United States.

At the beginning of 1969, CINCPAC believed there were two worthwhile means of replacing the ROK military shoulder weapons: 1) construction of a small arms plant in Korea dedicated to producing 600,000 M16A1 rifles or 2) the United States would supply 250,000 M14 rifles to the Republic of Korea for its Army combat units and M16A1 rifles for ROK internal defense operations. The Joint Chiefs of Staff proposed a third alternative to CINCPAC on January 03, 1969, U. S. sources would provide 255,000 M16A1 rifles for ROK Army combat units and 360,000 M14 rifles, once available and depending on cost, to ROK combat support units. At the time, the Department of the Army was not able to provide the cost of surplus M14 rifles to CINCPAC. Admiral McCain responded on January 18, 1969 to the Department of the Army as follows:

> . . . both the M-14 and M-16 rifles provide significant military advantages for use by ROKF, none of which are overriding in CINCPAC's view. Therefore, the

> relative cost of equipping ROKF with various rifle systems is a key factor in reaching a decision on which alternative to implement and must be determined before the alternatives . . . can be properly evaluated and the facts concerning these alternative methods can be placed before the ROKG . . . .

The Department of the Army replied to Admiral McCain on February 06, 1969. The Army was not able to provide firm pricing and availability of surplus M14 rifles because the Secretary of Defense had not yet decided to make the M16A1 rifle the sole standard rifle for the entire U. S. Army. Admiral McCain then recommended to the Joint Chiefs of Staff on February 19, 1969 that a decision to build a small arms plant in Korea be postponed and that the DOD study on rifle standardization be completed without delay.

By March 1969, CINCPAC was evaluating two options for a new ROK military rifle: 1) the United States would provide 40,000 M16A1 rifles to ROK combat units and and build a small arms plant in Korea to produce 570,000 M16A1 rifles or 2) the United States could supply 20,000 M16A1 and 230,000 M14 rifles to ROK combat units and ROK combat support units would keep the M1 Garand and M1 Carbine. These alternatives did not bear fruit in 1969 because the estimated cost to produce the M16A1 rifle in Korea was in excess of what the Republic of Korea government could bear and the cost and quantity of surplus M14 rifles was unknown. The U. S. government eventually supplied a number of M14 rifles to the ROK Army by no later than 1978.

Under Fiscal Year 1966 funding for the Military Assistance Program, 908 M14 rifles were delivered to the Philippine government in early 1967 to help equip a Constabulary Battalion Combat Team. The Philippine Marines, Naval Infantry and Army Airborne soldiers had M14 rifles in their weapons inventories before Mount Pinatubo erupted in June 1991. Some examples of U. S. government transfers of M14 rifles are as follows:

**Table 11: U. S. Government Exports of M14 Rifles to Foreign Nations**

| Nation | Quantity | Year(s) | Transfer Method | Rifle Model |
|---|---|---|---|---|
| Belize | 15 | 1994 | EDA | M14 |
| Chad | 3,503 | 1983 | MAP | M14A1 |
| Chad | 2,000 | 1987 | MAP | M14 |
| Chile | 12 | 1994 | EDA | M14 |
| Colombia | 10,000 | 1990-92 | FMS | M14 |
| Estonia | 40,500 | 1998 | EDA | M14 |
| Ethiopia | 23,451 | 1971-75 | MAP | M14 |
| Greece | 9 | 1995 | EDA | M21 |

| | | | | |
|---|---|---|---|---|
| Israel | 35,000 | 1973 | | M14 |
| Israel | Not available | 1978 | FMS | M14 |
| Latvia | 10,000 | 1996 | EDA | M14 |
| Latvia | 30,500 | 1999 | EDA | M14 |
| Lithuania | 40,000 | 1998 | EDA | M14 |
| Philippines | 908 | 1966 | MAP | M14 |
| Philippines | 3,638 | 1994 | EDA | M14 |
| Senegal | 20 | 1992 | MAP | M21 |
| Taiwan | 8,000 | 1969 | MAP | M14 |
| Taiwan | 30,450 | 1995 | EDA | M14 |
| Turkey | 200 | 1995 | EDA | M14 |

EDA = Excess Defense Articles program FMS = Foreign Military Sales program MAP = Military Assistance Program

124,815 M14 rifles were exported under the EDA program between 1995 and 1998. Some were given at no cost under the EDA and MAP programs while other M14 rifles were sold under the FMS program. The Excess Defense Articles program is authorized under the Federal Assistance Act of 1961. Other M14 rifles were transferred to foreign nations under Military Assistance Programs. Some M14 rifles were given to the Nicaraguan Contras by the U. S. government in 1981 or 1982. Accessories were often given away or sold with the rifles as part of the assistance program. For example, M6 bayonets and M8A1 scabbards were sent along with M14 rifles transferred to Ethiopia.

Initially, the U. S. Department of Defense destroyed large quantities of these newly surplus weapons, including 479,367 M14 rifles in 1993 and 1994 and roughly 350,000 M16A1 rifles in 1996. But under increasing pressure from gun advocates in Congress, an amendment was passed to the Defense Authorization Act in 1996 to prohibit the Army from destroying these surplus weapons. The amendment was passed in subsequent years creating a stockpile of surplus weapons that civilian collectors hoped would be made available for sale at a later date.

In a change of policy in 1995, the Army began to transfer its surplus stocks to foreign governments. Between 1995 and early 1998, 321,905 surplus small arms were exported to foreign militaries under the Excess Defense Articles program. The main recipients were Estonia, Latvia and Lithuania, Israel, Philippines and Taiwan.

From the perspective of the U. S. government, this policy of exporting defense articles to friendly governments has the twin benefit of strengthening vulnerable allies while simultaneously reducing the surplus stockpile. The blanket prohibition on the re-transfer of U. S. military equipment without prior approval from the U. S. government is also said to prevent the weapons from being diverted to third countries.

The reader may be puzzled regarding why M14 rifles (and other small arms) should be destroyed or exported by the United States. During the Cold War, the United States military inventoried a huge stockpile of weapons that would enable it to fight two wars simultaneously. From World War II to the late 1980s, this equated to about 2.3 small arms for each member of the Armed Forces. The shift during the 1990s towards flexible, high-tech rapid-reaction forces meant that a large reserve of small arms was thought to be no longer required.

A Total Army Assets database query performed during the first half of 2001 found a total U. S. Army inventory of 120,021 M14 rifles. This included M14 rifles in each classification of readiness condition. This query did not account for M14A1, M14M and M14 NM (National Match) rifles in the possession of the U. S. Army or any M14 rifles in the inventory of the U. S. Navy, Marine Corps or Air Force. As of mid-2003, the U. S. Army inventory was approximately 96,000 M14 rifles in Condition A readiness. In May 2007, the U. S. Navy held a total of 4,354 M14 rifles aboard its ships.

The Estonian Defense Forces have two designated marksman M14 models, TP and TP2. The M14 TP was designed around 2000. It is has an Estonian manufactured medium green color plywood stock with adjustable cheek rest. The stock was intended to allow the operator emergency use of iron sights without removing the Chinese made scope. Unfortunately, the cheek rest doesn’t raise high enough for a proper cheek weld when using issue the scope mount, rings and scope. The plywood stock also throws the balance of the rifle off towards the muzzle.

In 2008, several hundred of the M14 rifles in Estonia were built into Designated Marksman models for use at the squad and platoon level in the Estonian Defense Forces. These are known as the M14 TP2 model. They were fitted with Knight’s Armament RAS-14 rail mounts and Schmidt and Bender, Inc. 3-12x50 mil dot reticle day scopes. As of early 2008, the M14 TP2 model utilized the USGI synthetic stock with a six o’clock M1913 Picatinny rail and strap on cheek rest. An Eberlestock aluminum chassis stock was being considered for it though. The M14 TP2 prototype was made in 2007. The final production version was expected for unveiling by the fall of 2008.

By 2002, Lithuania had developed its own version of the designated marksman M14, the M14L1. The modification of USGI M14 rifles was done in Lithuania by Koncernas Pergale. The M14L1 sports a thumbhole stock with the front end only extending to the front side of the operating rod guide. This leaves the gas cylinder and cylinder portion of the operating rod exposed. A scope mount, rings and scope were included as part of the conversion.

Georgia Arms Precision (Villa Rica, GA) performed the build of a number of M14 rifles into M62-R1 rifles for the Jordan Armed Forces in December 2005. The M14 rifles are owned by the government of Jordan through a military assistance program of the U. S. government. The build specification included a 22 " Badger Barrels, Inc. match grade heavyweight stainless steel barrel, McMillan M3A bedded fiberglass stock, shimmed gas system, match tuned firing mechanism, Smith Enterprise, Inc. direct connect flash hider and extended bolt lock, Turner Saddlery biothane sling and Harris model HBRM-S bipod. The optics configuration included a Smith Enterprise, Inc. part number 2006 scope mount, Leupold & Stevens, Inc. 3.5-10X day scope, Badger Ordnance M62 single-piece ring mount, and Thales brand night scope. With the exception of the cheek rest, scope and rings, the M62R-1 was given a desert tan finish. The M62-R1 rifle was built with the iron sights removed and the headspace set to 1.632 " + or - 0.001 ".

**Foreign Sales of USGI M14 Rifles**

Israel has exported USGI M14 rifles to Canada, Germany and New Zealand for commercial sale and to Italy for government use. In 1987, a number of USGI M14 rifles were imported into Canada from Israel. These rifles had the selector lug cut off in order to comply with Canadian law.

During 1988 and 1989, two licensed gun dealers in Germany imported USGI M14 rifles into that country from Israel. The two dealers imported the rifles one at a time per customer request. Initially, there was not much interest in these rifles. Then the German firearms magazine, *Deutsches Waffen Journal,* printed a story on the Springfield Armory, Inc. M1A and Norinco M305 rifles in its July 1988 issue. The article generated some interest in the M14 type rifles among the gun buying public. In the May 1989 issue of *Deutsches Waffen Journal,* one of the gun dealers, Stefan Harlacher, advertised the USGI M14 rifle for a price range of 1,585 Deutsche Marks to 1,685 Deutsche Marks. Subsequently, a large firearms importer, Interimport, and a large firearms distributor, Frankonia, sensed a business opportunity. Frankonia place an advertisement in the June 1989 issue of *Deutches Waffen Journal* for USGI M14 rifles at the substantially lower price of 1,099 Deutsche Marks. These rifles were sold without the selector lug and no select fire components. Shortly after the Frankonia sale began, the Bundeskriminalamt (the German equivalent of the U. S. Federal Bureau of Investigation) declared the imported M14 to be a military small arm. All further importation was halted. The USGI M14 rifles that had been imported were allowed to remain in private hands but had to be permitted by the Bundeskriminalamt. All transfers, sales and repairs regarding the USGI M14 rifles had to be documented. There were a total of about eighty USGI M14 rifles imported and sold in Germany. With a new firearms law effective April 2003, these M14 rifles can be transferred without restriction in Germany among those with gun permits.

A resident of Isle of Jersey, United Kingdom is the legal owner of USGI Winchester M14 rifle serial number 22263. Private individuals in Barbados and Denmark legally own Harrington & Richardson USGI M14 rifles. A small number of M14 rifles remain in the

Socialist Republic of Viet Nam. At least one M14 and one M14A1 are on display at the War Remnants Museum 28 Vo Van Tan District 3 Ho Chi Minh City (formerly known as Saigon). Some M14 rifles have been exported from Viet Nam to the Netherlands, Finland, Luxembourg, and Norway. M14 rifles are available for sale to private individuals in those countries. For example, Mr. van Veen of Amsterdam imported M14 (and M1 Garand and Carbine) rifles into the Netherlands during the 1980s.

Private individuals in Queensland, Australia with a valid state license owned USGI and Chinese M14 rifles from at least 1991 until 1996. In 1996, the Australian government banned private ownership of semi-automatic firearms except for a few private individuals possessing pest control licenses. The 1996 legislation included a buy back program for semi-automatic firearms including M14 rifles.

In 2006, the Queensland Department of Fisheries and Wildlife had at least fifty USGI M14 rifles in its equipment inventory. This agency has at times employed a sharpshooter equipped with the M14 rifle to kill wild pigs, wild horses and buffalo from a helicopter. The selective hunting is conducted as part of the government's wildlife conservation program. The Cape York Weeds and Feral Animals Program in Queensland was still ongoing in early 2007. Firearms and firearms parts imported for the use by state law enforcement agencies in Australia must be approved by the Attorney General of Australia. Unfortunately, as of April 2007, obtaining federal approval to import spare parts or new M14 type rifles was extremely difficult even though the purpose of such was to support official state government conservation efforts.

Countries that allow the commercial importation of USGI M14 rifles generally do not allow owners to have automatic fire capability so the rifles and / or parts are regulated to prohibit select fire. For example, M14 rifles are legal for civilians to own in Germany but the selector lug is milled off and the USGI flash suppressor is replaced with a faux suppressor. Private owners of USGI M14 rifles in Finland must have the selector lug cut off to comply with the law. In the Netherlands, it is illegal for all of the select fire parts to be installed on civilian owned M14 rifles. A M14 type rifle owner in Japan may install the select fire components but must render the parts incapable of automatic fire. One M1A rifle owner in Japan removed enough material from the bottom edge of the sear release to prevent contact with the sear with the switch in the Automatic position. This modification prevents automatic fire and makes his M1A compliant with the law in Japan.

**M14E1**

Between September 1961 and January 1963, Springfield Armory developed five versions of a folding stock designated as the M14E1. The folding stock M14 was developed at the request of the U. S. Army. Such a rifle was to be carried by paratroopers, tank crews and vehicle drivers. The designs included both under-folding and side-folding stocks for the M14 rifle as follows:

**Table 12: M14E1 Rifle Types**

| Model | Description |
|---|---|
| M14E1Type I | no information available, tool room folding style model |
| M14E1Type II | under folding style with left side mounted front and rear sling swivels |
| M14E1Type III | under folding Soviet AKM style with left side mounted front and rear sling swivels |
| M14E1Type IV | under folding style with folding front and rear pistol grips and hinged butt plate |
| M14E1Type V | left side folding style with folding front and rear pistol grips and hinged butt plate |

The M14E1 Type IV was outfitted with a clip on muzzle stabilizer that was also capable of mounting a bayonet. One M14E1 Type V rifle was made in January 1963. The Type V stock had an aluminum bar stock arm, aluminum butt plate and swivel bracket. However, the difficulties encountered in producing forged aluminum stock arms were not resolved due to a lack of funding. The M14E1 Type V was shown to the Army and Marines at Fort Belvoir, Fort Knox, Fort Campbell, Fort Benning and Marine Corps Base Quantico by representatives of Springfield Armory during the first six months of 1963. Fort Benning recommended that the Type V stock be changed to a right side folder and that the front pistol grip fold to the rear instead of to the front. The Marines Test Center recommended acceptance of the M14E1 but it was not meant to be. There is a M14E1 Type V rifle on display at the Rock Island Arsenal Museum (Moline, IL).

**M14E2 and M14A1**

The M14E2, later M14A1, rifle assigned to the automatic rifleman had an M14E2 stock and sling, stabilizer assembly and M2 bipod with sling swivel. His rifle would have a selector switch and selector shaft spring installed in place of the selector lock. Initially though, the automatic rifleman was equipped with a M2 bipod attached to his M14 rifle with or without the sling swivel. This configuration was known as the M14 (Modified) rifle, not to be confused with the M14 M with welded select fire components.

The M14 (Modified) suffered from excessive bullet dispersion, heavy recoil and severe muzzle rise in testing done during the spring of 1961 at Fort Benning. Thus, the U. S. Army Infantry Board was given the task later that year of improving the performance of the M14 (Modified) rifle. This development effort was known as the M14 (USAIB). Captain Durward Dean Gosney, a native of Phoenix, AZ and an Army Infantry Board test officer, developed three major changes to the M14 (Modified) rifle by no later than March 1962. The December 1962 CDC Rifle Evaluation Study declared the M14 (USAIB) "a definite improvement over the M14(M) in the automatic rifle role." Captain Gosney was recognized as the creator of the design officially classified in late 1963 as the M14E2.

Major Gosney was later killed while serving in the Republic of Viet Nam.

The M14 (USAIB) design differed significantly from the M14 (Modified) in three ways: 1) attachment of a muzzle stabilizer over the flash suppressor 2) a straight-line stock with a rubber butt pad and 3) dual hand grips. Whether by design or not, the muzzle stabilizer and the flash suppressor work in conjunction to reduce lateral bullet dispersion and reduce recoil by 25 %. Unfortunately, the muzzle stabilizer did not suppress the flash signature. The prototype M14 (USAIB) stock was made by Master Sergeant Raymond Behnay at the U. S. Army MTU and those used in testing were manufactured by Reinhart Fajen. The prototype straight-line stock included a pistol grip, butt pad and butt plate flapper. It reduced muzzle rise and further reduced recoil.

On October 02, 1963, the U. S. Army Weapons Command made a request to Springfield Armory to make some changes in the M14 (USAIB). These changes included redesign of the fore hand grip and the butt stock sling swivel. The differences between the M14 (USAIB) and the M14E2 were as follows:

1) Stock fabrication - The M14 (USAIB) stock was made by cementing several pieces of wood together. A standard M14 stock was used for the front end of the assembly. The M14E2 stock was made from two pieces of wood. The standard M14 stock blank was cut to form the M14E2 stock except for the pistol grip. The pistol grip was formed from a second piece of wood and then secured to the stock body by a dowel and adhesive. The front end bottom and sides of the M14E2 stock was left thicker than the M14 stock to better withstand heat generated by automatic fire. The butt end and the pistol grip were reshaped for better accuracy and operator comfort.

2) Recoil pad - The recoil pad was added to the M14 (USAIB) to reduce operator fatigue. The M14 (USAIB) recoil pad was of commercial manufacture. It was modified to accept the shoulder rest and had to be hand fitted to the stock. The recoil pad had ribbing on the sides allowing debris to collect. The material of the commercial recoil pad had poor resistance to cold weather, abrasion and oil. Consequently, the recoil pad required replacement more often than desired. The M14E2 recoil pad was molded from rubber with excellent resistance to cold weather, abrasion and oil. It was smooth on all sides so that no foreign material would be collected by it. It was designed with an integral steel shoe for strength and a tight fit with the stock. The M14E2 recoil pad was secured to the stock with two screws. Two rubber plugs filled the cavities in the recoil pad over the screws as a means of keeping out snow and other debris. The M14E2 recoil pad was interchangeable from stock to stock.

3) Shoulder rest assembly (butt plate assembly) - The M14 (USAIB) was put together with a standard M14 stock shoulder rest (butt plate flapper) mounted on a block. The shoulder rest helped the rifleman to control muzzle rise. A stop plate was screwed to the top of the block. The stop plate sat above and extended over the sides of the butt end of the stock. There was no detent to keep the shoulder rest in the open or closed position. The

shoulder rest for the M14E2 was simplified from the M14 (USAIB). It had only one moving part, the shoulder rest plate (butt plate flapper) itself. The M14E2 stock shoulder rest used a detent to hold the rest plate either open or closed. Additionally, the obtrusive stop plate was eliminated.

4) Muzzle stabilizer - The muzzle stabilizer for the M14 (USAIB) consisted of a steel cylinder drilled with holes and then welded to the flash suppressor at the front sight dove tail base. The M14E2 muzzle stabilizer was a slip-on assembly that was secured to the bayonet lug by a screw and lock nut. The M14 combination tool was used to install and remove the M14E2 muzzle stabilizer.

5) Fore hand grip assembly - The M14 (USAIB) fore grip was made from wood. It folded down against the stock away from the operator. Its position on the stock bottom side could not be moved. The M14E2 fore grip was a lot less bulky and made from aluminum and insulated with a rubber coating. Six holes were drilled in the bottom side of the M14E2 stock to allow the fore hand grip to be moved up to 5 " forward or aft in 1 " increments. The four holes not used to secure the fore grip assembly were plugged with rubber grommets to keep out debris. A latching mechanism locked the M14E2 fore grip in the open position and a detent kept it folded against the stock towards the operator when closed. The latching mechanism was sized so that the rifleman could operate it with mittens. Since it was less bulky, the M14E2 was much more comfortable to carry at sling arms.

6) Sling - The M14 (USAIB) was equipped with the standard cotton web small arms sling used on the M1 and M14 rifles. The M14E2 sling was borrowed from the M1918A2 Browning Automatic Rifle. An extra sling hook was added to connect the M14E2 (M1918A2) sling to the fore hand grip sling swivel. The fore and rear hand grips, in tandem with the M14E2 sling, increased the downward force acting on the M2 bipod legs from 7 pounds with the M14 (Modified) to 31 pounds for the M14E2. The bipod sling swivel also facilitated ease of carry for the M14E2 at sling arms.

7) Butt sling swivel - The M14 (USAIB) had a fixed butt sling swivel. The M14E2 butt sling swivel could pivot 90 degrees to the left side. This enhanced operator comfort when carrying the M14E2 at sling arms.

Final testing on the M14E2 rifle was completed at Fort Jackson, SC in early 1964. Much tighter shot group sizes were obtained with the M14E2 over the M14 (Modified), i.e., 4 " versus 12 " at 25 meters. Like its predecessor, the M1918A2 Browning Automatic Rifle, the M14A1 produces the best effect when fired in two or three round bursts. This was confirmed during testing in 1965 at Fort Benning, GA. With a modest amount of practice, the author has obtained 7 " three shot groups at 100 yards with a NFA Registered Springfield Armory, Inc. M1A in automatic fire. The time to reload is critical for the automatic rifleman.

Physical data for the M14A1 Rifle includes the following:

Length of pull = 13.16 "
Overall length with the shoulder rest up - 46.88 "
Overall length with the shoulder rest down - 44.087 " minimum to 44.272 " maximum
Command height with M2 bipod legs extended - 9.72 " minimum to 13.12 " maximum
Minimum height required to assemble magazine into rifle - 8.43 "
Length of operating rod travel - 4.72 "
Case ejection pattern - half-past one to three o'clock if twelve o'clock is the muzzle

Between July and December 1964, 8,350 M14 rifles were converted to M14E2 rifles and delivered to the military. Originally, TRW and Winchester were tasked with the M14E2 conversions but the supplier was late in delivering the rubber coated metal fore grips. When the fore grips were finally delivered, Springfield Armory did the conversions in order to speed delivery of the M14E2 to military units. By January 1964, the M14E2 had been designated as the M14A1. The classification M14E2 means the second experimental design for the Model 14 rifle. M14A1 stands for the first alternate configuration for the Model M14 rifle. Improvements to the M14A1 design were drawn up in April 1966.

There were two versions of the USGI pistol grip stock assembly. The earlier stock assembly, 7791671, was developed in October 1963 by Springfield Armory. The latter stock assembly, 11686528, was drawn up in April 1966. The latter stock has a slightly different hand grip assembly and stock subassembly than the earlier version. The late version hand grip assembly was designed to withstand a minimum load of 200 pounds pushing directly to the rear. Among collectors, the terms M14E2 and M14A1 are interchangeable.

The M14A1 as a Sniper Rifle - Less than 100 M14 rifles were fitted with walnut M14E2 stocks for use as sniper rifles. These rifles could also fire M198 duplex ball ammunition in automatic if need be. This work was performed at Anniston Army Depot and Rock Island Arsenal. An example of these M14A1 sniper rifles is discussed in the article entitled "Snipers in Vietnam Also Need Firepower" by Army Lieutenant Louis A. Garavaglia in the January 1968 *American Rifleman*.

Prior to 1968, a sniper detachment was created within the Long Range Reconnaissance Patrol (LRRP) Company of the U. S. Army 4th Infantry Division in Viet Nam. The LRRP Company sniper detachment tested the following rifles for use as a sniper weapon: Winchester Model 70, Remington Model 700, M14, M16A1, and three versions of the AK47. The M14 was chosen because it was reliable, capable of long distance shots and could deliver volume of fire if needed. These M14A1 sniping rifles were used in the Central Highlands of the Republic of Viet Nam and configured as follows: 1) all Harrington & Richardson models 2) equipped with M14E2 stocks 3) equipped with M84 2.2 X scopes 4) lighter M16A1 bipods mounted on the gas cylinders just forward of the spindle valves and 5) the selector switches were installed. The M14A1 proved sufficiently accurate for sniping use. It was found that experienced shooters could easily hit Army E type silhouette targets at 700 meters from the prone position. This was equivalent to shooting a man that was kneeling at 700 meters. Snipers equipped with these scoped M14A1 rifles took nine magazines of ammunition with them. The nine magazines were loaded to eighteen rounds each. Two magazines contained M118 match grade cartridges and the other seven magazines held M198 duplex ball rounds. Should the three man sniper team get into a firefight, snipers would remove the match ammunition, insert a magazine of duplex rounds and switch to automatic for suppressive fire.

At the end of 1970 or early 1971, a custom built M14A1 rifle was issued to Chuck Karwan, an officer of the U. S. Army 1st Cavalry Division, while in the Republic of Viet Nam. This rifle was bedded and fitted with a Griffin & Howe, Inc. design scope mount, M84 scope and M14 butt plate. The hand grip assembly was removed.

**M14 Grenadier**

The M14 Grenadier's rifle was equipped with the M15 grenade launcher sight and the M76 grenade launcher. The M15 sight was designed to be used by the grenadier firing from the shoulder or from placing the rifle butt stock on the ground. The grenadier prepared the M14 rifle by turning the spindle valve, loading a grenade cartridge into the magazine and placing a grenade on the M76 grenade launcher. The grenadier could propel a one and one-half pound grenade out to a distance of 250 meters depending on the angle at which he held the rifle and which launcher position the grenade was placed on. The M76 launching positions consisted of nine annular grooves marked 2A, 3A, 4A, 1, 2, 3, 4, 5 and 6 from rear to front. By pushing back the rifle grenade rearward on the grenade launcher, the grenadier could choose the position for launching the grenade. The tenth annular groove on the M76 grenade launcher was located forward of the retainer spring at the front end. The forward end annular groove was designed as a safety feature. It would keep the rifle grenade from falling off the launcher if the retainer spring just to the rear of it were to break. Rifle grenade types included M23 smoke, M27 signaling, M30 high explosive anti-tank (HEAT), M19A1 white phosphorous and M11A4, M29 and M31 inert training. The M30 HEAT rifle grenade was designed to have the capability to breach 10 " of steel or 20 " of concrete.

The XM79 40 mm grenade launcher was adopted by the U. S. Army on October 19, 1960. It was classified as the M79 on December 15, 1960. Pilot line production for the M79 was underway in the fall of 1960 at Springfield Armory. The U. S. Army 82nd Airborne Division used the M14 and M76 for launching smoke grenades during combat operations in 1964 in the Republic of Viet Nam. Both Springfield Armory and TRW made M79 grenade launchers for the U. S. Army between 1961 and 1967. The M79 had largely replaced the M14 rifle for the purpose of launching grenades by 1965. However, M14 rifles equipped as such did see combat service as late as June 1966 with the U. S. Marine Corps. C Company 1st Battalion 5th Marine Regiment 1st Marine Division launched grenades against the Viet Cong with the M14 rifle during Operation Kansas in Que Son Valley, Quang Tin, Republic of Viet Nam on June 16, 1966.

Besides launching grenades, the spindle valve on the M14 rifle is turned to the closed position (slot in the horizontal position) when shooting a line (rope) from ship-to-ship or when the shooter does not desire the cartridge case to be ejected. The spindle valve may also be closed during routine barrel cleaning to prevent the introduction of bore cleaner into the gas cylinder. If so, remember to open the spindle valve when finished cleaning. Between the spring of 1958 and the fall of 1959, the spindle valve was redesigned at Springfield Armory to have the slot cut across the entire diameter of the spindle valve head.

**M14 M**

A very few rack grade USGI M14 rifles were permanently rendered semi-automatic. This was accomplished by welding the selector shaft lock, selector lock pin, selector shaft, sear release and the receiver. The welding of the select fire parts was done using the Gas Tungsten Arc Welding method. This prevented removal of the selector lock and installation of the selector switch. In this configuration, the rifles were classified as M14 M. The M14 M rifle was identified by engraving the letter M to the right of M14 on the receiver heel. This modification was officially announced in the Director of Civilian Marksmanship's 1963 Rifle National Matches bulletin. The Army also announced it in Army Regulation 920-25 dated 8 February 1965.

The U. S. Army intended to issue M14 M rifles to National Rifle Association associated shooting clubs and to sell them to the public through the Director of Civilian Marksmanship (DCM) program but this failed to occur. An order was placed in 1962 for Springfield Armory to deliver 1,000 M14 M rifles to meet this requirement. Springfield Armory had converted 1,009 M14 rifles to M14 M models by June 30, 1963. After the M14 M rifles had been delivered to the U. S. Army in 1963, they were sent back to Springfield Armory for additional welding of the select fire components to satisfy the Alcohol and Tax Unit of the Internal Revenue Service. The extra work was completed in June 1964. The Gun Control Act was signed by President Lyndon B. Johnson on October 22, 1968 and it went into effect on December 16, 1968. The Gun Control Act of 1968 changed the definition of a machine gun. This law, among other things, prevented distribution of the M14 M rifle to the public.

**M14 NM**

A development program to turn the M14 into a competition match rifle was begun at Springfield Armory in 1959. In July 1960, the Chief of the Engineering Division at Springfield Armory took the decision to remove 200 M14 rifles from production to manufacture the first M14 NM rifles, 100 in FY 1961 and 100 in FY 1962. The effort to develop a match grade M14 rifle originated with Lieutenant Colonel Joseph Smith, U. S. Army. Colonel Smith was the Director of Civilian Marksmanship from 1958 until 1971.

Colonel Smith was the driving force in convincing the U. S. Army to spend the funds to develop and produce the M14 NM. He promoted the use of the M14 rifle in competition shooting to the National Rifle Association. As part of the Springfield Armory National Match Engineering Program, the first accurized M14 rifles were tested in early 1961.

The competition match M14 rifle was designated M14 NM. Springfield Armory and TRW made M14 NM rifles from scratch. Additionally, Springfield Armory and Rock Island Arsenal converted some M14 rifles to M14 NM models. M14 NM rifles received the same welding operation as the M14 M rifles. The last complete set of drawings for the M14 NM was revised in January 1986. Like the M14, the part and heat (material) lot numbers were stamped below the stock line on M14 NM rifles, e.g., 7790189 R N on TRW M14 NM serial number 1473XXX. U. S. Army and National Guard match armorers had to pass the M14 NM armorer school at Rock Island Arsenal before they were allowed to work on match grade M14 rifles. By the 1980s, the National Guard MTU established an annual M14 NM armorer school at Camp Robinson (North Little Rock, AR). At least one M14 NM, a TRW model, was issued in 2004 to a U. S. Army soldier on active duty in Iraq as a rack grade rifle.

M14 NM Distinctive Features - The receiver heels were stamped M14 NM. The NM stamping appeared just to the right of M14 or on the flat surface behind the rear sight. The major differences between the M14 NM and the M14 were: 1) NM barrel was held to half the tolerances of the rack grade barrel and was not chromium plated 2) NM rifle receiver was glass bedded to the stock 3) specific parts were hand fitted and assembled 4) NM rear sight was adjustable in ½ MOA increments through finer threads in the sight base and windage knob, and through half-turn rotation of a hooded eccentric rear sight aperture and 5) select fire parts were welded to prevent operation. The M14 NM rear sight was the same as what was used on National Match modified M1 Garand rifles. Both walnut and birch stocks have been used to build M14 NM rifles. M14 NM rifles were required to group no more than 3.5 " on average at 100 yards after three ten shot groups using M118 match ammunition. The maximum group size allowed for any single round of ten shots was 5.0 ". M14 rifles assembled by U. S. Marine Corps armorers had the forward end lug of the connector assembly removed as part of its match conditioning procedure.

M14 NM Production – The best accounting to date figures the sum of 18,466 for M14 NM rifle production from 1962 to 1967. Springfield Armory was tasked to deliver 3,000 new M14 National Match rifles by August 01, 1962 and it delivered 3,641 new National Match rifles the following year. TRW manufactured 4,874 new M14 NM rifles in 1964. Springfield Armory rebuilt 2,094 rifles in 1965 and 2,395 rifles in 1966. Rock Island Arsenal rebuilt a batch of 2,462 rifles to M14 NM configuration in 1967.

M14 NM and M21 Gas Piston - The gas piston for the M14 NM and M21 had a groove cut on the top of cylindrical portion, according to drawing number D9352724. The groove was made part of the M14 NM and M21 specifications as a result of the efforts of

Picatinny Arsenal. Civilian draftsmen and engineers from Picatinny Arsenal interviewed National Guard Marksmanship Unit shooters and armorers to develop standardized build specifications for the M14 NM and M21. From this development effort, the M14 NM and M21 rifles were given the gas piston groove and medium weight match grade barrels. Note that the NM gas piston may not always allow the bolt to move fully rearward if M80 ball ammunition is used in the rifle.

The gas piston groove equalizes the gas pressure inside the cylinder resulting in gentler stroking of the operating rod. The groove also aids in breaking vacuum so that the competition shooter can determine if the gas piston is free to move inside the cylinder by tilting the rifle up and down with the bolt held open. Members of the National Guard Marksmanship Unit, as well as some competition shooters, thought the piston groove also reduced the force impacting the operating rod. The perceived result was a smoother and more consistent cycling of the operating rod. Match armorers also polished the gas piston in M14 NM and M21 rifles with crocus cloth to reduce the friction between the gas cylinder and the gas piston. Some competition shooters had the groove cut on the bottom of the gas piston. Two very credible sources interviewed for this work favored the piston groove on the bottom for the match grade M14 type rifle. By no later than 1984, the U. S. Marine Corps Shooting Team had access to match conditioning documents that specified two grooves to be machined in the gas piston for match use.

M14 NM Operating Rod Spring Guide – The standard USGI operating rod spring guide performs its function of guiding the operating rod spring but not without noticeable binding and twisting due to its thin cross-section. This is acceptable for a rack grade M14 rifle. However, the U. S. Army MTU realized the operating rod spring guide could be improved upon as an aid to M14 NM accuracy. By no later than mid-1967, the AMTU had created the National Match operating rod spring guide. It was made of two pieces, a section of un-heat treated drill rod welded to a cutoff magazine catch portion of a USGI operating rod spring guide. The drill rod section was tapered at the forward end like the issue operating rod spring guide. The benefits were a straight operating rod spring and smoother operation of the gas system. Unfortunately, the National Match operating rod spring guide was not hardened by heat treatment after the welding procedure. Consequently, the magazine catch portion of the NM operating rod spring guide wore out much quicker than the issue spring guide.

In the 1980s and 1990s, the National Guard Marksmanship Training Unit attached the magazine catch portion to the slotted drill rod by silver soldering. This method of attachment kept the magazine catch from softening. Often, a hole was drilled through the rod and a pin inserted to secure the magazine catch as well.

Clearance between the Operating Rod Spring and Spring Guide - There is a valid concern about clearance between the M14 operating rod spring and the operating rod spring guide for two reasons: 1) combat and 2) compatibility between Chinese and US parts.

The USGI operating rod spring inside diameter can vary from a minimum of 0.340 " to a maximum of 0.354 ". Several USGI operating rod springs measured by the author measured 0.349 " to 0.350 " for the inside diameter. The inside diameter of a Chinese M14 operating rod spring measured 0.339 ". The USGI standard operating rod spring guide has dimensional requirements of 0.322 " - 0.007 " for its height where located inside the spring and 0.125 " - 0.005 " for its width. The USGI National Match operating rod spring guide will be 0.344 " - 0.005 " in diameter. Consequently, a USGI National Match operating rod spring guide may not fit inside a Chinese operating rod spring.

For combat purposes, a USGI National Match operating rod spring guide may not provide sufficient clearance with the spring where dirt and debris may collect. Some commercial manufacture National Match operating rod spring guides provide ample clearance for field use because the contour has been milled with flats or flutes. If a rifle is assembled with a military dimension National Match operating rod spring guide, an American manufacture operating rod spring should be used with it.

M14 NM Issue – Shooters were introduced to the M14 NM rifle at the 1963 National Rifle Matches. M14 NM rifles were a regular issue item at the 1964 and 1965 Matches. The M14 type rifle was popular in competition shooting until the early 1990s. The M14 was used by the U. S. Marine Corps at Camp Perry as late as 1996. However, U. S. DCM shooting clubs, such as the Alabama State Service Rifle Team and the Connecticut State Rifle and Pistol Association, still inventoried M14 NM rifles until early 2007. On January 08, 2007, the Civilian Marksmanship Program (CMP) recalled all USGI M14 rifles in the possession of state associations. The primary reason for the recall was that the small number of M14 type rifles in use for service rifle competition. The CMP recall letter cited only 4 % of the rifles used in the President’s and National Trophy Individual Matches at the 2006 National Matches were M14 type rifles. Additionally, since 1996 there had been substantial financial and staffing costs to account for missing M14 rifles loaned out to various state associations. The Civilian Marksmanship Program felt the lack of use was not meeting the purpose for which the rifles were loaned out from the U. S. Army. Hence, the recall was issued and the rifles were returned by May 15, 2007 to the CMP for safekeeping at CMP North (Camp Perry) and CMP South (Anniston, AL).

Civilian Ownership of the M14 NM - The 1980 court case, *U. S. v. One U. S. (TRW) 7.62mm M-14 National Match Rifle, Serial No. 1453711*, is worthy of mention. This federal court case was not appealed, and is not “controlling legal authority” for other situations, even within the Southern District of Ohio. Though this case applies only to this particular M14 NM rifle, it does establish that one court has determined that the M14 NM rifle as manufactured by TRW and Springfield Armory is not capable of and is not designed for automatic fire. The rifle in question was originally manufactured as a M14 National Match model, in contrast to rack grade M14 rifles converted into M14 NM configuration.

Robert Sauerman purchased the TRW M14 NM rifle serial number 1453711 in 1973 or

1974. It was not registered as a National Firearms Act machine gun. In order to set the question of the rifle's legal status to rest, Mr. Sauerman informed the Bureau of Alcohol, Tobacco and Firearms (BATF) that he was in possession of the TRW M14 NM. This TRW M14 NM was confiscated from the owner, Robert Sauerman, by the BATF on September 27, 1977 at his gun shop near Dayton, Ohio. The trial court made findings of fact that included a ruling that this TRW M14 NM was not a machine gun under the National Firearms Act, and ordered to be returned to Mr. Sauerman. The TRW M14 NM serial number 1453711 was sold by Mr. Sauerman around 1986 or 1987 to a private individual. In 2006, this TRW M14 NM was sold again to a collector. After 1987, Robert Sauerman met an untimely death when a drunk driver crossed lanes and hit him head on at a stoplight. The 1987 to 2006 owner of TRW M14 NM serial number 1453711 also possessed the court case documents.

**M15**

From 1955 to 1959, the M15 (T44E5) rifle was developed as a heavier version of the M14 (T44E4). Although a select fire weapon, the M15 was designed for sustained automatic fire using the same 7.62 mm NATO cartridge as the M14 rifle. Thus, no provision was made for launching rifle grenades. There was no spindle valve incorporated into the gas cylinder. The M15 (T44E5) weighed 15.0 pounds with sling, bipod and a full magazine of twenty rounds. The cyclic rate of fire was 725 rounds per minute. The overall length of the M15 was 45.3 " and its sight radius was 25.87 ". Its four groove 1:12 twist non-plated heavy contour barrel was 22 " long and weighed 3.5 pounds. For lubrication after cleaning, Springfield Armory specified application of a light coat oil on all metal parts except the barrel chamber and bore and surfaces contacting ammunition.

Mathewson Tool Company produced three samples of the T44E5. An unknown number of T44E4 rifles in the serial number range 1001 to 1500 were built into T44E5 models by Springfield Armory. These Springfield Armory developmental rifles were stamped T44E5 on the receiver. However, one M15 rifle had no receiver markings whatsoever.

The M15 (T44E5) had the following parts that differed from the M14: flash suppressor, barrel, gas cylinder, gas cylinder lock, front band, heavier wood stock with a different liner, heavier and triangular front sling swivel base, bipod, and a M1 Garand butt plate with a BAR hinge carefully inletted and secured with welds. Like the T44E4, the M15 hand guard was made of wood. The M15 flash suppressor had a machined surface just forward of the front sight for attaching the bipod. The bipod had eight height positions and the legs were similar to the M2 bipod. Some experimental M15 parts included a chamfered front end flash suppressor akin to the T44E4, a stock with notches and latching clips for securing the bipod feet, and a grenade launcher fitted to the muzzle coupled with an experimental bipod.

In 1956, the decision was taken to chromium plate (later known as standard contour or profile) M14 barrels. The T44E5 was tested by the U. S. Army and the U. S. Marine

Corps in 1958. During U. S. Marine Corps testing of the T44E5, a hinged butt plate and bipod were fitted and tested on a T44E4 rifle. Combined with the chromium plated barrel and slotted hand guard, the T44E4 performed satisfactorily. As a result, the U. S. Marine Corps requested a hinged butt plate and bipod for the M14. These features were adopted for the M14 the following year. Consequently, the M15 was declared obsolete in December 1959 without any USGI rifles ever stamped M15.

One commercial M15 rifle was made. Prior to May 1986, a physician in Ohio custom ordered a select fire M1A receiver from Springfield Armory, Inc. The doctor had Springfield Armory, Inc. stamp the receiver M15 instead of M1A. To this receiver he added M14 and T44E5 parts he had accumulated to create the only known M15 rifle ever built.

**U. S. Army Snipers and the XM21 and M21**

Before 1985, U. S. Army sniper schools were operated at the division or base command level. From 1956 until 1985, the USAMTU either sent out Mobile Training Teams to combat theaters to train instructors or trained them at Fort Benning, GA to staff up the sniper schools as needed. As the involvement of the Army wound down in a given conflict, the sniper schools were dissolved until the next time they were needed. After 1985, the USAMTU no longer taught sniper school instructors. Now known as the Army Marksmanship Unit (AMU), it is involved with competition shooting and small arms development. The U. S. Army sniper school at Fort Benning, GA was established about 1985 and is a separate command from the AMU. The U. S. Army five week sniper course average student failure rate was 32 % from 2000 through 2004.

The instructors trained at Fort Benning by the USAMTU were sent to the Republic of Viet Nam to establish division sniper schools beginning in June 1968. For example, the 9th Infantry Division sniper school was established at Dong Tam, Dinh Tuong, the 23rd Infantry Division sniper school was based at Chu Lai, Quang Tin and the 25th Infantry Division sniper school was located at Cu Chi, Tay Ninh. In February 1969, the 9th Infantry Division sniper school taught thirty soldiers from the 101st Airborne Division to help establish a sniper school for that division.

On a side note, one of the AMTU staff members is particularly noteworthy in M14 rifle history. Sergeant First Class Gerald “Hook” Boutin, U. S. Army (Retired) fought in World War II at the Battle of the Bulge. He was assigned to the USAMTU beginning in 1954. SFC Boutin built XM21 rifles and was a 23rd Infantry Division sniper school instructor during the American involvement in the Republic of Viet Nam. SFC Boutin was also a service rifle competition shooter. He built accurized semi-automatic M14 type rifles for civilian shooters for decades after the American military pull out from the Republic of Viet Nam. During a six week period he took on the Springfield Armory, Inc. M1A workload for Glenn Nelson while Mr. Nelson was recovering from an illness. Even in his eighties, he was bedding stocks and otherwise tuning up M14 type rifles for civilian shooters. This included putting his accurizing touch to M1A SOCOM rifles as late as August 2007.

SFC Boutin was recognized for his service to the U. S. Army and the American people by his induction into the AMU Hall of Fame on October 23, 2004. His custom built M14 type rifles leave no tell tale signature of his gifted touch other than black color bedding material if the particular stock was bedded by him.

Essentially, the XM21 and M21 rifles are M14 NM rifles equipped with optics. The XM21 weighed 11 pounds by itself and 14 pounds 5 1/3 ounces with equipment. The M14 rifle was used for sniping duty as early as 1965. The U. S. Army 11th Air Assault Division had M14 rifles equipped with M84 scopes on aluminum mounts made by the USAMTU.

In March 1967, the Army Weapons Command shipped the first 125 M84 scoped M14 NM rifles to the Republic of Viet Nam for use by Army snipers. The 101st Airborne Division had 226 M84 scoped M14 NM rifles in February 1969 while deployed in the Republic of Viet Nam. The USAMTU supported the Army sniper program in the Republic of Viet Nam beginning in June 1968 and ending in December 1970. From January 1971 until 1972 when the last major combat elements of the U. S. Army left Viet Nam, Rock Island Arsenal provided support for the XM21 rifle in that theater.

M14 NM rifles equipped with M84 scopes were in use in Viet Nam even after the XM21 with the ART scope was fielded. For example, U. S. Army Private First Class Frank William Humes carried a M14 NM rifle fitted with a M84 scope during combat missions in 1969 as a LRRP member in K Company 75th Ranger Battalion 4th Infantry Division operating in the northern highlands of the Republic of Viet Nam. On July 08, 1969, PFC Humes and two other Army Rangers were inserted behind enemy lines by rope ladder from a UH-1 helicopter. Upon landing, the three Rangers came under intense enemy fire from North Vietnamese soldiers. Regretfully, PFC Humes was mortally wounded during the fight. Reinforcements were called in to turn the tide of the battle and his body was not left behind.

U. S. Army armorers in the Republic of Viet Nam manufactured two M14 scope mounts. Both versions used steel angle iron with a machined rail secured to the top by three flat head screws. Each scope mount had a hole drilled through the vertical portion to bolt into the M14 receiver. Neither version had a vertical key to fit the receiver vertical groove. One version had a horizontal weld bead on the vertical inside surface. The weld bead was filed down to neatly fit the receiver horizontal groove. The other version had two tapped holes 1 3/4 " apart in the vertical portion of the mount. Two 3/16 " screws were threaded into the holes then filed down to rest in the receiver horizontal groove. The two screws were secured with lock pins.

At the request of Army Major General Julian Ewell, commander of the 9th Infantry Division, fifty-four automatic ranging variable power scoped M14 MTU-NM rifles were delivered to the division's sniper school in the Republic of Viet Nam on October 03, 1968. The fifty-four M14 MTU-NM rifles delivered in October 1968 were assembled by the AMTU at Fort Benning with early version Adjustable Ranging Telescopes. Known as the ART scope, these were Redfield Gunsight Co. variable power scopes modified by the Limited Warfare Laboratory. The Army Weapons Command provided an additional seventy-four M14 NM rifles equipped with the M84 2.2 X scope to the same sniper school.

The automatic ranging variable power scoped M14 MTU-NM was designated the XM21 by the U. S. Army Weapons Command at Rock Island Arsenal on September 18, 1969. This designation remained until 1972 when it became the M21. The XM21 was type classified as Standard B in December 1971. The primary reason for this classification was due to the rifle requiring armorer support. Issues related to the Sionics M14SS-1 sound suppressor, the M2 bipod and performance of the XM21 system under severe weather conditions were factors in the decision taken by the Department of the Army to classify it as Standard B.

The XM21 and M21 were both equipped with an automatic ranging variable power telescope and National Match iron sights. By no later than May 1967, M14 NM rifles were being rebuilt by Rock Island Arsenal for sniping duty. XM21 rifles were either stamped or etched XM21 on the flat surface just behind the rear sight. The selector shaft was not welded on the XM21. Conversion to XM21 configuration included accurizing and installation of a standard contour National Match barrel and marking the scope mount with the last four digits of the receiver serial number by use of a Hermes engravograph. These gunsmithing procedures were codified in late 1968 by Colonel Frank Conway when he wrote the original edition of the USAMTU Accurized National Match M14 Rifle "M14 (MTU-NM)." This document became the build manual for the XM21. Colonel Conway was the Ordnance Officer for the USAMTU at Fort Benning from 1966 to 1970. The USAMTU performed final acceptance tests on the XM21 rifles. The XM21 rifles that had passed testing were sent to Anniston Army Depot for packing and shipment to Army units in the Republic of Viet Nam. A few of the XM21 rifle stocks were camouflaged after arrival in Viet Nam. At least a few of the XM21 rifles shipped to the Republic of Viet Nam were assembled with USGI synthetic stocks.

Funding for 1,600 accurized and scoped M14 rifles was authorized by the U. S. Army Project ENSURE 240 on February 14, 1969. The U. S. Army Weapons Command at Rock Island Arsenal was tasked with building these rifles per AMTU specifications. Frankford Arsenal fabricated the scope mounts and purchased modified scopes from Redfield Gunsight Company for the project. The first 100 such rifles from Rock Island Arsenal were delivered to the USAMTU at Fort Benning in October 1969 for evaluation and adjustment. By April 1970 more than 1,300 XM21 rifles were in the hands of U. S. Army snipers in Viet Nam. Rock Island Arsenal built approximately 1,400 XM21 rifles for Project ENSURE 240.

At a minimum, scoped M14 NM and XM21 rifles were used by snipers from the 1st Cavalry Division, 1st Infantry Division, 9th Infantry Division, 23rd Infantry Division, 25th Infantry Division, 101st Airborne Division, and the Military Assistance Command Vietnam/ Studies and Operations Group (MACV/SOG) in either Viet Nam or Cambodia. The scoped M14 NM and XM21 rifles were typically supplied with 172 grain M118 match grade ammunition. However, 23rd Infantry Division snipers were sometimes given five full magazines of handloaded ammunition with 168 grain Sierra hollow point match bullets and Lake City brass by a certain enterprising instructor. The ammunition was handloaded by the sniper instructor on a bench at his "hooch." His tent was located outside the compound away from scrutinizing eyes. At the time, this type of ammunition was not authorized. Nonetheless, such ammunition worked very well for its intended purpose.

Per request from the U. S. Navy, the Army MTU built and shipped forty accurized and scoped M14 rifles to the Republic of Viet Nam in 1969 for use by sailors on river patrol boats. However, these forty M14 rifles were furnished with conventional fixed magnification scopes and not the ART scopes.

After 1970, USGI National Match standard contour barrels were no longer available for several years. Consequently, the U. S. Army Weapons Command purchased match grade barrels for the XM21 and M21 from commercial barrel manufacturers such as Douglas, Shilen and Hart. XM21 and early M21 rifles had a bedded and epoxy impregnated wood stock. XM21 rifles did not have receiver lugs. Some M21 rifles in the late 1980s were built with a rear lug under and extending behind the receiver heel. Later M21 rifles were issued with a fiberglass stock and a medium weight match grade barrel. XM21 and M21 rifles have the M14 stamping lightly ground out and the marking XM21 or M21, as applicable, engraved on the receiver heel.

Although the M24 was officially adopted in 1988, the M21 remained in service with the U. S. Army until at least March 1991. In June 1990, the 101st Airborne Division was in the process of issuing M24 sniper weapon systems at the company level to replace the M21 rifles. The M24 systems were to be issued throughout the division before any of its M21 rifles were turned in. With the pending deployment to Saudi Arabia, the decision was taken by a number of company commanders, A Company 1st Battalion 327th Infantry Regiment and others, to deploy with the M21 rifles. According to one such company commander, (later Lieutenant Colonel) John Russell, the M21 rifles “held up to the desert environment great and maintenance was not a problem.” In 1990, each rifle company in the 101st Airborne Division typically had three M21 rifles assigned to each platoon for a total of nine. On March 08, 1991, the first American troops returned home from Operation Desert Storm. In late 1992 or early 1993, the 2nd Battalion 325th Infantry Regiment 2nd Brigade 82nd Airborne Division had its nine M21 rifles removed from inventory, disassembled, and the receivers torch cut by U. S. Army armorers by orders from higher authority.

In the Republic of Viet Nam, 9th Infantry Division sniper school students were each issued a starlight scope with their XM21 rifles. The AN/PVS-1 and AN/PVS-2 models used mounting brackets that situated the scopes over the receiver but to the left of the bore centerline. The AN/PVS-1 and AN/PVS-2 scopes were first generation technology night vision devices. The Night Vision Laboratory, which was attached to the U. S. Army Electronics Command (ECOM) in 1965, began development of the AN/PVS-2 starlight scope in 1961. In 1965, ECOM was based at Fort Monmouth (NJ) and was then a subordinate command of the U. S. Army Materiel Command. The AN/PVS-1 scope had been fully developed and a U. S. Army Training Circular written for it by November 1966. It weighed 5 pounds 14.75 ounces. The AN/PVS-2 went into production under contract in September 1964 with Electro-Optical Systems, Inc. The AN/PVS-2 starlight scope replaced the AN/PVS-1 for night shooting by 1969 among U. S. Army snipers in the Republic of Viet Nam. The AN/PVS-2 was more rugged than its predecessor but weighed one pound more and was about an inch longer. The smaller AN/PVS-3 was used as early as May 1968 in the Republic of Viet Nam by American snipers as a hand-held night vision monocular for spotting enemy activity. The AN/PVS-3 weighed 3 pounds. These three night scope models were 4X magnification.

The variable power automatic ranging telescope used on the XM21 rifles was conceived by James M. Leatherwood in 1964 and developed by the Army Limited Warfare Laboratory beginning in late 1965. James Leatherwood's design improvement consisted of using a cam connected to the scope’s variable power ring to adjust the elevation as the user increased or decreased magnification until vertical stadia bracketed a known distance. This created an automatic bullet drop compensator. Leatherwood’s adjustable trajectory rifle scope ideas were patented in 1967, 1969 and 1970. The Viet Nam era Leatherwood scopes were cammed for the M80 and M118 cartridges. The Leatherwood design scope provided an easy means of obtaining center-of-mass first round hits under combat conditions. Early scope mounts used a single mounting screw developed by the USAMTU and the Limited Warfare Laboratory at the Aberdeen Proving Ground.

The Limited Warfare Laboratory at Fort Benning, GA modified Redfield Gunsight Company Accu-Range scopes for the first and second versions of the Adjustable Ranging Telescope (ART). The first version ART scopes were sent to the Republic of Viet Nam in 1967 for evaluation under combat conditions. The third version of the original ART scope was wholly manufactured by Redfield Gunsight Co. in support of Project ENSURE 240. That model became known as the ART TEL.

While on active duty in the U. S. Army, James Leatherwood made arrangements with Realist, Inc. to incorporate his automatic ranging telescope design into its fixed power Auto/Range scopes in 1968 and its variable power Camputer scopes in 1969. That same year, Realist, Inc. developed its version of the ART I scope for military use. Realist, Inc. submitted the variable power automatic ranging scope to the U. S. Army for testing. The U. S. Army tested the Realist ART I scope in 1970 but it was not adopted. The major differences between the Redfield ART TEL and Realist ART I models were the reticle design and the means of adjusting the vertical angle of the scope tube. The third version Redfield ART TEL scope had an anodized matte black finish. The Realist ART I scope was given a matte dark gray coating.

James Leatherwood left the U. S. Army as a Captain in 1969 after four years having served at the U. S. Army Infantry School (For Benning, GA) and in the Republic of Viet Nam. He worked at Realist, Inc. until early 1970. Mr. Leatherwood was then employed by Sionics, Inc. for a period of time before he and his brother, Charles, established Leatherwood Bros. (Stephenville, TX). In the first half of 1974, Realist, Inc. had decided to get out of the rifle scope business. The remaining inventory of Realist ART I scopes, ballistic cams and scope mounts were purchased by Leatherwood Bros.

The company modified the ART I design to increase service life and reliability. The Leatherwood Bros. ART II scope was developed by 1978. The ART II scope had separate power magnification and ballistic cam adjustment rings. Both Realist ART I and ART II scope tubes were made from alloy aluminum. The U. S. Army approved of this upgraded design and ordered its first purchase of ART II scopes in June 1980. Leatherwood Bros. delivered the first batch of ART II scopes to the U. S. Army in December 1981.

Various ballistic cams were available for the ART II scope according to the ammunition in use. Mounts for the ART II scope had a second mounting screw. Leatherwood Bros. produced a rear mounting block for the ART II scope mount that replaced the cartridge clip guide. For reasons unknown, U. S. Army M21 rifles did not use this rear mounting block. Instead, the issue cartridge clip guide was drilled and tapped to accept the second mounting screw. Note that the Springfield Armory, Inc. Third Generation scope mount substitute cartridge clip guide will not accept the U. S. Army ART II scope mount rear screw.

The ART I scopes were mostly replaced in 1981 and later by Leatherwood Bros. ART II scopes. Rock Island Arsenal has rebuilt ART scopes as needed. Apparently, a few ART I and ART II scopes were still in the inventory of the U. S. Army in 2004. U. S. Army Special Forces at Fort Bragg, NC in November 2004 shipped ART I and ART II scopes to U. S. soldiers in Iraq.

**M14 Product Improved Rifle**

Beginning in 1970, the U. S. Army Materiel Command funded a project at the General Thomas J Rodman Laboratory (Rock Island Arsenal) to further improve the M14 rifle. A civilian employee, Robert E. Snodgrass, headed the project. As an aside, Mr. Snodgrass developed a side two point scope mount for the M14.

Three prototype rifles for the project were produced. Each rifle weighed approximately 10 ½ pounds with sling and empty magazine. These 43 " long rifles had 24 " heavyweight stainless steel barrels, two bedding lugs, improved gas systems, laminated walnut stocks, no hand guard, hooded target grade front sight, and no select fire components including removal of the selector lug. The bedding lugs on the first prototype model were located at the front and rear ends of the receiver. The bedding lugs for the second and third prototype rifles were placed at the front of the receiver lug and the operating rod guide. The barrel on the first prototype rifle was broach cut. Remaining barrels for the M14 Product Improved Rifle project were to be made by the hammer forging method. These rifles grouped less than two minutes of angle at 100 yards with M118 ammunition. This was about a 100 % improvement over the acceptance standard of the M14 NM rifle specifications in 1975. By 1975 the funding for this project was stopped.

**XM25 and M25**

The M25 rifle is an improved version of the M21. In 1986, the 10th Special Forces Group at Fort Devens, MA had its own machine shop and ammunition reloading shop to support the unit's sniper weapon systems. While the ART II scope and side two point scope mount design were great improvements for the M21 over the original XM21 configuration, these optical systems were still prone to loss of zero when knocked around in the field. The condition of the bedding compound in the XM21 and M21 rifles deteriorated with removal of the receiver and barrel for cleaning and maintenance. The bedding compound in use at the time was also susceptible to chemical attack from various oils. Loss of the bedding material further worsened accuracy by causing the receiver to shift around in the stock.

To alleviate these problems, 10th Special Forces Group armorer Sergeant First Class (later Master Sergeant) Thomas E. Kapp, now deceased, sought to improve the M21 rifle. So, he and Master Sergeant Bill Amelung, worked with Mitchell E. Mateiko, owner of Brookfield Precision Tool, to develop the XM25 rifle between 1986 and 1988. Master Sergeant Amelung was the Non-Commissioned Officer-In-Charge of the 10th Special Forces Special Operations Target Interdiction Course. Mitch Mateiko had served in the Army National Guard and worked as a tool and die maker for the M14 project at Harrington & Richardson, Inc. Brookfield Precision Tool was located at 126-A Quaboag Street Brookfield, MA 01506. After 1996, Mr. Mateiko went on to become a law enforcement officer in Massachusetts.

Meanwhile, higher authority within the U. S. Army sought Congressional funding to change its sniper rifle from the M21 to the M24 bolt action rifle. This effort was successful with the M24 officially replacing the M21 as the sniper rifle for the U. S. Army in 1988. U. S. Army General Guest, in Congressional testimony seeking funding for the M24 rifle, was of the opinion that the M21 rifle was at the end of its usefulness as a sniper weapon system. Consequently, the development of the XM25 rifle continued quietly. The rifle produced by the 10th Special Forces Group and Brookfield Precision Tool was classified as the XM25 since the M21 was no longer considered viable by higher authority. The

10th Special Forces Group intended for the XM25 rifle to be carried by the sniper team observer in urban operations with an effective range of 600 meters. The XM25 was found to be as accurate as the M24 in the late 1980s when both rifles used M118 Special Ball ammunition. In 1991, the U. S. Army designated the XM25 as the M25. The XM25 / M25 saw combat service in Panama in 1989, the 1990-1991 Gulf War, and in Afghanistan in 2002. The M25 was not adopted throughout the U. S. Army Special Forces but it did serve admirably as the sniper team spotter's rifle in the 5th and 10th Special Forces Groups.

The M14SSR rifles were built by Naval Surface Warfare Center (Crane, IN). The U. S. Navy SEALs used the M14SSR until at least 2000. In May 2000, the U. S. Navy awarded a sole source contract to Knight's Armament Company for 300 SR-25 rifles built to its specifications. The Navy version of the SR-25 was adopted as the Mk 11 Mod 0. In late 2005, the U. S. Army had plans to replace its M24 bolt action sniper rifle with the XM110. The XM110 sniper weapon system was based on the Knight's SR-25 rifle as well. By mid-2007 the XM110 had been officially classified as the M110. The M110 began replacing U. S. Army M24 sniper rifles in early 2007.

Initially, the XM25 rifle did not mount a bipod and it was fitted with a 10th Special Forces Group made scope mount. But as adopted, the XM25 design specification required the rifle to have a synthetic material stock, a medium weight match grade barrel, a Harris bipod and the following Brookfield Precision Tool parts: steel stock liner, operating rod spring guide, scope mount, and titanium nitride coated gas piston. Various Harris bipod models were employed by Special Forces operators but over time the notched-leg swiveling bench rest height model (HBRM-S) was the typical bipod found on U. S. Army issue M25 rifles. A bipod was not always used in the field with the M25 rifle. Often, the M25 rifle was steadied with a ruck sack or a sock containing a plastic bag filled with cooked popcorn for making the shot.

The Brookfield Precision Tool operating rod spring guide was machined with four flat sides on the shaft to reduce friction with the operating rod spring and as an allowance for debris. After all, the XM25 was expected to be used in combat operations. Otherwise, the operating rod spring guide was made by the traditional means of welding a machined vice stamped magazine catch to the slotted end of the shaft. The Brookfield Precision Tool operating rod spring guide was hardened by heat treatment after welding. Consequently, these spring guides did not suffer from premature wear at the magazine catch like the AMTU models. It has the tapered forward end similar to the AMTU operating rod spring guide. A small number, one or two production batches, were not marked with the Brookfield Precision Tool name. The side three point scope mount, modified operating rod spring guide, and gas piston titanium nitride coating employed in the XM25 were innovative developments. Brookfield Precision Tool parts were not assigned National Stock Numbers.

Two side three point scope mount designs were tested by the U. S. Army for the XM25 rifle. The Atlantic Research Marketing Systems, Inc. (West Bridgewater, MA) scope mount was tested by the 82nd Airborne Division and by the 10th Special Forces Group during development of the XM25. The 10th Special Forces Group also tested a scope mount made by Brookfield Precision Tool. The U. S. Army settled on the Brookfield Precision Tool model by 1988 for the XM25 rifle specification.

Optics on the M25 varies according to unit preferences. The U. S. Army XM25 rifles were first outfitted with Leupold & Stevens, Inc. M1 Ultra and Bausch & Lomb Tactical scopes followed by Leupold & Stevens, Inc. M3 Ultra models. Army Special Forces M25 rifles today typically sport the Leupold & Stevens, Inc. M3A 10X scope. U. S. Navy SEALs have employed both Bausch & Lomb Tactical and Leupold & Stevens, Inc. 10X scopes on its M14SSR rifles. Brookfield Precision Tool also produced an adapter for its scope mount to accommodate the AN/PVS-4 night scope. The AN/PVS-4 second generation technology night scope was field tested in 1974 and later manufactured for the U. S. Army in 1980 and 1981. U. S. Army 10th Special Forces Group successfully used the XM25 fitted with AN/PVS-4 scope and Brookfield Precision Tool scope mount and adapter during Operation Desert Storm. Generation III image intensifier tubes were available for the AN/PVS-4 by 1999.

The Brookfield Precision Tool gas piston was coated with titanium nitride on the larger cylindrical diameter but not on the smaller diameter portion. Brookfield Precision Tool made two different titanium nitride coated gas pistons. Both used part number 7267047. The Revision 1 gas piston has the standard diameter gas inlet. The Revision 2 has a smaller diameter gas inlet. Only a relatively few 7267047 Revision 2 gas pistons were made. The Revision 2 gas pistons were designed for use in sound suppressed M14 type rifles. The U. S. Navy purchased 7267047 Revision 2 gas pistons for use with its suppressed M14SSR rifles. The U. S. Army and U. S. Marine Corps did not purchase the Revision 2 gas pistons. For sound suppressed M25 rifles, the U. S. Army welded and drilled the gas piston gas inlet to a smaller diameter and also drilled an approximate 0.030 " diameter hole in the center of the gas cylinder plug in order to keep the chamber pressure and the force acting on the operating rod to acceptable values.

The XM25 rifle had a steel liner placed inside the stock to allow removal of the stock without loss of scope zero. The steel stock liner was designed by Master Sergeant Tom Kapp. The design was successful because it allowed the sniper to remove the barrel and receiver from the stock, clean the weapon and reassemble the rifle without a loss of scope zero. Two U. S. Navy M14SSR rifles were built by Naval Surface Warfare Center (Crane, IN) with the XM25 steel stock liner as an experiment. However, the stock liner was time consuming to produce. Consequently, the stock liner was not kept as part of the specification for the M25 rifle. The M25 rifle, as used by the U. S. Army, typically sports either a McMillan M1A or M2A bedded stock without the steel liner and a heavyweight match grade Krieger barrel. The M25 rifle does not have a rear receiver lug. The select fire components are not welded on the M25 rifle. The selector lock is installed but can be replaced with a selector switch if desired.

**M14 SMUD**

U. S. Air Force Explosive Ordnance Disposal (EOD) units were equipped with the M14 Standoff Munitions Disruptor SMUD rifle. The M14 SMUD rifles in the inventory of the U. S. Air Force EOD unit in the Republic of Korea in 1990 had wood stocks and commercial manufacture Redfield variable 3-9X magnification rifle scopes. The M14 SMUD was assigned a separate National Stock Number from other M14 variants. It was eventually displaced by the M82A1 .50 BMG semi-automatic rifle in U. S. Air Force EOD units by 1996 or 1997. Reportedly, the M14 SMUD was also in use by U. S. Navy EOD units in 1990s. However, in June 2007, the U. S. Air Force 48th Rescue Squadron based out of Davis-Monthan AFB (Tucson, AZ) had ten M14 SMUD rifles in its inventory. These rifles had bedded oversized wood National Match stocks, chromium plated standard contour barrels, standard USGI sights, selector locks installed and traditional daylight scopes mounted on side three point mounts.

**M14 DMR**

The U. S. Marine Corps adopted a Designated Marksman Rifle and established a Designated Marksman School (Mare Island, CA) by no later than 1992. Initially, the Pacific Fleet Marine Corps Security Force Battalion was equipped with IMI Galil rifles and Nimrod scopes to serve as the Designated Marksman Rifle. The Galil rifles did not provide satisfactory service for the Fleet Antiterror Security Team (FAST) Company according to a Marine in the Weapons Platoon during this period. By 1993 or earlier, the U. S. Marine Corps chose the M14 rifle to become its Designated Marksman Rifle (DMR). The M14 DMR is classified as a precision grade, semi-automatic 7.62 mm NATO caliber rifle. It weighs 13 pounds with its issue equipment. The DMR enables the shooter to deliver accurate semi-automatic fire against multiple targets at greater distances and with greater lethality than with the M16A2. In 2003, U. S. Marines selected to become a Designated Marksman attended a four week course given at a number of Marine Corps installations such as Marine Corps Base (MCB) Quantico (VA) and Camp Lejeune (NC).

In August 1998, the U. S. Marine Corps Systems Command negotiated three sole source commercial item contracts for scope mounts and rings, barrels and stocks. McMillan Fiberglass Stocks (Phoenix, AZ) supplied 253 M2A stocks for the M14 DMR. To each M14 DMR stock, a Harris bipod was mounted under the forearm. GG&G (Tucson, AZ) provided 253 M1A1 scope mounts and 253 pairs of Sniper Grade Medium 30 mm scope rings. GG&G had shown its scope mount to the U. S. Marine Corps in 1997. More recently, Badger Ordnance supplied 30 mm scope rings for the M14 DMR. In 2003, the Precision Weapons Shop at MCB Quantico had designed and was capable of producing a scope mount for the M14 DMR.

Accuracy International is a firearms manufacturer known for its Arctic Warfare series bolt action sniper rifles. A British rifle match shooter, Malcolm Cooper, founded Accuracy International, Ltd. in 1978. Mr. Cooper went on to earn gold medals at the 1984 and 1988

Summer Olympics. In 1986, he was the 300 Meter Standard Rifle world champion. The company opened a stateside plant, Accuracy International North America, Inc., in 1997. Mr. Cooper passed away on June 09, 2001 from cancer. Accuracy International, Ltd. was sold to a new British owner in March 2005.

Cooper Precision Manufacturing (Oak Ridge, TN) was owned by Accuracy International, Ltd. (United Kingdom) and its American subsidiary, Accuracy International North America, Inc. Cooper Precision Manufacturing sold 278 barrels for the M14 DMR in 1998 to the U. S. government. Reportedly, the Cooper Precision Manufacturing barrels were found to not meet the external dimensional specifications so they were not used. Cooper Precision Manufacturing struggled financially and was finally closed down by the parent company. The remaining material stock was sold to two individuals who produced quality match grade stainless steel barrels. Mike Rock, in late 1996 and 1997, and Krieger Barrels, Inc. have supplied match grade barrels to the U. S. Marine Corps for M14 DMR rifles.

M14 DMR rifles are built at the Precision Weapons Shop, Weapons Training Battalion, Training and Education Command. The Training and Education Command is a subordinate command under the Combat Development Command at MCB Quantico. U. S. Marines trained as armorers at the Precision Weapons Shop are assigned to build and maintain accurized sniper and marksman rifles including the M14 DMR. This is all done with a modern array of Computer Numerical Control (CNC) machine tools. The Weapons Training Battalion is tasked with training scout-sniper, designated marksman, officer candidate and small arms instructor students.

The M14 DMR has sported Unertl and Leupold & Stevens, Inc. variable 3.5-10X and fixed 10X daylight scopes and the AN/PVS-4, AN/PVS-10 and AN/PVS-17 night vision scopes. The initial ammunition issued for these rifles was the M118 round but that was later replaced with the 175 grain M118LR cartridge. The M118LR round makes the M14 DMR effective to a greater distance. Some M14 DMR rifles have been equipped with OPS, Inc. combination sound suppressor and muzzle brake attachments. The M14 DMR was typically built with a Krieger Barrels, Inc. 22 " match grade medium weight barrel, McMillan M2A stock with adjustable cheek rest and butt stock spacers, stock mounted bipod, side three point scope mount and armorer fitted parts. The M14 DMR iron sights were a standard M14 rear sight assembly and a M14 NM front sight.

Every M14 DMR was required to be proof fired with one pressure test round and thirty M118 rounds of ammunition. The accuracy test for every M14 DMR consisted of a check list of items including shot grouping no more than 3 " by 3 " at 300 meters. The successful proof firing was indicated on the exterior of the barrel right hand rear end. The barrel was stamped with 1/16 " size letters in the following manner: PWS – P on the top line and the month and year below that. PWS denoted Precision Weapons Section and P meant the barrel was proof fired.

The 4th Marine Expeditionary Brigade (Anti-Terrorism) was formed at Camp Lejeune on October 29, 2001 in response to the terrorist attacks against the United States of America on September 11, 2001. The 4th MEB (AT) consisted of five subordinate commands: Marine Corps Security Force Battalion, Marine Security Guard Battalion, Antiterrorism Battalion, Chem-Bio Incident Response Force and the Foreign Military Training Unit. The 4th MEB (AT) was deactivated on February 24, 2006. The Marine Corps Security Force and Antiterrorism Battalions and the Chem-Bio Incident Response Force were reassigned to the II Marine Expeditionary Force. The Marine Security Guard Battalion was transferred to the Marine Corps Combat Development Command. The Foreign Military Training Unit became part of the newly established U. S. Marine Corps Forces Special Operations Command. During the existence of the 4th MEB (AT), the M14 DMR was issued to the Marine Corps Security Force Battalion, Marine Security Guard Battalion and the Antiterrorism Battalion. The M14 DMR rifles built in the 1990s were transferred to the 4th MEB (AT) at the request of its first Commanding General, Brigadier General (later Major General) Douglas V. O'Dell, Jr.

The M14 DMR was first used in hostile action from July through November 1993 with the FAST Company 5th Platoon in Mogadishu, Somalia in support of United States and United Nations military forces. The 26th Marine Expeditionary Unit put the M14 DMR to good use from November 2001 to February 2002 while engaged in Operations Enduring Freedom and Swift Freedom to seize Camp Rhino and the Kandahar Airport in Afghanistan. In Afghanistan, the U. S. Marines had OPS, Inc. sound suppressor and muzzle brake attachments available to them for the M14 DMR rifles. The Marines used AN/PVS-10 day/night scopes on the M14 DMR rifles and shot with M118LR ammunition. Less than two weeks before the November 07, 2004 attack on Fallujah, U. S. Marines of the Regimental Combat Team 7 were test firing the M14 DMR on a small arms range at Al Asad, Iraq.

Beginning in December 2001 until at least November 2003, a detachment from the 4th MEB (AT) provided additional security for the U. S. Embassy in Kabul, Afghanistan. The Marines occupied the roof top of the embassy round the clock in two man teams with M14 DMR rifles fitted with Leupold & Stevens, Inc. variable 3.5-10X day scopes and supporting equipment as part of the additional security provided to embassy personnel. The M14 DMR is also used by USMC Explosive Ordnance Disposal and Military Police units.

**M39 EMR**

The M39 Enhanced Marskman Rifle (EMR) is the successor to the M14 DMR. The U. S. Marine Corps field tested it in 2007. Operator and intermediate maintenance level technical manuals were written by March 2008. The Precision Weapons Shop of the Weapons Training Battalion at MCB Quantico built M39 EMR rifles from M14 DMR rifles. By early 2008, the M39 Enhanced Marksman Rifle began to replace the M14 DMR in

Marine Corps units. The most significant difference between the two rifle models is the stock. The M39 EMR is built on a late second generation Sage International, Ltd. M14 alloy aluminum chassis stock. The M39 EMR weighs 13 pounds without equipment and 16.6 pounds fully loaded. Its maximum effective range is 770 meters. The issue optical scope is a Premier Reticles Scout Sniper Day Scope secured with Badger Ordnance rings. The selector shaft is welded to the selector lug rendering incapable of automatic fire. The rate of fire is 60 rounds per minute.

**U. S. Marine Corps Scout-Snipers and the M14 Rifle**

Officially, the U. S. Marine Corps has never adopted the M14 rifle or any variant as its primary sniper rifle. Marine Corps scout-sniper schools were conducted in-theatre during the war in the Republic of Viet Nam. For example, in March 1966, the 4$^{th}$ Marine Regiment established a three week scout-sniper school at Phu Bai, Thua Thien. Marine scout-snipers in the Republic of Viet Nam were issued the pre-1964 Winchester Model 70 .30-06 caliber bolt action rifle or the M1D semi-automatic rifle. Marine snipers carried the Winchester Model 70 until December 1967. The Remington Model 700 7.62 x 51 mm bolt action rifle was first issued in April 1966. By December 1967, the Marine scout-snipers had turned in their Winchester Model 70 rifles for the Remington rifles. Since the 1970s, the Marine Corps has refined the Remington Model 700 into the M40A1 and M40A3 models. The scout-sniper nine week basic course failure rate was approximately 50 % in 2003 even though all who attend are qualified Rifle Expert.

Like the M14 DMR, the M40 series rifles were built by the Precision Weapons Shop at MCB Quantico. The present day USMC Scout-Sniper School was established in 1977. Gunnery Sergeant Carlos N. Hathcock, II was the first Non-Commissioned Officer-In-Charge. While serving as a U. S. Marine Corps sniper in the Republic of Viet Nam, Gunnery Sergeant Hathcock used a pre-1964 Winchester Model 70 bolt action rifle. Corporal John Roland Burke, (then Sergeant) Hathcock's observer during his first combat tour, carried and used an unscoped M14 rifle for each mission. Corporal Burke put the M14 rifle to good use on a number of sniper missions. Corporal Burke, assigned as Sniper Team Leader with Headquarters & Service Company 1$^{st}$ Battalion 26$^{th}$ Marine Regiment 3$^{rd}$ Marine Division (Reinforced), was later killed-in-action on June 06, 1967 during heavy fighting against the North Vietnamese on Hill 950 at Khe Sanh, Quang Tri, Republic of Viet Nam. He was posthumously awarded the Navy Cross for gallantry in combat that day.

The M14 rifle was no strange bedfellow to Marine Corps scout-snipers in the Republic of Viet Nam. 4$^{th}$ Marine Regiment scout-sniper teams of two to five carried and used select fire capable M14 rifles along with the issue bolt action sniper rifles during operations from November 1966 until at least January 1968 in Quang Tri and Thua Thien provinces. Likewise, 5$^{th}$ Marine Regiment scout-sniper team observers used the M14 rifle with devastating effect in late January and early February 1967. The sniper team observers were supporting Marine rifle companies in actions against the Viet Cong R20 Main Force Battalion in Song Thu Bon Valley, Quang Tri during Operation Tuscaloosa. The M14 rifles provided the necessary firepower to break contact with the enemy at close range. This is a useful feature of the M14 for sniper and reconnaissance teams.

The American military presence in the Philippines ceased shortly after the June 1991 eruption of Mount Pinatubo. During the two years prior to this event, the Marine Corps Barracks at Subic Bay Naval Base was authorized one billet for a scout-sniper and one M40A1 rifle. There were a number of scout-sniper school graduates on the roster of the Marine Barracks during this period. As part of their training routine, the Marine Barracks at Subic Bay conducted jungle patrols in the Philippines. In order to make use of the scout-sniper trained Marines during such operations, these particular Marines were equipped with M14 NM rifles sporting ART II scopes. These rifles worked well enough in the Philippine jungle.

**M14 Enhanced Battle Rifle**

By October 01, 2002, the M14 Enhanced Battle Rifle was officially classified by the U. S. Navy as RIFLE, 7.62MM, MK 14 MOD 0, Enhanced Battle Rifle (EBR). In acceptance testing, the Mk 14 Mod 0 shot five round groups of 12.5 " to 15.7 " at 600 yards with M118LR ammunition. It fared nearly as well with M80 ammunition. The Mk 14 Mod 0 weighs 12.4 pounds with an empty magazine, sling and plastic vertical fore grip. The vertical fore grip is secured to the six o'clock rail of the Sage International, Ltd. chassis stock. The operator's hand is protected by a thermoplastic hand guard, or fore grip, also attached to the six o'clock rail with two screws. The Mk 14 Mod 0 and Mod 1 rifles are compatible with optics used on the U. S. Army M4A1 Carbine. The U. S. Navy issued a vertical fore grip, two Badger Ordnance 30 mm scope rings, Harris bipod, a Buffer Technologies three point sling, cleaning kit, two magazines and a soft carrying case with each Mk 14 Mod 0 rifle. No optics or sound suppressors were issued with the Mk 14 Mod 0 rifles due to funding limitation.

The Mk 14 Mod 1 sports the late second generation Sage International, Ltd. M14 EBR stock with a Magpul Compact/Type Restricted (CTR) butt stock and custom cheek rest and Surefire, LLC FA762K sound suppressor. The Mk 14 Mod 1 was equipped with three storage areas, butt stock cheek rest, pistol grip and vertical fore grip. With the issue vertical fore grip but no suppressor, no bipod, and no magazine, the Mk 14 Mod 0 weighs 11.4 pounds and the Mk M14 Mod 1 weighs 10.6 pounds. The Harris bipod for the Mk 14 Mod 0 weighs 0.74 pounds. The bipod for the Mk 14 Mod 1 weighs 1.04 pounds and its Surefire sound suppressor weighs 1 pound 3 ounces.

The overall length for the Mk 14 Mod 0 is 34.9 " with the stock fully collapsed and 40.9 " with the stock fully extended. The Mk 14 Mod 1 is 37.0 " long with its stock fully collapsed as compared to 30.5 " for the M4A1 Carbine with 14.5 " barrel. The iron sights consist of an XS Sight Systems 0.125 " diameter rear sight aperture and a Heckler & Koch style hooded fixed post front sight. The cartridge clip guide is substituted with a M1913 Picatinny rail pad clip guide. Muzzle velocity is 2,675 feet per second with the M80 cartridge and 2,511 feet per second using M118LR ammunition. The Mk 14 Mod 0 is designed primarily for semi-automatic fire on point targets out to 600 yards. The rifle can be used to engage area targets out to 1000 yards. The selector switch is operable on the Mk 14 Mod 0 but the selector lock is installed on Mk 14 Mod 1 rifles.

For optics, the Mk 14 Mod 1 was fitted with a LaRue Tactical LT 608 scope mount, Nightforce 0.885 " scope rings and Nightforce NXS 2.5-10X scope. The scope mount prototype for the Mk 14 Mod 1 was designed by NSWC Crane but production was out sourced to LaRue Tactical (Leander, TX). With its issue optics, sound sound suppressor and match tuned firing mechanism, the Mk 14 Mod 1 can fill the Designated Marksman Rifle role. In acceptance testing for the U. S. Navy, the Mk 14 Mod 1 rifle typically grouped 1.7 " per five rounds of M118LR ammunition at 100 yards.

Development of the M14 EBR - Mike Rock started Mike Rock Rifle Barrels, Inc. in 1978. He made National Match and DMR barrels for the U. S. Marine Corps in the 1990s. After some financial struggles and losing his business, Malcolm Cooper hired Mike Rock to make barrels. After Mr. Cooper passed away in June 2001, engineers Jim Ribordy and Mike Rock teamed up as RD Systems (South Beloit, IL). In 2000, Rock Creek Barrels (Albany, WI) was formed. Rock Creek Barrels, Inc. is owned and operated by Mike Rock and Kim Theiler. Mike Rock produces single point cut rifle barrels. Kim Theiler manufactures pull button rifle barrels. To date, Mike Rock has personally fired over 1,000,000 rounds through firearms. He holds a Master's degree in Mechanical Engineering and an honorary Doctorate in Metallurgical Engineering.

About 2001, Mike Rock was asked by U. S. Army Lieutenant Colonel Gus Taylor at Naval Surface Warfare Center Crane, IN to participate in the SOPMOD Conference at Fort Benning, GA. SOPMOD is a military acronym for Special Operations Peculiar Modification. This term is used to denote that a weapon system has been modified for use by the U. S. Special Operations Command. Mike Rock was the sole barrel maker invited to this conference. Colonel Taylor asked Mike Rock to design a shortened M14 rifle. A contract was signed with NSWC Crane and the project began. As part of the project, Mike Rock was given ten M14 rifles to be used to develop the SOPMOD M14. Mr. Rock thought about the M14 design and how to improve upon it. He came up with the idea to reorient the gas system so that it was in line with the bolt roller. He made a wood mock up at first. It showed to be very promising so further development work was done. Malcolm Cooper and Mike Rock sketched out a "V" block two half stock for an Accuracy International bolt action rifle. This is where the concept of the two half synthetic stock originated. Mike Rock then measured and machined a prototype two half stock that had a wooden fore end with an aluminum channel. After this, Colonel Taylor informed Mike Rock that a collapsing stock was desired for the SOPMOD M14.

Mike Rock then created an aluminum stock body with steel telescoping rails. It allowed the barrel and gas system to float freely. The redesigned SOPMOD M14 gas system pushed directly in line with the bolt roller and reduced barrel whip. This gas system has been patented by Mike Rock under RD Systems. The original USGI M14 barrel was replaced with a 1:11.27 twist five radial groove heavy pull button barrel. Barrel twist rate is defined as how far the bullet must travel down the barrel before it has spun one revolution, e.g., 1:10 means a bullet will turn one revolution for every 10 " of barrel length. A faster twist rate is generally used to stabilize heavier and longer bullets in flight.

It was found through testing that acceptable accuracy could be maintained with as short a barrel as 11 " with this design but the noise level was excessive. All of this work was done by Mike Rock and Jim Ribordy working together at RD Systems. Jim Ribordy hand delivered the prototype SOPMOD M14 to Colonel Taylor at NSWC Crane, IN. Mike Rock's SOPMOD M14 was tested at Fort Campbell, KY by a U. S. Army 5$^{th}$ Special Forces Group soldier. It was also test fired by Colonel Taylor. The results were impressive. Initially, OPS, Inc. designed sound suppressors were used in concert with the SOPMOD M14. These SOPMOD M14 sound suppressors were manufactured by RD Systems. For whatever reasons, this design was not adopted for military use by NSWC Crane but it was available in the commercial market until October 2006.

In the summer of 2002, NSWC Crane supplied a stock design to Sage International, Ltd. Sage International, Ltd. produced alloy aluminum stocks for evaluation. The 2002 NSWC stock design included ambidextrous sling attachment points and full length six and twelve o'clock Picatinny accessory rails. A M203 grenade launcher was installed on a M14 EBR and tested. The loaded M203 added just too much weight to the front end of the system to make it practical. Consequently, the grenade launcher did not become a part of the design specification. However, the M14 EBR with M203 was a significant improvement over the 1960s SPIW models.

NSWC Crane tested the 2002 production M14 EBR stocks with 16 " and 18 " barrels. The 18 " barrel with a 1:11 twist was chosen for the evolving M14 EBR configuration. Later, the thermoplastic hand guard, combination gas cylinder lock hooded post front sight and direct connect style flash suppressor were added to the system specification. The direct connect flash hider was chosen in anticipation of easily attaching possible future sound suppressors for the Mk 14 Mod 0 rifles. In 2003, Smith Enterprise, Inc. first built its prototype M14 Enhanced Battle Rifle for consideration by the U. S. Navy. It was favorably received. By no later than August 2003, NSWC Crane had concluded its design specification for the M14 EBR.

The M14 EBR is built on a USGI M14 receiver with enhancements including, but not limited to, a fully adjustable stock, a 18 " standard contour molybdenum-chromium alloy barrel, enlarged rear sight aperture, and Smith Enterprise combination gas cylinder lock front sight, direct connect flash hider and extended bolt lock. The extended bolt lock allows the bolt to be released the same way as on M16 type rifles. M14 EBR scope rings allowed the use of iron sights with the scope installed.

Springfield Armory, Inc. was awarded a contract to supply the machined and finished Mk 14 Mod 0 barrels to NSWC Crane. Wilson Arms Company (Branford, CT) supplied the barrel blanks to Springfield Armory, Inc. These standard contour 1:11 twist 18 " barrels were not chromium plated. The barrel gas port was drilled using a # 45 bit and the gas cylinder shoulder boss was moved forward about 0.62 " because of the lack of a gas system front band on the Mk 14 Mod 0. The M14 EBR weighed 11 pounds 10 ounces with a 22 " barrel but no optics or vertical fore grip when evaluated by *Armed Forces Journal* at its February 2004 Shoot-out. The M14 EBR tested by *Armed Forces Journal* was equipped with the black color steel wire telescoping version of the Sage International M14 EBR stock.

In February 2005, the U. S. Navy's proposed funding for the M14 EBR (Mk 14 Mod 0 and Mk 14 Mod 1) purchases was as follows: FY 2008 - $1,772,000 for 886 rifles, FY 2009 - $1,782,000 for 886 rifles, FY 2010 - $1,772,000 for 886 rifles and FY 2011 - $1,772,000 for 886 rifles. The following year, the acquisition was scaled back dramatically. In February 2006, the U. S. Navy budgeted $536,000 for 233 rifles in FY 2006 and $553,000 for 233 rifles in FY 2007 for the newer variant, Mk 14 Mod 1. In 2005, Smith Enterprise, Inc. developed a barrel for evaluation by NSWC Crane for the M14 EBR project. This AISI 4140 alloy steel chromium plated standard contour barrel was 18 " in length, had a 1:10 twist and was chambered for the M118LR cartridge and was headspaced for USGI M14 receivers. Due to budgetary constraints, the SEI barrel was not adopted for the Mk 14 Mod 1. Smith Enterprise, Inc. is supplying parts to NSWC Crane as requested in support of the M14 EBR project.

The U. S. Navy SEALs were able to field the Mk 14 Mod 0 by no later than the first half of 2005. The Mk M14 Mod 0 rifle is dressed in the second generation lightweight gray color version of the Sage International, Ltd. M14 EBR stock. In the second half of 2006, NSWC Crane was building Mk 14 Mod 1 rifles. In May 2007, NSWC Crane was interested in evaluating match grade barrels, additional gas system tuning and round shaft operating rod spring guides to improve accuracy for the Mk 14 Mod 1 rifle.

M14 T Rifle - On February 26, 2003, the U. S. Coast Guard was transferred from the Department of Transportation to the newly created Department of Homeland Security as part of the Homeland Security Act of 2002. In response to the change in its mission statement, the U. S. Coast Guard began, among other initiatives, a small arms procurement program to replace its hand guns, add additional machine guns, and replace or add to its stable of rifle systems. Two Coast Guardsmen were sent in 2004 to the 4th Marine Expeditionary Brigade Designated Marksman school at Camp Lejeune, NC as one small part of a branch wide training effort to support the Coast Guard's new mission.

The M14 EBR was evaluated in 2004 to become the U. S. Coast Guard M14 Tactical rifle. The U. S. Coast Guard requirement for the M14 EBR differs from the Navy version in that the direct connect flash hider is replaced with a Smith Enterprise, Inc. muzzle brake. The U. S. Coast Guard is more concerned with minimizing muzzle rise from use on a rolling deck than eliminating muzzle flash. The muzzle brake manufactured for the M14 Tactical rifle is marked U.S.C.G. SMITH ENT. By 2005, the U. S. Coast Guard had procured 500 M14 Tactical rifles. The U. S. Coast Guard type classified this model as the M14 T. Its intended role was to arm Coast Guard helicopter crews to fulfill its new counterterrorism role. The M14 T was expected to see service with the U. S. Coast Guard until 2015.

M14 EBR-RI - In 2008, the U. S. Army Tank Automotive Command (TACOM) began a project to modernize the M14 in support of U. S. Army units in Iraq. This work was performed by the Weapons Product Support Integration Directorate of the TACOM Life Cycle Management Command at Rock Island, IL. The first 400 M14 Enhanced Battle Rifle - Rock Island (M14 EBR-RI) rifles had been completed by June 2008. Another 2,200 units had been completed under contract by March 2009. The conversion of a M14 to a M14 EBR-RI includes replacing the traditonal stock with a Sage International late second generation M14 EBR stock, replacing the cartridge clip guide with a Sage International M14 DCSB detachable cantilevered sight base (Sage part number M14DCSB), and adding a Sage International SOPMOD vertical grip (Sage part number 4249), a Harris bipod and a Leupold & Stevens, Inc. variable 3.5-10X day scope. The acceptance criteria was a maximum of 1.5 MOA with the result averaging 0.82 MOA for the 2,600 built to that date.

**M14SE, Mk14 SEI and M80 SDM**

M14SE - The M14 rifle as a sniper weapon system has been successful but it has had its minor shortcomings. The M14 rifle is a sound and proven weapon but glass bedding, steel inserts, and gas system unitizing requires armorer support. The flash suppressor nut and setscrew arrangement affect barrel performance. Installing a sound suppressor to the USGI front sight housing is not the most rugged means of attachment. The USGI bolt lock can be difficult to manipulate with thick gloves. Ron Smith of Smith Enterprise, Inc. has examined the barrel-to-receiver interface, the optics, the barrel itself, the gas system, the flash suppressor and sound suppression of the M14. He has developed simple and reliable solutions to these nagging deficiencies while taking advantage of current technology. The result is the M14SE semi-automatic rifle system. This development work had been completed before 2004. Until mid-2006, the weapon was known as the M14SE Semi-Automatic Sniper System. At that point, the rifle system was billed as the M14SE Squad Designated Marksman (SDM) rifle without any component changes. Per U. S. Army doctrine, a 7.62x51 mm sniper rifle is capable of engaging targets out to 900 meters and a squad designated marksman rifle is intended for use against the enemy at distances to 600 meters.

In May 2004, the U. S. Army 2$^{nd}$ Infantry Division 2$^{nd}$ Brigade Combat Team was preparing to deploy from South Korea to Iraq. The U. S. Army had noted that many soldiers were making individual purchases of Smith Enterprise, Inc. scope mounts and scope rings for their issued M14 rifles. Major Kim Zimmerman from the 2nd Infantry Division approached Leupold & Stevens, Inc. to acquire some scopes, mounts and rings for twenty of the division's 110 M14 NM rifles in anticipation of pending deployment to Iraq. Leupold & Stevens, Inc. assisted Major Zimmerman in acquiring the requested parts but also made him aware of Smith Enterprise, Inc. and its capabilities.

Over the course of the following month, Major Zimmerman was in constant communication with Smith Enterprise, Inc. They discussed at length the needs of the 2nd Brigade Combat Team of the 2nd Infantry Division and what could be done with its M14 NM rifles to meet those needs. In general terms, the 2nd Brigade Combat Team was in need of accurate, rapid fire, heavy fire power sniper rifles for engaging enemy targets at medium and long range distances. Major Zimmerman briefed the 2nd Infantry Division Commanding General, Major General George A. Higgins, on what Smith Enterprise, Inc. was able to do. Major General Higgins immediately saw the merit in converting the M14 NM rifles and gave quick approval. Major Zimmerman wrote the sole source contract and Major General Higgins awarded it to Smith Enterprise, Inc. in July 2004 without either officer having seen a M14SE rifle. Major General Higgins was able to award the contract because the M14SE is a proprietary shooting system and the M14 NM rifles are owned by, not on loan to, the 2nd Infantry Division. This is the first time that an entire U. S. Army unit has adopted a sound suppressed sniper weapon system.

At about the same time in May 2004, the U. S. Army was getting ready to release the requirements for the XM110 sniping system. The XM110 is a gas operated semi-automatic 7.62 x 51 mm caliber sniper rifle. Smith Enterprise, Inc. briefed the U. S. Army Director of Combat Development (Fort Benning, GA) on the M14SE. The Director of Combat Development was convinced that the XM110 requirements could be met by the M14SE and save the taxpayer money by converting an existing weapon. Rock Island Arsenal was also briefed and convinced of the merits of the M14SE. The Director of Combat Development and Rock Island Arsenal were both well aware of the 2nd Infantry Division's pursuit of the M14SE during all of this. In 2005, additional U. S. Army units had ordered conversion of M14 rifles to the M14SE configuration.

Smith Enterprise, Inc. received 110 M14 NM and XM21 rifles from the 2nd Infantry Division in late September 2004 by U. S. Air Force transport direct to Luke AFB from South Korea. These M14 NM rifles were in poor condition. The operating rods were coated in rust and dirt filled the rear sight pocket under the rear sight assemblies. There were broken elevation pinions, cracked wood stocks, and flash suppressor nut setscrews and gas cylinder plugs all chewed up. One wood stock broken in half was held together by a tent stake and tape. Nonetheless, the conversion project was completed per the contract. The M14SE rifles were picked up by the U. S. Air Force at Luke AFB and flown directly to Baghdad, Iraq. As delivered, optics for the 2nd Infantry Division M14SE rifles were either Leupold & Stevens, Inc. variable 3.5-10X40 mm illuminated reticle or 1.5-

5X20 mm illuminated reticle scopes as required by the contract. Later, the 2nd Infantry Division replaced the 1.5-5X20 mm scopes with the 3.5-10X40 mm scopes so that all M14SE rifles were fitted with the higher magnification scopes which better suited its needs. The combination gas cylinder lock front sights installed on the 2nd Infantry Division M14SE rifles are marked 2 I. D. on the top line and O. I. F. on the bottom line.

To convert the M14 into the M14SE the heart of the weapon (receiver, bolt and operating rod) is kept but everything else is changed out. Highlights of the M14SE configuration include the following modifications: 1) synthetic USGI stock without lugs or bedding 2) 22 " medium weight molybdenum-chromium alloy 1:10 twist four groove barrel chambered for M118LR ammunition 3) the receiver, new barrel and bolt are each cryogenically treated separately 4) the gas cylinder, gas cylinder plug, and front band are nitrocarburized 5) gas system is unitized 6) gas piston is high density hard chromium plated 7) SEI MIL-STD-1913 scope mount and SEI 30 mm heavy duty tactical tall ring set 8) choice of Leupold & Stevens, Inc. rifle scope models 9) waterproof strap-on nylon cheek rest with polyvinyl chloride inserts 10) SEI M14DC direct connect flash hider 11) SEI dovetail or hooded style nitrocarburized combination gas cylinder lock front sight 12) SEI extended bolt lock 13) tuned 4.5 pound pull firing mechanism 14) SEI wire electro-discharge machined from bar stock rear sight assemblies and 15) manganese phosphate coating to military specification. The selector shaft on the M14SE rifle is inoperable rendering it semi-automatic fire only.

Each M14SE is carefully assembled and lubricated with MD Labs XF7 weapons lubricant. Optional accessories include: 1) 18 " M14SE medium weight barrel 2) adjustable firing mechanism 3) M1907 leather or synthetic sling 4) quick detaching sound suppressor 5) angle cosine indicator and mount 6) model GLFS-T combination gas cylinder lock dovetail style front sight with tritium insert 7) magazine pouch 8) nylon suppressor and tool pouch and 9) AN/PVS-22 scope mount.

The tactical tall heavy duty rings are used to keep the combination gas cylinder lock front sight from obscuring the shooter’s view through the scope. The barrel for the M14SE was started with the June 1981 U. S. Army Armament Research Development and Engineering Center (Dover, NJ) drawing F9345206. This is the blueprint for the medium weight contour M14 National Match barrel. However, Smith Enterprise, Inc. has improved upon this barrel by giving it a 1:10 twist instead of 1:12 and chambering it for the M118LR cartridge. M80, M852 and M118LR ammunition all shoots well from this barrel.

The first batch of M14SE barrels were stamped WA 9345206 9/04. Beginning in May 2005, the 18” long M14SE medium weight barrel became available. On September 28, 2005, Smith Enterprise, Inc. successfully concluded its M14SE system contract with the U. S. Army 2nd Infantry Division. A majority of the rifle serial numbers built into M14SE rifles for the 2nd Infantry Division are listed as follows:

Harrington & Richardson - 825699, 827540, 837104, 837757, 837803, 837860, 839464, 856413, 858817, 868912, 873853, 873945 (heel marked XM21), 876234, 953634, 964390

Springfield Armory - 3589, 335291 (heel marked XM21), 347246, 348984, 349654, 353253, 354444, 354510, 355234, 356298, 356589, 356784, 356895, 357134, 357241, 357413, 357730, 359560, 362252, 362924, 524984, 525312, 526573, 528960, 529279, 534730, 534832, 537434, 537462, 538272, 542954, 544351, 550698, 550866, 555371, 559038, 560780, 1593532, 1594461, 1596100, 1596406

TRW - 1440568, 1442083, 1453205, 1453297, 1453321, 1453461, 1453979, 1454083, 1454095, 1454371, 1454649, 1467176, 1467233, 1478979, 1479013, 1479182, 1479394, 1479525, 1495814, 1495894, 1496080, 1496159, 1496203, 1496247, 1499569, 1500020, 1500072, 1500075

Winchester - 175935, 179514, 191069

M14SE Phase II – Several enhancements to the M14SE and Mk 14 SEI systems were implemented in the spring of 2005. USGI contract trigger and hammer pins made in the 1960s were heat treated to a hardness in the low 40s HRC. With extended use, these pins will wear into an oblong shape causing noticeably inconsistent hammer and trigger operation. Consequently, all M14SE and Mk 14 SEI rifles are now fitted with Smith Enterprise, Inc. proprietary S-7 alloy steel trigger and hammer pins hardened to about 58 HRC. The result is a lifetime of use and consistent firing mechanism performance. The M14SE barrel gas ports were slightly enlarged as further assurance that all types of 7.62x51 mm ammunition will work with the direct connect sound suppressor under all weather conditions. The USGI M14 connector lock was replaced with a Smith Enterprise, Inc. proprietary design unit made from S-7 alloy steel. The USGI operating rod and hammer springs are replaced with SEI designed and manufactured chromium silicon alloy steel springs. The operating rod guides are sized perfectly to the M14SE and Mk 14 SEI barrels. The Smith Enterprise, Inc. 7 " long scope mount, steel bipod and optical upgrades were offered as well. The SEI bipod design was changed by the fall of 2007 to include a locking cant.

In June 2006, Smith Enterprise began work on another M14SE contract. Twenty-six worn out USGI M14 rifles were rejuvenated and sent back within thirty days as M14SE SDM models to the U. S. Army 502nd Infantry Regiment 101st Airborne Division in Iraq. Each 101st Airborne Division M14SE rifles was assembled with a Krieger M14 DMR medium weight stainless steel match grade barrel, SEI MIL-STD-1913 Tri Rail mount, Leupold & Stevens, Inc. Mark 4 3.5-10X40 mm illuminated reticle scopes, SEI quick detaching MIL-STD-1913 bipod, and an advanced version M14DC sound suppressor. The Krieger M14 DMR barrels were used because the M14SE medium weight molybdenum-chromium alloy steel barrels were temporarily unavailable during the short turnaround time requirement of this build project. The M14 rifle serial numbers that were rebuilt for this project were: 170319, 171313, 175999, 355875, 528859, 549187, 552306, 564323, 610752, 611025, 680376, 848756, 852406, 855400, 861460, 864536, 907265, 1008635, 1011788, 1013478, 1042090, 1159987, 1231116, 1453988, 1476541, and 1499648.

Smith Enterprise, Inc. also built some M14SE rifles in 2006 for the 25th Infantry Division while serving in Iraq. In the second half of 2006 or 2007, Smith Enterprise, Inc. rebuilt twenty-three M14 rifles for the 4th Battalion 9th Infantry Regiment 4th Brigade Combat Team 2nd Infantry Division in support of its deployment to Iraq in early 2007.

In September 2006, the SEI AN/PVS-22 scope mount was made available for law enforcement, foreign military and U. S. government sales. The AN/PVS-22 scope is a third generation night vision sight designed for ease of use in the field. It was designed and developed by Optical Systems Technology, Inc. in 1996. The SEI AN/PVS-22 scope mount is unique in that is of a cantilever design. It attaches at one point at the front of a MIL-STD-1913 Picatinny rail side three point scope mount. The SEI AN/PVS-22 scope mount is manufactured by the wire EDM method from AISI 4140 molybdenum-chromium alloy steel. It is nitrocarburized to 60 HRC. The advantage of this design is keeping the scope mount for a night vision optic from touching the barrel.

In March 2007, three USGI XM21 rifles had been rebuilt into M14SE configuration and shipped to the U. S. Army. By July 2007, the U. S. Army designated the M14SE as the M21A5/C-IED. C-IED is an acronym for counter-improvised explosive device. As of February 2008, a M80HT (proprietary nitrocarburizing process) treated M14SE test barrel had 15,000 rounds of M118LR through it while still producing acceptable results. The proprietary M80HT process allows a match grade barrel to have the longevity of a chromium plated barrel while maintaining acceptable accuracy.

On March 28, 2008, the M21A5/C-IED rifle was tested at Fort Benning, GA. The test rifle for the M21A5/C-IED rifle was built by Smith Enterprise, Inc. using a LRB Arms M14SA receiver. Otherwise, the test rifle was built to the same specifications as would have been done for a U. S. military owned model. The test M21A5/C-IED rifle printed a five shot 3/4 " group at 100 yards using M118LR ammunition. With the same lot of ammunition, the M21A5/C-IED test rifle grouped less than 10 " at 1000 yards.

Mk14 SEI - In 2004, Smith Enterprise, Inc. converted a number of M14 rifles for U. S. Air Force pararescue teams into a variation of the M14SE system unofficially known as the Mk 14 SEI. These rifles were assembled with the Sage International, Ltd. M14 EBR stock in lieu of the USGI M14 synthetic stock. The top rail of the Sage International, Ltd. M14 EBR stock had to be modified for installation of the Smith Enterprise, Inc. scope mount as part of the build specification. The U. S. Air Force rifles were fitted with 18 " medium weight M14SE barrels chambered for the M118LR cartridge. The selector switch was left operable.

The chromium plated 18 " barrel (SEI part number 2027) was an option for the Mk 14 SEI system. The U. S. Air Force pararescue teams reported successful engagement of targets out to 900 yards with Mk 14 SEI systems fitted with Leupold & Stevens, Inc. 3.5-10x40 mm illuminated reticle scopes. In the summer of 2005, the U. S. Air Force contracted with Smith Enterprise, Inc. to convert 100 M14 rifles into Mk 14 SEI systems. Like the M14SE, the Mk 14 SEI was designed to fill the U. S. Army requirement for the XM110 semi-automatic sniper system.

Smith Enterprise, Inc. (SEI) converted two U. S. Army 10th Special Forces Group Chinese select fire M14 rifles converted during the fall of 2004 to Mk 14 SEI rifles. The Chinese M14 chu wood stocks with selector cutouts were replaced with Sage International, Ltd. M14 EBR stocks. These two Chinese select fire M14 rifles are not registered under the National Firearms Act since that law does not apply to military property. The only marking, M14, was stamped on the heel of each Chinese select fire receiver. The selector switch was left operable on these two Chinese M14 rifles when returned to the U. S. Army 10th Special Forces Group.

M80 Squad Designated Marksman (SDM) Rifle - Smith Enterprise, Inc. developed the M80 SDM in 2006 for the U. S. Army. This was a M14SE rifle outfitted with a special profile 18 " non-plated M80HT treated barrel, a shorter length-of-pull USGI synthetic stock and a Leupold & Stevens, Inc. moderate variable power scope.

**Semi-automatic Only USGI M14 Rifles**

Three semi-automatic only M14 receivers were manufactured at the Springfield Armory between January 01, 1962 and March 20, 1962. Two of the receivers were assembled into complete rifles. These semi-automatic only rifles differed from the standard M14 in the following manner: 1) no selector lug or operating rod rail cuts for the connector 2) M1 Garand design operating rod dismount notch 3) no stock selector cutout 4) M1 Garand butt plate on the stock 5) no spindle valve in the gas cylinder 6) no connector-tripping notch in the operating rod 6) M1 Garand sear installed in the firing mechanism 7) ten round magazine in lieu of a twenty round magazine 8) M1 Garand rifle National Match rear sight assembly 9) non-plated match grade barrel. These semi-automatic M14 receivers were numbered X500, X501 and X502. X500 remained at Springfield Armory as a bare receiver for the time being. Receivers X501 and X502 were assembled into complete rifles.

These two rifles were examined by the Chief of Army Field Forces, the Director of Civilian Marksmanship and the Department of Treasury. The Department of Treasury concluded that these rifles were suitable for sales to civilians. Major General Nelson M. Lynde, Jr., Assistant Chief of Ordnance for Field Services, decided that these modifications deviated too far from the original design. These semi-automatic M14 rifles could not be converted back to the issue rifle in the event of a national emergency. Thus, the project was abandoned after General Lynde’s visit to Springfield Armory on March 28, 1962.

Disposition of these three receivers is unknown though M14 rifle serial number X502 was observed at Camp Perry in the 1960s. General Lynde went on to become Commanding General of the Ordnance Weapons Command (later Army Weapons Command) from May 1962 to March 1964.

**Hahn Machine Company and Pearl Manufacturing**

From at least 1990 until 1995 or later, Hahn Machine Company (St. Charles, MO) legally manufactured semi-automatic only M14 rifles by cutting and welding pieces from scrapped USGI M14 receivers. This was done according to a letter of approval signed by then BATF Chief, Firearms Technology Branch, Edward M. Owen, Jr. dated June 8, 1994. The letter was addressed to Mr. Lloyd Hahn of the Hahn Machine Company in St. Charles, MO. It was the BATF response to Mr. Hahn's May 11, 1994 submission of a modified USGI TRW M14 receiver for a BATF ruling on the assembly of a semi-automatic only USGI M14 receiver. The approval letter granted permission to manufacture semi-automatic only M14 receivers from "properly destroyed" USGI M14 receivers. The destruction procedure first required a specific torch cut procedure on the receiver followed by removal of the selector lug and weld fill in of the operating rod rail cuts. After these steps were completed, the pieces of receiver scrap could be welded into one piece. The letter also required Hahn Machine Company to permanently engrave the company name, city and state on the receiver. A second letter from the BATF dated March 22, 1995 and signed by Technical Section ATF Specialist Naomi L. Rubarts was the cover document for an approved Application for Registration for Tax-Free Transactions as a manufacturer.

The following is presented strictly for providing the reader with a historical perspective regarding civilian ownership of M14 type rifles in the United States. The June 8, 1994 BATF letter to Lloyd Hahn was consistent with a previous letter mailed to Martin Pearl of Grants, New Mexico dated August 21, 1980. In the letter to Mr. Pearl, Edward M. Owen, Jr. stated that the "manufacturing of firearms from properly destroyed (demilitarized) firearm receivers is an acceptable practice" as long as "the first stage of your manufacturing process be the removal of the selector pivot housing" and this "modification will remove the new receivers from the provision of the National Firearms Act." As an aside, Martin Pearl (SOT/FFL Pearl Manufacturing) went on to register and convert thirty-two Maadi AKM and two Valmet M78 rifles to select fire capability. He did these conversions for the 1984 film classic, *Red Dawn*.

Warning: Since the mid-to-late 1990s, the Bureau of Alcohol, Tobacco, Firearms (and Explosives) has not interpreted 26 U. S. Code section 5845 (b) to allow welding of USGI M14 receiver halves back together even if all select fire features are removed. The BATFE considers such activity as manufacturing of a machine gun. The reader is strongly encouraged to NOT attempt any restoration of demilitarized USGI M14 receivers. Machine gun manufacture by a private individual in the United States is a felony and the offender is subject to severe criminal penalties.

The receivers were heat treated after all welding operations had been completed. The quality of the welding on Hahn Machine receivers is reputed to be very good. Bruce Dow of Dow Arms Room (Dade City, FL) has examined four Hahn Machine welded semi-automatic M14 rifles. He found that none of the four Hahn Machine welded M14 receivers met the USGI drawing 7796081 receiver straightness requirement, within 0.010 ". However, three of the four Hahn Machine welded M14 receivers were straighter than two commercial M14 type receivers. All six of these receivers functioned perfectly as part of complete rifles. One of the four Hahn Machine receivers had its bridge located too far aft. The number of Hahn Machine welded semi-automatic M14 receivers is unknown but is thought to be in the hundreds.

In the 1990s thousands of demilitarized USGI M14 receiver halves were auctioned off by the government. These receiver halves have been sold by surplus to collectors as momentos. As is, the BATFE considers the demilitarized receiver halves as scrap metal. Such, apparently, was not always the case. In November 1972, Thomas A. Buss telephoned the BATF and spoke with two field agents, Mr. Barnes at the Cincinnati, OH office and Mr. Mayer at the Philadelphia, PA office. Mr. Barnes told Mr. Buss that,

> any piece of a machine gun receiver - no matter how small or worthless - must be registered as an unserviceable firearm. If not already registered, there is no provision for registering except during an amnesty period. The present owner's only recourse is abandonment to the government without penalty.

Mr. Buss was informed by Mr. Mayer,

> If enough metal is missing so that the pieces cannot be rejoined, send a photograph or a good sketch to DIRECTOR, BATF, 1111 Constitution Ave. Washington, D.C. 20226. The director personally will decide whether the pieces will be registered or the pieces will be confiscated. Pending the director's ruling, the pieces should be held by a Class III dealer.

**U. S. Civilian Ownership of Select Fire USGI and Chinese M14 Rifles**

There are several hundred National Firearms Act (NFA) registered USGI select fire M14 rifles (including legally welded USGI receivers) in the United States according to an ATF Agent who conducted an audit of the NFA Registry. The Agent conducted the audit with the specific purpose of determining the number of USGI M14 rifles in the Registry. Most of the NFA Registered select fire M14 receivers have been welded back together. Welded USGI M14 receivers were registered under the National Firearms Act by approved ATF Form.

There were likely a few uncut USGI M14 rifles among the tens of thousands of machine guns registered when the National Firearms Act was revised in 1968. One such amnesty example is Harrington & Richardson M14 serial number 449955. The NFA amnesty period ran from November 02, 1968 to December 01, 1968. At least two Springfield Armory T44E4 rifles made it into the NFA Registry under the amnesty and forty years later remain in the hands of private citizens.

In late 1985 or early 1986, Harrington & Richardson registered a group of twenty-five to thirty, possibly more, Harrington & Richardson M14 rifles and a handful of the Harrington & Richardson .22 LR caliber M14 Simulator rifles with the BATF. These M14 rifles had never left the factory and were registered in time to become legal for civilian possession before the 1986 McClure-Volkmer Firearms Owner Protection Act ended any further legal registration of automatic capable firearms for civilian purchase. They were auctioned off when Harrington & Richardson went out of business.

One of the soon-to-be auctioned M14 rifles, serial number 87156, was transferred by Harrington & Richardson Arms Co. to Qualified Manufacturing (Broken Arrow, OK) on November 02, 1985 by approved ATF Form 2. Qualified Manufacturing was a Class 2 FFL/SOT firearms manufacturing business reportedly owned by Richard Parker. Qualified Manufacturing submitted an ATF Form 2 to return M14 serial number 87156 to Harrington & Richardson on November 14, 1985. The BATF approved the Form 2 on December 05, 1985. Based on this sequence of events, the Harrington & Richardson Arms Co. auction likely occurred soon after December 05, 1985. Robert J. Perry purchased these H&R M14 and M14 Simulator rifles in April 1990 from the anonymous winning bidder of the Harrington & Richardson auction. Subsequent to the passing of Mr. Perry, the Harrington & Richardson rifles were sold to other individuals.

Most of the Harrington & Richardson M14 rifles were test models, experimental Guerilla Gun M14 models or machined receivers that had never been heat treated. Some had no scope mount boss and threaded bolt hole on the left hand side while others were barreled actions or only partially assembled. A few were standard issue M14 rifles with production serial numbers such as 55632, and 87156 and 1545579. Most of the rifles had hand stamped experimental or test model numbers, e.g., X-40. A number of these M14 rifles were assembled with T44E6 parts and some had the rear sight pocket knob holes milled off while others lacked the U S RIFLE M14 marking on the heel. The Harrington & Richardson M14 rifles that required it were heat treated at FPM Heat Treating (Chicago, IL). This collection of Harrington & Richardson M14 rifles was then phosphate coated and assembled into new M14 rifles with standard USGI M14 parts. Parts were cannibalized from the four .22 LR caliber select fire rifles to create three complete .22 LR caliber M14 Simulator models. The phosphate coating and rebuilding of the Harrington & Richardson rifles was done under the supervision of Robert J. Perry and an associate who wishes to remain anonymous.

U. S. Department of Energy - The U. S. Department of Energy (DOE) purchased twenty-five Springfield Armory, Inc. M21 models in the late 1990s for its Special Response Force. The commercial M21 rifles performed well. The DOE subsequently purchased USGI M14 rifles from Anniston Army Depot. At one point, the DOE inventory of M14 rifles was about 300. The M14 rifles were stored in three different locations. Scoped DOE M14 rifles were fitted with Smith Enterprise, Inc. Weaver style rail XM-21 scope mounts.

As of 2007, most of the M14 rifles at DOE have been transferred to other government agencies and the few remaining are not issue equipment. All remaining M14 rifles held by DOE were to be eventually transferred to other government agencies. DOE disposal procedures only allow transfer to another government agency or destruction. Those are the only allowable means of reducing weapons inventory for DOE. It remains a mystery as to how but a small number of the USGI M14 rifles formerly held by the DOE were released for sale in the late 1990s to the public. This small lot of USGI M14 rifles was obtained and subsequently sold into the commercial market by Class 3 SOT/FFL businessman F. Charles Logan (Warrendale, PA).

The number of former DOE M14 rifles released for sale has been reported as fifteen by a very credible source. Many of these DOE M14 rifles have the symbol # and a number etched on the left side of the receiver above the stock line. These are DOE weapons chit numbers. The numbers were engraved on the receivers at the direction of the DOE Senior Firearms Advisor at the time, Dave Shannon. A second very credible source has observed one DOE M14 rifle etched with # 29. Another six of these DOE M14 rifles are etched with the following: # 8, # 10, # 19, # 21 (H & R serial number 1564367), # 22 (H & R serial number 1566863) and # 34 (Winchester serial number 1117145).

NFA Registered Welded Select Fire Models - The following FFL/SOT businesses legally welded pieces of scrap to create USGI M14 receivers and registered them in time to remain transferable: Bill Fleming (Collinsville, OK), H&R Gun Co. (Holland, OH), John Norrell Arms, Inc. (Little Rock, AR), Neal Smith (Smith Firearms in Mentor, OH), Specialty Arms Co. (Springfield, OH) and the late Bruce Swalwell (Metro Tech, Ltd. of McHenry, IL).

One M14 receiver legally welded together by Bruce Swalwell was engraved M Tech McHenry ILL. Mr. Swalwell also worked for Neal Smith before 1986. Reportedly, Bill Fleming registered about fifty welded USGI select fire M14 receivers. H&R Gun Co. M14 type rifle serial number 0556 is a select fire USGI M14 receiver rifle. It was originally registered with the BATF by an approved NFA Form before the May 1986 ban. On March 31, 2003 this rifle sported a USGI birch stock, USGI M2 bipod, 18 " barrel and lugless flash suppressor. It was quickly sold by Elite Firearms (Boaz, KY).

Post-’86 dealer samples - A small number of Chinese Norinco select fire M14 rifles were imported about 1991 into the United States by Century Arms International as post-'86 dealer samples for sale to law enforcement agencies. Serial numbers for some of these NFA registered post-'86 ban dealer sample Norinco select fire M14 rifles are 62021815, 62044810, 63015693, 63022377, and 63035184.

In the late 1980s, Global Sales (then Minden, NV) imported USGI M14 rifles from Israel into the United States legally for sale to law enforcement agencies. Dennys Guns (North Kansas City, MO) imported Harrington & Richardson Arms Co. M14 serial number 9970X as a post-'86 dealer sample.

**Ignore the Petition to Sell the M14!**

Ignore any petition regarding public sales of M14 rifles. Orest Michaels, Chief Operating Officer for the U. S. Civilian Marksmanship Program (CMP), stated in a June 17, 2003 e-mail message to a member of the Internet discussion board www.battlerifles.com: that 1) the U. S. Army has no surplus M14 rifles to sell 2) no M14 rifles are being destroyed and none have been destroyed for almost ten years 3) CMP may not want to or may not be allowed to get involved if such a program existed anyway because the M14 is considered a machine gun. A petition to this effect occasionally surfaces in various e-mail messages and Internet discussion groups, but is filled with outdated information.

The 1996 Fiscal Year National Defense Authorization Act changed the legal status of the Civilian Marksmanship Program and the Office of Director of Civilian Marksmanship. On October 01, 1996, these entities were given non-profit corporate status by statute, and ceased to be a part of the U. S. government. Until then, the CMP was a part of the U. S. Department of the Army.

**Select Fire M14 Rifle Rate of Fire Modification**

John C. Garand designed a rate reducer for the T20E2 rifle between 1948 and 1950. He modified the T20E2 rate reducer in 1953 for the T44E1 rifle. The T44E1 rate reducer slowed the automatic rate of fire from 735 rpm to 550 rpm. This device was contained inside the trigger housing. It acted to slow the speed of the hammer. An electronic rate of fire controller made by the Pinderton Company was used on the T20E2 and T44 rifles in 1951. David C. Fletcher, believed to be an employee of Springfield Armory, developed a rate reducer for the M1 Garand rifle in 1953. The Fletcher device allowed the rate of fire to be increased or decreased to a degree by adjusting the tension of its coil spring. A rate reducer for the M15 rifle was also tested but eliminated. Tests showed comparable accuracy at both rates of fire in automatic.

During the Viet Nam War, American soldiers experimented with different means of changing the rate of fire of a M14 rifle in automatic. Soldiers in Viet Nam developed modifications which could make the M14 fire at either rate of 550 or 1100 rounds per minute. By milling a 0.060 " wide and deep channel along the top of the cylindrical portion of the gas piston the rate of fire was slowed to 550 rounds per minute. The rate of fire in a select fire M14 can be reduced 40 to 50 rounds per minute by drilling a hole in the center of the gas cylinder. The drill bit size used for this is 0.0400 ". With use, the hole will enlarge due to gas erosion.

Springfield Armory, Inc. M1A serial number 030061 was tested in January 2008 for rate of fire using a P. A. C. T. Mark IV chronograph. The M1A was fitted with a 22 " TRW chromium plated barrel, Smith Enterprise, Inc. flash hider, gas cylinder and chromium plated gas piston, a Sadlak Industries, LLC National Match operating rod spring guide and a CS Speedlock chromium silicon alloy steel operating rod spring. It averaged 798 rounds per minute using 1979 vintage Portuguese surplus ammunition. Using the modified gas cylinder plug mentioned above, the rate of fire averaged 754 rounds per minute with the same lot of ammunition.

**Military versus Civilian Use**

Human behavior and the laws of nature are constant but technology allows greater opportunity for both good and evil. Every weapon has its physical and historical limitations. What was state-of-the-art becomes obsolete as newer means of delivering incapacitating energy are invented and refined. The historical relevance or military life span for a given weapon or weapon type may be a few short years or several centuries. The M14 may be the top pick in the "Comeback Kid" category in the Age of Smokeless Gunpowder. Despite a general lack of military support for this weapon system, military and civilian demand keeps it very much in use simply because it works well.

First Sergeant Orian E. Melter, U. S. Marine Corps, served from 1959 to 1980 including two tours in the Republic of Viet Nam. On his first tour in 1966, he carried a M14 rifle as the radioman in a rifle platoon of 2nd Battalion 4th Marines while conducting combat operations in Quang Tri. While assigned to the Marine Corps Recruit Depot (San Diego, CA) in 1971, he stated, "The military is a reflection of the society from which it comes."

The American nation underwent a cultural revolution in the 1960s. The U. S. military was similarly transformed in many ways during this period, including how it developed and procured small arms. The principal change agent within the Department of Defense was Robert Strange McNamara. Mr. McNamara was Secretary of Defense from January 1961 to February 1968. As a result of decisions he took, the traditional system of government arsenals, armories and depots was emasculated in favor of a private sector system of competition and contracts for development and manufacture of military small arms. It is beyond the scope of this work to cover that history but both systems have their own set of advantages and disadvantages.

One of many changes within the U. S. Department of Defense in the mid-1960s was the almost total abandonment of the M14 rifle. Secretary McNamara and combat experience in the Republic of Viet Nam favored the high velocity small caliber 5.56 mm NATO cartridge and the M16 rifle. This was in contrast to the 7.62 mm NATO cartridge and the M14 rifle backed by the U. S. Army Ordnance Corps and Infantry Board. However, the impetus was an honest evaluation of small infantry unit tactics from World War II and Korea. It was found that the infantry rifle fire was effective to less than 200 yards on average early in the Korean War. At the same time, the M1918 and M1919 type automatic weapons were effective out to 400 yards. Consequently, small infantry unit tactics doctrine changed and the need for automatic fire organic to the infantry rifle squad was established. As a result, each infantry squad was assigned a second M1918 Browning Automatic Rifle late in the Korean War.

By 1958, development of high velocity small caliber rifles and cartridges began the institutional struggle within the U. S. Army to change from a .30 caliber cartridge to a .22 caliber round. The turning point in the debate came with publication of the Hatch Report in 1962. Essentially, the argument turned on three points: 1) rifle and ammunition weight savings with a small caliber cartridge 2) a greater number of hits per pound of ammunition with the high velocity small caliber cartridge and 3) most combat engagements occur at less than 300 yards negating the need for a full size rifle cartridge. In a sentence, it was the .223 Remington bullet that changed everything for the M14 rifle. With the change in ammunition came a new delivery system, the M16 rifle and later variants.

Fortunately, the M14 was rescued from near death in the late 1960s and early 1970s. It was the competition match shooter community that created the demand for a commercial M14 rifle. By 1971, civilians could purchase a semi-automatic version of what had been a government monopoly. Sales of M14 spare parts from the U. S. government and its contractors supplied the civilian market with an affordable supply of parts with which to build new commercial manufacture M14 type rifles. Military and civilian competition shooters upholding the American tradition of marksmanship continued to keep the M14 very much alive through the 1970s, 1980s and into the early 1990s. Due to a second wave of gun control laws in the late 1980s and early 1990s, civilian interest in and demand for the M14 blossomed henceforth. Product development by private industry in the present day continues to fuel both commercial and military interest in the M14 platform.

More than fifty years after the M14 Rifle was adopted by the U. S. Department of Army as its standard infantry weapon, the U. S. government retains less than 10 % of the original inventory, none of the spare parts, no ability to manufacture new parts, and very little of the necessary maintenance support. Some of the remaining M14 rifles have been unwrapped and pressed into service in the Global War on Terrorism in the role of designated marksman rifle for U. S. Army and Army National Guard units. At the same time, the United States civilian population possesses approximately three times the number of M14 type rifles as the U. S. government as well as possessing all of the available spare parts, all of the capacity to produce new parts, most of the maintenance support, and acts as custodian of the associated knowledge base.

Critics of the M14 rifle argue that its long range reach is unnecessary. Well-documented research and testing stemming from World War II onward has concluded that 300 yards is the maximum range for most combat situations involving individual rifle fire. Additionally, the weight and length of the M14 make it cumbersome for military users according to the naysayers. However, newer designs for stocks, barrels and muzzle attachments make the M14 competitive in weight and length with modern high velocity small caliber rifles and carbines. While long range fire is not the typical norm for individual riflemen in modern combat, the greater energy delivered from the 7.62 mm NATO projectile is a reassuring capability at the squad level.

Neither technology or economics will trump the laws of nature. Neither full power cartridge or high velocity small caliber cartridge can meet all needs for the infantryman. The infantry unit equipped with an appropriate mix of rifles chambered for both schools of thought will fare better than one outfitted with just one size cartridge. For the military end user, the M14 is one of several tools available to the small unit leader. For the civilian, it may be the only viable choice in time of danger. Military operators and civilian firearms owners appreciate the M14 rifle for its reliability, accuracy, and punch. The platform has proven to be fairly adaptable to a number of military and civilian roles. When all is said and done, the M14 serves its purpose faithfully.

The civilian M14 rifle enthusiast has four strong factors in his favor: 1) a properly machined and heat treated M14 type receiver will last for hundreds of thousands of rounds 2) certain regulations aside, M14 parts other than the receiver are not highly regulated 3) within the United States, copies of the U. S. government drawings for M14 parts are available and 4) many machine shops and heat treaters still welcome business opportunities. For civilians without benefit of artillery, armor or close air support, the M14 rifle is an excellent choice for defense of home and community. The future of the M14 rifle looks clear and bright. Parts 2 and 3 of this work attempt to describe that panorama.

**Part 1 Notes**

1. Culver Shooting Page Lane's Tips www.jouster.com/lanestips Gus Fisher's FAQ discussion of USGI M14 receivers and parts. Gus Fisher, a former, USMC shooting team armorer for two years, stated he was told by a very trustworthy source that TRW receivers were good for 450,000 rounds whereas the other USGI receivers lasted about 400,000 rounds.
2. Photobetty. “Before You – Dickey Chapelle.”

# Part 2

# The Commercial M14

### U. S. Commercial Production of the M14 Type Rifle

Commercial production of the M14 type rifle began by 1971 and continues to the present day. The following tables are not a complete accounting of serial numbers but based on observation of serial numbers, U. S. commercial manufacturers have produced well over 270,000 M14 type receivers. Note that some manufacturers (Armscorp of America, Maunz Match Rifle, Smith Enterprise, Inc., and Springfield Armory, Inc.) have issued custom serial numbers to receivers. Custom serial numbers are not accounted for in this table.

**Table 13: Production of Commercial M14 Rifles**

| U. S. Company Name on the Finished Receiver | Receiver Model Marking | Highest Known Serial Number and Comments |
|---|---|---|
| A. R. Sales Co. (South El Monte, CA) | Mark IV | 225 receivers (200 in the serial number range 1 to 225 and 25 in the range 226 to 250) |
| Armscorp of America, Inc., Armscorp USA, Inc. JRM / Armscorp (Silver Spring and Baltimore, MD) | M14, M14 NM, M21, XM25 | 17677 (some serial numbers preceded by A) + 20 (S prefix serial number) + 13 (WTA prefix and four digit serial number) + 111 receivers (TFL prefix followed by serial number 001 to 081 + 30 receivers between 083 and 250) |
| Entreprise Arms, Inc. (Irwindale, CA) | M14A2 | 1119 (serial numbers preceded by E, EA or ABNI) |
| Federal Ordnance, Inc. (El Monte, CA) | CM14SA, CSA14, M14, M14A, M14SA, | 60308 + 1301 (C series prefix serial numbers made for Century Arms International) + 10 (VCE series) |
| Fulton Armory (Savage, MD) | M14, M14 NM, M21, XM25 | 702 (serial numbers began at FA00000) + 50 (WR serial numbers start at 000) |
| Hesse, Ltd. (St. Paul, MN) | M14H | 365 |
| H&R Gun Co. (Smith Manufacturing Co.) (Holland, OH) | Semi-Auto 7.62MM-M14 | 1128 |

| | | |
|---|---|---|
| LRB Arms (LRB of Long Island, Inc.) (Bellerose and Floral Park, NY) | M14SA, M25 | 71 receivers (M14SA serial numbers less than 01201) + 2450 (M14SA serial numbers 01201 and higher) + 10312 (M25 serial numbers 10001 and higher) + 99 (TFL series) |
| Maunz Match Rifle (Smith Manufacturing Co.) (Holland, OH) | MODEL 77, MODEL 87 | 5040 (MODEL 77 serial numbers are four digits) + 3030 (MODEL 87 serial numbers) + 50 (ASU serial numbers are five digits starting at 00010) |
| Maunz Manufacturing, Inc. (Toledo, OH) | U. S. RIFLE | 1011 (four digit serial numbers) + 10 (EX series have one or two digit serial numbers) |
| National Ordnance, Inc. (South El Monte, CA) | ? | 2 |
| Sarco, Inc. (Stirling, NJ) | M21 | 2 |
| Smith Enterprise, Inc. (Mesa and Tempe, AZ) | M-14, M-14 NM, M-21 | more than 176 (select fire pre-'86 FA series) + 2,600 (pre-'94 ban) + 80 to 85 (post-'94 ban serial numbers starting at 5000) + 1 (M-21) |
| Smith Ltd. (Smith Manufacturing Co.) (Holland, OH) | M-14 | 237 (serial numbers are four digits) + 5 (EX series have one digit serial numbers) |
| Springfield Armory, Inc. (San Antonio and Devine, TX) (Geneseo, IL) | M1A, M1-A, M-1A, M15 | 230112 (serial numbers are six digits) + 200 (SM series) + 227 (IDF series) + 556 (WF series) + 500 (VME series) + 68 (X series) + 1 (M15) + AR series + MC series |

A batch of investment cast AISI 8620 alloy steel semi-automatic receivers were made between 1972 and 1975. Some of these receivers were not completely machined or heat treated. These receivers were marked as follows on the receiver heel M W G ASSAULT-1 BARBERTON OH. The serial number is located on the left side of the receiver at the rear or on the right side on the vertical surface of the operating rod rail. The letters M W G were cast into the receiver on the flat surface just behind the rear sight. The highest observed serial number for the M W G receivers is 000389. If a M14 type receiver has not been heat treated, it should not be used to build a rifle.

**Characteristics of Commercial Receivers**

Cast receivers - A. R. Sales Co., some Armscorp of America, Armscorp USA, JRM / Armscorp, Federal Ordnance, Hesse, Ltd., H&R Gun Co., Maunz Match Rifle, Maunz Mfg., most Smith Enterprise, Smith Ltd. and Springfield Armory, Inc. receivers are made by the investment casting method. Investment casting has existed in China for centuries. However, it did not gain industrial significance until after World War II with the demand for aircraft and aerospace parts. Investment casting allows complex shapes and thin sections to be formed with very close dimensional tolerances. It is common practice for the rifle manufacturer to design and own the casting die for the receiver. Any repairs or modifications to the receiver die are normally the responsibility of the owner.

Billet machined and forged receivers - Entreprise Arms and some Armscorp of America and Smith Enterprise receivers are machined from raw billet. Chinese and LRB Arms receivers are drop forged. The rifle manufacturer, typically, owns the receiver forging dies and is responsible for any maintenance on the dies.

Receiver Barrel Ring - Chinese, LRB Arms, Fulton Armory and some Springfield Armory, Inc. receivers have a distinct machined flat surface with a longitudinal edge on the top of the barrel ring. At some point after the first 3000 Springfield Armory, Inc. M1A receivers, the presence of this flat surface on the top of the barrel ring is found sporadically until a serial number just above 030000. The flat surface on the barrel ring is present on serial numbers 0062XX, 00623X, 00724X and 01899X but is not on 015XXX, 020XXX, 0210XX and 0301XX.

Caliber Marking - Springfield Armory, Inc. used upper case letters MM as part of the 7.62-MM caliber receiver marking until at least serial number 000326. At some point between serial numbers 000377 and 000440, Springfield Armory, Inc. changed the abbreviation for millimeter to lower case mm on its receivers. Springfield Armory, Inc. used to include the stamping 7.62-mm or 7.62mm as part of the receiver marking. The 7.62-mm marking is the more common of the two. Additionally, where the caliber is indicated as 7.62mm (no hyphen) the model number is stamped as M-1A (with hyphen) instead of the usual M1A model number. Receiver serial numbers are 0616XX, 062110 and 66857 are stamped with 7.62mm (no hyphen) and M-1A (with hyphen).

The 7.62 millimeter caliber markings began with serial number 000001 and remained as part of the heel stamping until at least serial number 0630XX. By serial number 063112 the caliber marking no longer appears on M1A receivers. Thus, about March 1991 the 7.62-mm and 7.62mm markings were dropped because Springfield Armory, Inc. was producing the M1A in different calibers, e.g., 7mm-08.

Millimeter is stamped with an upper case MM on Armscorp of America, Armscorp USA, JRM / Armscorp, Entreprise Arms, Fulton Armory, LRB Arms, Smith Ltd., Smith Enterprise, and some imported Poly Technologies receivers. On most Chinese M14 type rifles imported into the United States the caliber is typically denoted .308 but will be indicated on the barrel if not on the receiver. A Poly Technologies M14/S rifle, serial number 0653, has been observed with the receiver heel caliber stamping 7.62 NATO.

Receiver Scope Mount Horizontal Groove and Bolt Hole - Some commercial receivers have horizontal grooves too shallow and narrow to accommodate military specification side three point scope mounts, e.g., Brookfield Precision Tool and Sadlak Industries. The USGI drawing specification for the horizontal groove is 0.149 " wide at the top of the groove with a sixty degree angle from the bottom of the groove. Commercial receiver horizontal grooves can measure as narrow as 0.120 " at the top of the groove. Early production Smith Enterprise, Inc. receiver scope mount bolt holes were made with a pitch of twenty-four threads per inch. This is the only known exception for M14 type receivers which otherwise accept a Number 12 - 32 NEF thread screw.

**Commercial Receiver Geometry**

Presently, only LRB of Long Island, Inc. and Springfield Armory, Inc. are producing M14 type receivers in the United States. The commercial semi-automatic M14 type receivers have no selector lug, no operating rod rail center dismount notch, and no groove on the front underside of the operating rod rail. The dismount notch for the operating rod is located at the rear end of the operating rod rail on all U. S. commercial and post-1978 Chinese receivers. Some commercial receivers have a very slight ledge between the operating rod channel vertical surface and the operating rod dismount notch, e.g., Springfield Armory, Inc. and Armscorp USA. This ledge helps to secure the operating rod to the receiver but it increases the patience and care necessary for field stripping.

Bolt Lock Window - A very few commercial receivers were machined with the bottom of the bolt lock window too high. This may cause the bolt lock to bind against the bolt left rear lug making the bolt stick. Some commercial receivers had bolt lock windows with too much radius in the corners which restricted bolt lock engagement. Very rarely, commercial receivers will have burrs in the bolt lock window corners that require minor filing to clean them up. Some receivers from one particular manufacturer have a rounded bolt lock window lower front corner. This can result in unexpected bolt lock release. It can often be corrected by carefully squaring the bolt lock window front corner. Some commercial manufacturers have made the bolt lock windows slightly large in an attempt to eliminate bolt lock problems. The bolt lock window is a difficult area to machine and all commercial manufacturers have experienced problems in this area. Often, simple adjustments by a M14 gunsmith are all that is required to correct any bolt lock issues.

Operating Rod Rail - Springfield Armory, Inc. and Smith Enterprise, Inc. select fire receivers have both the rear and center operating rod dismount notches as well as the cut on the under side of the forward end of the operating rod rail. If a receiver is USGI or 1965 Chinese manufacture, it will not have the operating rod rear dismount notch.

Many of the U. S. commercial receivers (Springfield Armory, Inc., Armscorp USA, Fulton Armory, etc.) have operating rod rails wider than the USGI specification. Operating rod rail width has been measured on Armscorp receivers as follows: 1) serial number 10451 manufactured in April 1993 – 0.232 " 2) serial number 15906 manufactured in January 2000 – 0.258 " 3) serial numbers 17011 and 17013 both manufactured in July 2003 – 0.316 ". The Armscorp USA receiver operating rod rail was also machined differently from USGI specification to prevent the bolt roller from slamming back. Armscorp USA receiver operating rod rail channels were deliberately undersized to accept operating rods with worn tabs, because new USGI operating rods ones are scarce.

The Fulton Armory receiver operating rod rail measures about 0.140 " wider than the USGI receiver operating rod rail specification (0.130 " – 0.01 "). Canadian import Norinco receiver operating rod rails are approximately 2 mm wider than the USGI drawing specification. The select fire Springfield Armory, Inc. receiver operating rod rail is 1/8 " wide while its semi-automatic receivers are made with one 3/16 " or 13/64 " wide. Melvin A. Smith increased the M1A operating rod rail width by 0.066 " to achieve the same strength as the USGI M14 receiver. Additionally, the wider operating rod rail provides more bedding surface and complicates conversion to select fire.

Semi-automatic M14 type receivers will not have the selector lug and operating rod rail machining cuts. Springfield Armory, Inc. M25, LRB Arms M25 and some Norinco M305 receivers do not have the scope mount boss on the left side. Armscorp of America, Armscorp USA, LRB Arms, Smith Enterprise, Springfield Armory, Inc. and Entreprise Arms also made rear lugged and double lugged receivers for competition shooting. The receiver lug or lugs are welded on to the receiver. Fulton Armory offered rear lugged receivers until 2007. Springfield Armory, Inc. has offered a rear lugged receiver since 1989 and LRB Arms has done so since 2003. Smith Enterprise has added lugs to receivers upon customer request since at least 1991. Receiver lugs are welded on with two known exceptions. About 1985 or 1986, Smith Manufacturing Co. (Holland, OH) produced rear lugged receivers from castings for Armscorp of America. Karl Maunz designed and marketed a bolted receiver front lug from 1985 to 1987.

Some late manufacture Federal Ordnance and other commercial receivers have a screw threaded into a small hole in the center of the rear sight pocket. This aftermarket modification was done to accept a Lyman Products target sight mounting block.

Manufacturing Difficulty and Forgiveness – Even though the M14 receiver is essentially an updated 1936 design, it is not easily machined into final form. The USGI M14 receiver has an overall nominal length of 7.92 " and an overall nominal width of 2.04 ". It weighs approximately 1 pound 4 ounces. Aside from the M1 Rifle receiver, it is likely the most intricately machined firearms receiver to ever be made.

Springfield Armory, Inc. M1A receivers under serial number 003700 have shown some deficiencies. These deficiencies illustrate both the difficulty of making the receiver and the general ease of repairing same.

1) The receiver bridge primary (bolt closing) firing pin retracting surface can be mislocated. The firing pin itself should be examined on a regular basis. The camming surface of the tang may show damage. If the firing pin is damaged, it should be replaced. Also, the first or second version firing pin should be used in these receivers. Without the chromium plating of the third version, most of the damage will be on the firing pin instead of the receiver bridge. The harder chromium plated surface of the third version firing pin will cut a groove into the receiver bridge deeper and sooner. Note that light polish wear is normal on the retracting surface but a groove cut by the firing pin is not.

2) The receiver rear sight elevation knob indexing detents wear prematurely due to slightly too soft surface hardness. The simple fix is to install an elevation repair disk between the elevation knob and the receiver rear sight pocket left side ear.

3) The bottom of the bolt roller makes contact with the receiver when the bolt is in battery. This is a simple fix for a reputable M14 gunsmith. The fix will save replacing the bolt or bolt roller. It also provides complete bolt-to-receiver lock up.

4) The receiver locking lug engagement surface is slightly misaligned. A reputable M14 gunsmith can lap the bolt to solve this issue. This is a must for competition shooting and it evenly distributes the stress on the receiver.

5) The rear sight pocket is slightly too short. This results in a slight over hang of the base at the rear by about 0.020 ". This springs the rear sight cover more than it should. The front edge of the cover can be lightly filed down. That allows less force needed to install the rear sight cover and thereby secure the rear sight aperture.

6) The holes for the bolt lock pin are too small. The bolt lock roll pins could be forced in which may cause one of the bolt lock window receptors to break. The simple solution is to use a slightly smaller diameter pin.

Modeling the receiver with Computer Aid Design software is extremely challenging for the advanced design engineer. As of 2008, a five axis CNC machining center was still not capable of performing all of the cuts necessary to bring the receiver to final form, e.g., LRB Arms M14SA and M25 receivers. Some cuts still require manual manipulation of a cutting tool to complete the form to blueprint specification. The drawings require numerous helical cuts. The left bolt lug camming surface just aft of the barrel ring is the most difficult helical cut to make on the M14 receiver. However, it is a very forgiving design in that many of the machining cuts are purely cosmetic. For example, the top edge contour from the rear sight pocket to the barrel ring, the relief cut above the bolt lock, the barrel ring top center and left hand corner, and the heel corner symmetry on commercial receivers are often not identical to USGI receivers but accuracy and function are not affected in the least.

Comparison of USGI and Springfield Armory, Inc. Select Fire Receivers - There are six minor differences between the commercial Springfield Armory, Inc. select fire receiver and a USGI receiver: 1) the commercial receiver has a rear dismount notch 2) receiver heel stampings reflect either USGI contractor or the commercial Springfield Armory, Inc. manufacture 3) the USGI receiver has the part number, 7790189, stamped underneath the operating rod rail forward of the center dismount notch 4) the USGI receiver has a hole drilled in the right receiver leg 5) the commercial receiver selector lug is neatly welded on and 6) Springfield Armory, Inc. receivers have a small hemisphere machined on the outboard side of the receiver rear sight pocket right ear. Otherwise, they look the same. An examination of both select fire receivers under the heel, rear sight base and cartridge clip guide show similar underside machining cuts.

**U. S. Commercial Manufacture Select Fire M14 Type Rifles**

Civilians may own select fire M14 type rifles in the United States of America as long as federal, state and local laws are complied with. However, the May 19, 1986 McClure-Volkmer Firearms Owners Protection Act banned new production of select fire M14 type rifles allowed for civilian possession under the registration provisions of the 1934 National Firearms Act. Converted and new commercial manufacture receivers were registered under the National Firearms Act by approved ATF Form before May 19, 1986.

Since 1971, U. S. commercial manufacturers have produced more than 270,000 M14 type receivers but less than one percent of them are select fire capable. Springfield Armory, Inc. (Geneseo, IL) produced 125 select fire M1A rifles between the late 1970s and May 1986 at its factory. Some serial numbers observed for original factory built Springfield Armory, Inc. National Firearms Act registered select fire M1A rifles are 030061, 033905, 038215, 038503, 038607, 038767 and 038770. A few more than 176 Smith Enterprise select fire M-14 rifles were produced before May 19, 1986.

A number of Springfield Armory, Inc. M1A rifles made by the Texas company have been identified as NFA registered select fire conversion models such as serial numbers 000908, 001691 and 002860. As early as May 1974, Class 2 FFL/SOT Fred L. Rexer, Jr. (Houston, TX) was converting M1A rifles to select fire capability. He offered his conversions in a standard M14 wood stock for $365.00 or dressed in a M14E2 stock for $415.00. The Rexer conversions are denoted by the letters FAKTS on the left side of the receiver. M1A serial number 001691 is one of the FAKTS conversions. At least one Texas M1A was converted by Federal Firearms Licensee Stan Andrewski. In early 1975, Class 2 FFL/SOT Rich Davis (Salem, VA) sold select fire conversions of the Springfield Armory, Inc. M1A for $550.00.

A number of Illinois M1A rifles were converted to select fire after they left the factory and registered under the National Firearms Act. Rock Island Armory (Colona, IL), the late J. D. Farmer of Hard Times Armory (GA), R.P.B. Industries (Avondale Estates, GA), and Federal Firearms Licensees Earl Banta (TX), Charles Erb, Martin Pearl (NM) and Neal

Smith (OH) were businesses who legally performed such work. For example, Hard Times Armory was the manufacturer who converted M1A serial number 014748 to select fire. Neal Smith conversions were marked on the receiver under the stock line: top line - NEAL B. SMITH, JR. bottom line - MENTOR, OHIO. Pearl Manufacturing (Grants, NM) legally converted at least one Springfield Armory, Inc. M1A to select fire and registered it with the BATF NFA Branch. Rock Island Armory converted thirty-five M1A rifles to select fire capability before May 1986.

**Camp Perry Military Reservation**

Camp Perry Military Reservation is a 640 acre Ohio National Guard marksmanship training center. It is the largest small arms firing range in the world. Camp Perry is located on the shore of Lake Erie about eighty miles west of Cleveland, OH. Since 1907, military and civilian shooters have participated in the National Rifle Association and National Board for the Promotion of Rifle Practice / Civilian Marksmanship Program (CMP) national matches conducted each summer. Collectively, these are known as the "National Matches." The M14 M and M14 NM were first shot at Camp Perry at the 1963 National Rifle Matches. The M14 NM was first used in competition at Camp Perry during the National Matches held August 16 to August 30, 1964. The M16 and its civilian semi-automatic only versions were approved for matches in 1971 by the National Board for the Promotion of Rifle Practice. By the early 1990s, the M16 style rifle had essentially replaced the M14 for match competition at Camp Perry. 1994 was the last year for the U. S. Army shooting team to field the M14 at the National Matches. However, the U. S. Marine Corps held on the longest using the M14 NM as late as 1996 at the National Matches. The Marines experimented with various length gas pistons along with other techniques in a systematic quest to maximize the accuracy of the M14 rifle.

John C. Garand retired in April 1953 from Springfield Armory. He did some consulting work for Mathewson Tool Company in 1954 on the T44E4 rifle, developmental version of the M14. He visited the National Matches at Camp Perry every summer with 1961 being his last trip there. As part of his last visit to Camp Perry, Mr. Garand visited the TRW test facilities at the adjacent Erie Ordnance Depot while developmental work was being done on the M14 NM. TRW occupied four brick buildings at the Erie Ordnance Depot. The U. S. Coast Guard had office spaces in one of these buildings in February 2005. In the early 1960s, Erie Ordnance Depot warehoused hundreds of thousands of M1 Garand and M14 rifles.

As an aside, at the Camp Perry National Matches, TRW assembled and exhibited a display board 4 feet by 8 feet in size displaying all of the M14 rifle parts with many of them in various stages of manufacture. The raw forgings of the eleven TRW manufactured M14 parts were displayed on the board. This included a semi-finished receiver. The rear sight knob components were shown individually and in assembled condition. The display board also had two TRW M14 barrels of which one barrel had been cut in two places along the length to show the chamber and bore rifling. This TRW display board was sold at a Ohio gun show in March 1972.

From 1960 until at least 1968, men such as Elmer Ballance, Karl Maunz, and Richard Smith participated in the shooting competition at Camp Perry. Melvin A. Smith was at Camp Perry each year during this period selling welded M1 Garand receivers and parts to civilian competition shooters. From the early 1960s until 1974, civilian competitors used the M1 Garand rifle and military shooters were equipped with the M14 rifle. Before 1960 until some time in the mid-1970s as many as 3,500 civilians competing at Camp Perry each summer were housed in hundreds of four man wood huts. The wood huts had originally been built to house Prisoners-of-War during World War II. In the 1960s, they were labeled with automobile license plates to assist the residents in locating their assigned huts. Most of these wood huts were torn down a long time ago but a few dozen were still intact in February 2005. These wood huts were approximately 16 feet square. In the 1960s, each hut had four single military bunk beds and a wall-mounted rifle rack for the occupants to store their rifles.

From about 1970 until 1986, civilian competitors traded M14 rifle parts amongst themselves from these wood huts and from their automobiles. This practice was known as "tailgating." Karl Maunz started an informal association of competition shooters in 1984 in Atlanta, GA known as the American Shooters Union. The American Shooters Union had set up a place to buy, sell, and trade M14 parts in 1985 amongst the Commercial Row at Camp Perry. Camp Perry officials put a halt to tailgating as of 1986. In response, Karl Maunz and other members of the American Shooters Union opened a firearm parts and accessories store known as Uncle Sam's. The store was located at 4484 W. Lakeshore Port Clinton, OH, directly across the highway from the entrance to Camp Perry. In the summer of 1986, Uncle Sam's sold used M14 parts and other firearms related items. From their 1986 catalog, some of the M14 parts prices are as follows: complete bolt $35.00, stripped bolt $25.00, barrel $75.00, flash suppressor $15.00, gas cylinder $15.00, operating rod $30.00, fiberglass stock $10.00, complete rear sight assembly $15.00, complete USGI M14 parts kit $239.95, Accuracy Lug $39.95, and Maunz Mfg. receivers for $239.95.

In observance of the100th Anniversary of the National Matches at Camp Perry, Springfield Armory, Inc. sponsored the NRA / Springfield Armory M1A Match. The match consisted of fifty shots at 300 yards. It was held August 05, 2007 at Camp Perry with more than 500 shooters participating. The firm donated $25,000.00 in cash, merchandise awards, and medallions to those shooters taking part. The weather for the match was less than ideal. Heavy rain turned the firing line into mud in short order. At the end, seventeen year old Ryan Castonguay (New Hartford, CT) was the match champion with a score of 463-8X.

**Civilian and Military Marksmanship Awards**

Civilians in the competition shooting community provided the impetus for a commercial version of the M14 rifle. Thus, it may benefit the reader at this point to an explanation of how competitive High Power rifle shooters are classified and why there was a market for such a rifle. The National Rifle Association (NRA) awards marksmanship classifications according to scores achieved in NRA approved or registered shooting matches. The NRA classification is based upon the percentage of possible points achieved in NRA recognized matches.

The NRA awards an initial classification to a competitive shooter after 120 recorded shots (three recognized matches). Each shot is worth a maximum of 10 points. Thus, a fifty round match is worth up to 500 points. The shooter is reclassified by the NRA every 240 shots thereafter. The classification award for the shooter is based on his average score. To qualify for a particular classification, the shooter must have fired a given average score as listed below within that class.

The highest NRA classification is High Master. High Master is awarded to a competitor who averages a score of 97 % or better for 300 shots in NRA approved or registered matches. The other NRA classifications are Master at 94 %, Expert at 89 %, Sharp Shooter at 84 % and Marksman for less than 84 %. Shooters of the same classification compete amongst each other.

High Power Rifle Matches are typically divided into Service Rifle and Match Rifle categories. Service Rifles must keep the same external appearance of the military service rifles, e.g., M1 Garand, M14 and M16. This rule allows commercial versions of the military service rifles to be used in NRA High Power matches. The competition Service Rifle must also use the same caliber of ammunition as the associated military service rifles. Match rifles do not have the same restrictions as Service Rifles so they are usually customized to the individual shooter.

The Distinguished Rifleman or Distinguished Marksman badge is awarded to Service Rifle competitors. It is presented by the Civilian Marksmanship Program or the recipient's branch of the U. S. Armed Forces. The qualifying meets are known as Excellence-in-Competition (EIC) matches.

EIC matches are held at intraservice and interservice military matches, the annual National Matches at Camp Perry and at civilian State Championship or Regional Match competitions around the country. Competitors are limited to no more than four EIC matches each year but one of the four must be the National Trophy Individual Match at the National Matches held at Camp Perry. These EIC matches are commonly referred to as "Leg" matches. EIC matches are shot with Service Rifles only. The EIC matches use the full distance fifty shot National Match course. No sighting shots are allowed. The top ten percent of non-distinguished shooters earn six, eight or ten points credit toward the distinguished shooter badge.

If a shooter accumulates thirty points over the course of his lifetime, including at least one eight or ten point award, the distinguished shooter badge is awarded. The Navy, Marine Corps and Coast Guard award the Distinguished Marksman for Service Rifle competition. The Army, Air Force and the Civilian Marksmanship Program award the Distinguished Rifleman badge. The distinguished rifle badge was authorized by the U. S. Secretary of War in 1887.

The President's Hundred award was established in 1958 by the National Rifle Association. The President's Hundred shoulder tab is awarded to the top ten percent of civilian and military competitors, subject to the top 100 scorers, in the President's Match held at the National Matches. The President's Hundred cloth shoulder tab is approved for wear on enlisted military uniforms.

The U. S. Army and U. S. Marine Corps award weapons qualification badges as follows:

U. S. Army - A device signifying Expert, Sharpshooter or Marksman suspends a bar by two metal loops. The bar denotes the type of weapon the wearer qualified on, e.g., Rifle, Pistol, Machinegun, Carbine, Mortar, Artillery, etc.

U. S. Marine Corps - Badges are authorized for the most recent weapon qualification of Rifle Expert, Sharpshooter and Marksman and Pistol Expert, Sharpshooter and Marksman. The U. S. Marine Corps M14 Rifle qualification test consisted of the following: 1) ten rounds fired at 200 yards in slow fire in the standing position 2) ten rounds fired in sustained fire at 200 yards from the sitting position 3) ten rounds fired in slow fire at 300 yards with half shot from the sitting position and the other rounds fired in the kneeling position 4) ten rounds fired at 300 yards in sustained fire from the prone and 5) ten rounds at 500 yards in slow fire from the prone position. A total of fifty rounds were shot for a maximum possible 250 points. The minimum points necessary to earn U. S. Marine Corps rifle marksmanship badges were as follows: Rifle Marksman – 190, Rifle Sharpshooter – 210 and Rifle Expert – 225.

The U. S. Navy has issued the Rifle Marksmanship Ribbon and the Pistol Marksmanship Ribbons since 1920. The U. S. Navy Rifle Marksmanship Medal was first authorized in 1969. The U. S. Navy and U. S. Coast Guard award marksmanship medals and ribbons as follows:

U. S. Navy - 1) Navy Rifle (or Pistol) Marksmanship Medal and Ribbon for Expert (letter E device on medal and ribbon 2) Navy Rifle (or Pistol) Sharpshooter Ribbon (letter S device on ribbon) and 3) Navy Rifle (or Pistol) Marksman (plain ribbon).

U. S. Coast Guard - 1) Coast Guard Rifle (or Pistol) Marksmanship Medal and Ribbon for Expert (letter E device on medal and ribbon 2) Coast Guard Rifle (or Pistol) Sharpshooter

Ribbon (letter S device on ribbon) and 3) Coast Guard Rifle (or Pistol) Marksman Ribbon (plain ribbon).

The U. S. Air Force awards the Small Arms Expert Marksmanship Ribbon for a qualifying score in either rifle or pistol qualification. A bronze star on the ribbon denotes qualification in both rifle and pistol.

**Springfield Armory, Inc.**

Springfield Armory, Inc. is the oldest and largest commercial manufacturer of M14 type rifles. Springfield Armory, Inc. has been located in Geneseo, Illinois since November 1974 when Robert (Bob) R. Reese became the owner. While at Camp Perry in August 1973, Bob Reese took a photograph of Karl Maunz with a U. S. Marine utility cover (hat) on his head and a M1A rifle in his hands posing in the offhand position. Mr. Maunz borrowed the utility cover for the photograph from a friend present at the time. This photograph was drawn as an illustration and became the company's logo by no later than 1979. At the suggestion of Colonel Joe Smith, head of the DCM, in August 1973 at Camp Perry, Karl Maunz encouraged Mr. Reese to shoot the M1A rifle in a DCM match and he did so.

**Texas Production**

The Springfield Armory, Inc. story begins with U. S. Air Force veteran Mr. Elmer Ballance of Devine, Texas. His last name is correctly spelled with two lower case letters "L." He started his business, L. H. Gun Co., in 1960 while stationed at Lackland Air Force Base in San Antonio, Texas. The base had a housing subdivision named Lackland Heights. To save time writing, he named his company, L. H. Gun Co. "L. H." is an abbreviation for Lackland Heights. While serving in the Air Force, Mr. Ballance shot the M14 rifle in competition on the All Air Force High Power Team. Staff Sergeant Ballance earned U. S. Air Force Distinguished Rifleman Badge (# 42) before completing his military service in 1964. After that, he built match grade M1 Garand rifles for competition shooters. At some point, L. H. Gun Company also produced and sold .30 Caliber M1 Carbine ammunition in boxes of fifty cartridges.

The U. S. Army Springfield Armory had closed down in April 1968. During the NRA National Matches at Camp Perry in the summer of 1968, the closure of Springfield Armory was a topic of discussion among the attendees including Elmer Ballance, Karl Maunz and Melvin Smith. These three men and an unnamed fourth person, held two or three meetings during August 1968 in one of the wood huts used to house civilian competitors. During one of these meetings, there was a Buckeye beer case full of Melvin Smith welded M1 Garand receivers wrapped in newspaper in the middle of the hut. It was in this meeting that Karl Maunz voiced his suggestion to name the business venture that would produce commercial M14 type rifles, "Springfield." This was agreed to by the four men present.

Subsequent to this, Mr. Ballance began the process to acquire the name “Springfield Armory” for production of his commercial version of the M14 rifle. In late 1969, Mr. Ballance commenced work on making the dream of civilian M14 type rifles become reality. Though banks refused to fund his dream, this did not deter him. Mr. Ballance raised the funds himself. He and Melvin Smith of Valley Ordnance Co. worked together to get the equipment set up for production of the civilian receiver and complete rifles at their respective facilities in Texas and Pennsylvania. Some of the machinery and parts which Mr. Ballance purchased for the project came from the Harrington & Richardson plant in Worcester, MA.

M1 to Semi-auto M14 Receiver Conversions - During this time, Mr. Ballance also modified less than fifty Springfield Armory and Winchester M1 Garand receivers to accept the M14 barrel and gas system, to function with M14 magazines, and to fit in M14 stocks. This was completed prior to September 1971. These are the first commercial production M14 type rifles ever made. In 1971, these M1/M14 receivers and complete rifles sold for $100.00 and $250.00, respectively. One of these modified M1 Garand receiver semi-automatic M14 rifles was sold by Collector Firearms in Houston, Texas in 2004 for $2500.00. The workmanship on these modified M1 Garand receivers is excellent.

Jerry’s Guns & Ammo (Hibbing, MN) converted at least two M1 Garand receivers, into semi-automatic only M14 type rifles. One of the receivers was a Winchester M1, serial number 161125. The Jerry’s Guns & Ammo receiver kept a lot of the M1 profile under the stock line but the legs were shortened, the middle portion of the receiver removed, and a bolt lock was added. Under the stock line, the right hand of the receiver was electropenciled: top line - JERRY’S GUNS & AMMO bottom line - HIBBING, MN 55746.

Western Ordnance (Mesa, AZ) performed at least one M1 Garand receiver conversion to semi-automatic M14 in the early 1970s. In 2002, Old Corps Weaponry (Bald Knob, AR) made some M1 Garand receivers capable of accepting M14 magazines. Reportedly, there were several dozen made.

"What's in a name? that which we call a rose By any other name would smell as sweet" - William Shakespeare, *Romeo and Juliet*, 1594. The Bureau of Alcohol, Tobacco and Firearms held the position in 1971 that the M14 rifle was a machine gun as defined by the 1968 Gun Control Act. The Valley Ordnance Co. design receiver was only designed for and capable of semi-automatic fire. Thus, the BATF was of the opinion at the time that it had to be named something other than M14. The text on page 5 of the January 1975 edition of the BATF publication P5300.1 is reproduced here:

M-14 Machine Gun

[photograph of M14 rifle inserted here]

CLASSIFICATION: Machine Gun

DISTINCTIVE CHARACTERISTICS: This is the M-14 Rifle. It generally can be distinguished from the M-1 by shoulder plate, magazine and flash hider. The forestock is also different from that found on the M-1. The Selector Switch on the M-14 Machine Gun is located on the right rear side of the receiver, just above the trigger. All M-14's which are so marked are Machine Guns whether or not equipped with a Selector Switch.

SPECIAL NOTE: The Model M-1A rifle manufactured by the Springfield Armory, San Antonio, Texas is identical in appearance to the M-14, but is NOT a machine gun. The M-1A is a Title I weapon.

RATE OF TRANSFER TAX: $200.00

Apparently, at some point between 1975 and 1985, the BATF changed its stance on the model names M14 and M-14. The model number appears to have lost any relevance to functionality with Class 2 FFL/SOT licensees legally converting M1A rifles to select fire capability as early as May 1974. From 1985 onward, the following firearms manufacturers produced semi-automatic M14 type rifles stamped M14 on the receiver heel: Armscorp of America, Federal Ordnance, Fulton Armory and H&R Gun Co. Likewise, Smith Enterprise, Inc. and Smith Ltd. (Smith Manufacturing Co.) produced semi-automatic rifles marked M-14. In 2007, the BATFE publication *Identification of Firearms Within the Purview of the National Firearms Act* posted on its web site still had the same description of the M14 as the 1975 edition of P5300.1 reproduced above.

Mr. Ballance began marketing the M1A rifle in September 1971. The M1A rifle was first advertised in *Shotgun News* in the November 01, 1971 issue. In October 1971, his Federal Firearms License was in the name of his business, L. H. Gun Company at 3426 Weir Avenue San Antonio, TX 78226. About this time, BATF Agents informed Mr. Ballance that he could not market the M1A rifle because the receiver markings did not bear the name and address of the manufacturer or the distributor. Mr. Ballance promptly applied for a new Federal Firearms License in the name of Springfield Armory, Inc. He agreed to indicate the address on the barrel. Thus, L. H. Gun Company became Springfield Armory, Inc. The name of the closed government arsenal, Springfield Armory, was well known by the public and especially by competition shooters. It turned out to be a successful marketing strategy.

The Commercial M14 Becomes Reality - Production of newly manufactured investment cast M1A receivers began by the end of 1971. For example, M1A receiver serial number 000065 was received by the retail buyer on December 24, 1971. These M1A rifles were assembled from USGI and National Match M14 parts except for the receiver and select fire parts. The Texas business warranted M1A rifles for one year. The first recorded gun show (and public) appearance of the commercial M14 type rifle occurred on January 15 and 16, 1972 at the Ohio Gun Collectors Association show in Canton, OH. Though the temperature dipped to minus 15 degrees Fahrenheit that weekend in Canton, Melvin Smith promoted, but did not sell, the M1A rifle at this and all other gun shows. At this show, Mr. Smith displayed M1A rifles 000003 (in match grade configuration) and 000011 and M1A receiver 000012. In the same row of tables, an OGCA member displayed M1A serial number 000070 dressed in a M14A1 stock, M2 bipod, M14E2 muzzle stabilizer and M14E2 sling. In January 1972, Mr. Ballance sold a stripped M1A receiver for $110.00 and a barreled M1A receiver for $125.00. Mr. Smith continued to display and promote the M1A rifle at Ohio gun shows until at least July 13, 1975.

In January 1972 Valley Ordnance Co. (Wilkes-Barre, PA) was prepared to manufacture all major M1A components. Melvin Smith and Elmer Ballance agreed that Valley Ordnance would be responsible for the manufacture of the components parts and for maintaining an adequate supply of spare parts. Valley Ordnance would handle all quality control on receivers and any barrels that it might make. L. H. Gun Company would supervise all quality control during assembly and final testing and would have the sole right to sell M1A rifles. A large stack of customer orders had been building up. The San Antonio plant was not able to meet the demand. So, the L. H. Gun Company was forced to move to a new facility in Devine, TX. Beginning on February 03, 1972, Springfield Armory, Inc. moved its operations and inventory about thirty-five miles to Route 1 Devine, TX 78016. Mr. Ballance was receiving mail and had telephone phone service at Route 1 Box 210 Devine, Texas 78016 by no later than March 04, 1972. No M1A rifles or receivers were shipped until after an amended Federal Firearms License with the new address was issued on March 23, 1972. Before May 13, 1972, Mr. Ballance was marketing his business as Springfield Armory.

In 1972, M1A rifle serial number 000345 failed in the receiver. The owner was shooting the rifle when the new operating rod parted at the weld joining the tube and the handle sections. The receiver cracked at the bolt lock opening and the last ¼ " to ½ " of the receiver heel struck the owner very lightly in the face. The impact of the receiver heel was so light that the shooter aimed the sights and squeezed the trigger again without realizing what had happened. The firing pin gouged itself into the stock. The shooter was using ammunition marked IBI. Although the receiver was ruined, this incident demonstrated the strength of the M1A rifle. Mr. Ballance replaced the receiver and rebuilt the rifle for the owner at a cost of $12.50 for a new bolt and new operating rod. It was the opinion of Mr. Ballance that the rifle had a loose operating rod guide when it failed. The loose operating rod guide placed a shearing force on the operating rod which resulted in the separation of the operating rod. Mr. Ballance did not perform the original build on this rifle before it failed.

In December 1972, Mr. Jim Lewis of Ohio reported a receiver crack in his M1A rifle serial number 000414. During a session at the range and while changing magazines, he noticed a crack in the receiver heel that ran parallel to the serial number. The crack was visible on the right side of the receiver but the steel held together on the left side. Mr. Lewis also reported “that one of the hammer hooks had broken off.” Mr. Ballance replaced the receiver for Mr. Lewis without cost. Mr. Lewis was not injured.

Beginning in January 1973, the rear end of the M1A receiver bolt right lug slot, located under the rear sight base cover, was extended 0.080 " to the rear to prevent possible damage to the bolt roller. In March 1973, Melvin Smith stated that he would adjust his machine tools to remove less steel from the M1A receiver for all future production in order to strengthen the rear end of the receiver. The author examined M1A receiver serial numbers 000049, 002884, 030061, 042201, 052122, 057969 and 141555 to verify this. M1A receiver serial number 000049 has a maximum thickness of ¼ " at the heel rear wall centerline. M1A receiver 002884 has 5/16 " thickness at the same location. Receiver serial numbers 030061 and higher all have a full 3/8 " thickness at the receiver heel rear wall centerline. Additionally, there is noticeably more uncut steel in the bolt raceways aft of the cartridge clip guide in the receiver serial numbers 002884 and up.

*Guns Illustrated* conducted a test of a bedded but rack grade M1A with a Winchester chromium plated M14 barrel in January 1973. The rifle consistently shot 1.5 to 2 MOA out to 500 yards using 1968 Lake City 173 grain Match and Sierra 168 grain Match hand load ammunition.

In the first quarter of 1973, Mr. Ballance supplied the first recorded commercial 18 " barreled M1A receiver made to Thomas Buss of Springdale, PA. To this, Mr. Buss installed a modified M14 stock with BM59 folding butt stock parts and M14A1 fore grip and a modified gas cylinder lock and front sight assembly to create on March 08, 1973 the M1A Assault Rifle. His M1A Assault Rifle had neither flash suppressor nor muzzle brake. It grouped 4 " at 100 yards in comparison to 2 " groups with the M1A and the Mark IV rifles. The machinist who made these modified gas cylinder lock and front sight assemblies was Ray Kryza of Michigan doing business at the time as H&R Surplus Sales.

Wayne E. Young was a U. S. Army armorer of eighteen years experience in 1973 when he was stationed at the Fort Benning AMTU. His Army service included service with the 9th Infantry Division sniper school in 1968 in the Republic of Viet Nam. He had a Federal Firearms License and his own work shop off base. He built match grade M1 Garand, M1A and Mark IV rifles for civilian competitors. His gunsmithing work was highly regarded by the shooting community. Glenn Nelson, another AMTU armorer, built match grade M1A rifles in the same shop alongside Wayne Young for Elmer Ballance.

On May 06, 1973, a M1A receiver was tested inadvertently when the head separated from a reloaded cartridge during firing. The commercial brass case had been used previously and was loaded with 46.8 grains of H335 gunpowder. All of the bolt parts were blown out of the bolt body including the roller except the ejector spring. The stock was split severely, the magazine blown apart, the hammer broken, the sear torn from the trigger. The receiver was scored by the roller-less bolt and by the firing pin. Close visual examination revealed no other damage to the receiver. The shooter only received a superficial cut to the face. Nonetheless, Mr. Ballance offered to replace the damaged parts and the receiver if magnetic particle inspection or proof firing showed any damage at no cost.

In the fall of 1973, a second improperly hand loaded cartridge caused a M1A receiver to crack but not come apart. Both bolt lugs sheared off when an excessively loaded cartridge was fired. There was no serious injury to the shooter.

The M1A became eligible for use in NRA High Power shooting matches on January 01, 1974. The NRA had modified Rule 3.1.1 in the High Power Rifle Rule Book to allow commercial made M14 type rifles to be used in competition shooting matches. At about the same time, the *American Rifleman* tested and reviewed M1A serial number 001562 in the March 1974 issue. The response to the article was overwhelming. By the third week of March 1974, Mr. Ballance was receiving 200 letters a day. In the July 1974 issue of *American Rifleman*, it was announced that commercial versions of the M14 rifle were acceptable for National Board for the Promotion of Rifle Practice sanctioned Excellence-in-Competition matches.

In early May 1974 Springfield Armory, Inc. moved its operations and inventory to 12106 Radium Drive in San Antonio to cut costs. Production ceased temporarily while equipment and inventory was moved from the Devine facility to the San Antonio facility and set up. An application was submitted to the BATF on May 13, 1974 to change the address on the Federal Firearms License. At this point, *approximately* 2000 receivers and rifles had been shipped. However, rifles and receivers were not sold by serial number sequence. Thus, M1A serial numbers above 002000 were shipped from three locations: 1) Route 1 Box 210 Devine, TX 78016 2) 12106 Radium Drive San Antonio, TX 78216 or 3) Geneseo, IL. The best information available indicates the large majority of the M1A serial numbers shipped from the Radium address were stripped or barreled receivers, not complete rifles. The new FFL was not issued by the BATF until late September 1974. Springfield Armory, Inc. at 12106 Radium Drive San Antonio, TX 78216 shipped M1A stripped and barreled receivers to customers until the end of October 1974.

Mr. Ballance never made or converted any M1A or M14 type rifles to select fire. All of the Texas M1A receiver serial numbers start with a zero. It is not feasible to determine the original model of a Texas M1A by serial number. The serial numbers were logged in as “manufactured complete” regardless of model type, standard, National Match or E2. The serial number was logged a receiver if shipped unassembled. All Texas M1A receivers were test fired by Mr. Ballance, whether sold stripped or with a barrel. Some of the Texas M1A receivers were assembled into complete rifles by U. S. Army armorers at Fort Benning, GA. 100 to 150 of the M1A rifles assembled in Texas were fitted with T44E4 wood stocks with the selector cutout filled in, e.g., M1A serial number 001830. The first T44E4 wood stock was installed on a M1A rifle under serial number 000100. Mr. Ballance charged an additional $100.00 for a M1A rifle fitted with a T44E4 stock and wood hand guard. He purchased these stocks and hand guards from government surplus sales.

**M1A Receiver Shipments from 1971 to 1975**

The following information pertains to Valley Ordnance production of M1A receivers as related by Melvin Smith to Thomas Buss while the two met at Ohio Gun Collector Association shows from 1971 to 1975.

December 24, 1971 - M1A receiver serial number 000065 was received by the original buyer.

January 15, 1972 - Serial numbers over 000400 were being shipped to Texas.

September 23, 1972 - M1A serial number 001056 was the latest finished receiver.

November 11, 1972 - The latest M1A serial number was over 001200.

July 14, 1973 - The latest finished M1A receiver was serial number 001838.

September 22, 1973 - The latest finished M1A receiver was approximately 002150. M1A rifle serial numbers being shipped from Texas were above 001500.

January 19, 1974 - The latest finished M1A receiver was 002504. M1A serial number 001727 was received by the original buyer this month.

July 13, 1974 - M1A receiver 003396 was recently finished.

September 21, 1974 - Valley Ordnance recently resumed production of M1A receivers after a six week shutdown period.

January 18, 1975 - The original buyer took delivery this month of M1A receiver serial number 003322 from Springfield Armory, Inc. in Geneseo, IL.

March 01, 1975 - The latest finished receiver was 004164.

July 12, 1975 - Valley Ordnance Co. had manufactured more than 5000 M1A receivers to date.

**The Texas M1A**

From a L. H. Gun Co. brochure mailed on January 06, 1973 from Devine, Texas, M1A models and prices were as follows:

Standard model with fiberglass stock $200.00
Standard model with new walnut stock $225.00 or used walnut stock $215.00
Standard model with new beech stock $215.00 or used beech stock $200.00

M1AE2 with birch stock $250.00
M1AE2 with bipod $275.00
Match grade model with walnut stock $250.00
New issue bayonet $5.00

All M1A complete rifles assembled in Texas had the address where it was assembled indicated on the barrel. These barrel markings were typically located on the underside between the gas cylinder and the flash suppressor but some were stamped between the front band and the chamber. There were three barrel address markings for the Texas company.

The marking L H GUN CO S A TEX 78226 was found on the first 100 rifles assembled by Mr. Ballance. Additionally, a few of these hand stamped barrels were shipped to armorers at Fort Benning. This stamping was done by hand in two lines using serif font characters. L H GUN CO is on the first line and S A TEX 78226 is on the second line.

With the move to Devine, TX the M1A barrel marking was changed to one of three variations: 1) RT I BOX 2I0 DEVINE TEX 2) RT I BX 210 DEVINE TX or 3) DEVINE TEX. The full Devine address marking was initially done in two lines with RT I BOX 2I0 or RT I BX 210 on the first line then DEVINE TEX or DEVINE TX on the second line. The two line Devine address marking has been observed as late as M1A serial number 001389. At some point, the Devine address marking was applied in one line to avoid indexing the barrel. The short address marking DEVINE TEX has been observed on M1A rifle serial numbers as low as 000589 and as high as 000857. This shortened address, DEVINE TEX, has been authenticated by Mr. Ballance in two signed letters to subsequent owners of M1A serial number 000710.

The first Devine address barrel markings appeared in the spring of 1972 on assembled M1A rifles beginning at about serial number 00013X. At least some barreled M1A receivers were not stamped on the barrel, e.g., 000172 and 000214 had no address markings. The original owner received both barreled M1A receivers, 000172 and 000214, on April 21, 1972 from L. H. Gun Company in San Antonio, TX. The Devine address marking was used as high as M1A serial number 002877 which was likely shipped in April or May 1974.

The third Texas address barrel marking was 12106 RADIUM SA TEX 78216. This third barrel marking first appeared on the M1A barrels some time between May and September 1974. This address was a one line marking. The Radium San Antonio address marking appeared as early as M1A serial number 002134. Most, if not all, of the rifles built with the third (12106 RADIUM SA TEX 78216) address barrel marking were assembled by Fort Benning armorer Fred Cousy.

Springfield Armory, Inc. in Texas marked the barrels at the time of barrel installation. The barrels were marked by Mr. Ballance and by his employees. In the summer and fall of

1974, Mr. Chuck Krause was employed by Springfield Armory, Inc. On at least two M1A rifles assembled by him, he stamped his home address RT I BOX338C DEVINE TEX. One of these M1A rifles was serial number 002898. Mr. Krause was a neighbor of Mr. Ballance but the FFL address for Springfield Armory, Inc. was not the home of Mr. Krause. Mr. Ballance never used Canadian Arsenals barrels in the assembly of M1A rifles because he did not have any from that maker in his parts inventory.

The barrel of M1A serial number 000564 was electropenciled during assembly as follows: top line - DRW 430, middle line - Devine, bottom line - Texas. The bottom of the bolt and the inboard side of the operating rod were electropenciled 564. The electropenciling appears to have been done by the same person. The May 15, 1973 issue of *Shotgun News* listed a sales advertisement for Springfield Armory, Inc. The ad gave the address for Springfield Armory, Inc. as P.O. Drawer No. 430 Mailing Address RT. 1 Box 210 Business Address Devine, Texas 78016 and included a 512 area code phone number. In September 2006, the owner of M1A serial number 000564 confirmed by telephone interview with Mr. Ballance that it was shipped to Fort Benning by him as a stripped receiver in trade for services rendered. There were approximately 120 such bare and barreled receivers built into complete rifles by Wayne Young and Glenn Nelson for Elmer Ballance.

A very few Texas marked barrels were sent to Geneseo, Illinois. The barrels on the first M1A rifles leaving the Illinois factory were electro-penciled Geneseo Ill. However, M1A rifles in 1975 were sold with a coupon to be used towards the purchase of a spare barrel. Thus, a very few of the spare barrels sold by the Illinois company had Texas markings. It is likely that a very small number of individuals eventually had these Texas marked spare barrels installed on M1A rifles sold by Springfield Armory, Inc. in Illinois.

**Transition from Texas to Illinois**

An advertisement announcing the sale of Springfield Armory, Inc. in Texas appeared in the September 01, 1974 issue of *Shotgun News*. Springfield Armory, Inc. changed ownership in the first ten days of November 1974 from Elmer Ballance to Bob Reese at 218 North State Street Geneseo, Illinois 61254. [1] The transfer of the company assets included all of the unused receivers and barrels and many of the USGI parts. Production problems troubled the Reese family for some time. These problems were sorted out over a few months and M1A production resumed by the spring of 1975.

When the Texas company receivers had been used up, Valley Ordnance continued to supply finished M1A receivers to the Illinois company. It did so until July 1996 when Melvin Smith passed away. The bare receivers, barrels and other parts left over from the Texas firm were used to help start production of the M1A rifle in Illinois.

The M1A serial number transition from Texas to Illinois occurs from about 002700 to approximately 003300.

The following individual cases serve to illustrate the transition M1A serial numbers.

Serial number 002709 - M1A serial number 002709 was shipped as a bare receiver to the original buyer in November 1974. This is the lowest known M1A serial number sold from Springfield Armory, Inc. located in Geneseo, IL.

Serial number 002734 - M1A serial number 002734 was shipped from Geneseo, Illinois on April 28, 1975. Geneseo Ill is electro-penciled on the barrel of M1A serial number 002734.

Serial number 0028XX - An M1A with serial number 0028XX has been identified with the 12106 RADIUM SA TEX 78216 marking on the barrel.

Serial number 002831 - M1A serial number 002831 was sold new to the original owner by a FFL on February 19, 1975. The price was $309.75 including sales tax. The barrel has the marking RT I BX 210 DEVINE TEX. It is likely that this rifle was assembled in Geneseo, IL with a Texas marked barrel.

Serial numbers 002867 and 002874 – M1A serial number 002874 has the following one line address marking on the barrel: RT I BX 210 DEVINE TEX. According to the original owner and his purchase receipt, M1A rifles with serial numbers 002867 and 002874 were shipped from Devine, TX in May 1974 to his local FFL. Both rifles were then promptly sold to him.

Serial number 002877 – This M1A rifle has an October 1962 production Harrington & Richardson chromium plated barrel. The barrel marking is identical to M1A serial number 002831 except there is an O between B and X. Springfield Armory, Inc. in Geneseo, IL has no record of this serial number.

Serial number 003139 – M1A serial number 003139 has the 12106 RADIUM SA TEX 78216 marking on the barrel.

Serial number 003159 - Stripped M1A receiver serial number 003159 was received by the original owner on November 01, 1974 from Springfield Armory, Inc. at 12106 Radium Drive San Antonio, TX 78216.

**Illinois Production**

Bob Reese was an Illinois soybean farmer with an enduring passion for firearms. At some point after World War II, he bought military surplus items including firearms parts. He went into business as Reese Surplus Sales, Inc. in December 1963. There was a strong public demand for the M1 Garand rifle. Bob Reese served the non-competitor market demand by welding cut M1 Garand receivers back together to help meet this demand. Reese Surplus, Inc. purchased the Texas business, Springfield Armory, Inc., in the fall of 1974 and incorporated as a separate entity on January 24, 1977. Bob Reese, his wife and their sons, Tom, David and Dennis, have built the business into an American success story. Starting out in the barns of the family farm and growing to forty employees by 1986, firearms manufacture and assembly have been done in its Geneseo, Illinois factory for decades now. In the 1980s, Bob Reese sold the business to his two sons, Tom and Dennis Reese. Tom and Dennis Reese serve as Co-Chairmen with Dennis as the Chief Executive Officer for the firm. As of June 2007, Springfield Armory, Inc. employed 135 persons.

In addition to the M1A, Springfield Armory, Inc. of Illinois has made the M1911 pistol, M1 Garand, SAR 48 and BM59 rifles, and the M60 machine gun. The M1 Garand and BM59 receivers were made by Springfield Armory, Inc. and assembled with surplus parts. The Springfield Armory, Inc. M1 Garand was introduced in 1979 and its BM59 debuted in 1981. BM59 rifles and parts are still available through its sister company, Reese Surplus, Inc. The Italian firearms manufacturer, Fabbrica d' Armi Pietro Beretta, developed the BM59 rifle from 1957 to 1958. Like the M14, the BM59 is a descendant of the M1 Garand rifle.

The M1A receiver design was further changed between serial numbers 002884 and 010048 to include a small hemisphere on the outboard side of the rear sight pocket right ear for use of a ball bearing to engage a detent on a newly designed match windage knob. This windage knob allowed ½ minute of angle sight adjustments by allowing eight "clicks" per revolution of the knob. Original USGI NM sights used a more delicate fine thread on the windage knob and rear sight base to effect ½ minute windage adjustments with four "clicks" per revolution.

Springfield Armory, Inc. made further changes to the receiver geometry around serial number 040000. The chamber was moved very slightly forward to improve accuracy and increase bolt lock up time. Some Springfield Armory, Inc. M1A receivers have a ridge on the bottom right hand side that may slightly interfere with the fit of some stocks. It appears to have been a part of the finished casting. This ridge has been identified on M1A rifle serial numbers as low as 000049 until somewhere between 0343XX and 0422XX. The bottom side ridge was removed from the design as part of the changes made for economic reasons. It meant two less machining cuts but it also had the benefit of a better fit with various makes of stocks. Prior to the May 1986 ban on new manufacture machine guns, Springfield Armory, Inc. had a Full Auto Department that manufactured and assembled select fire M1A rifles.

Springfield Armory, Inc. M1A rifles with serial numbers under 084000 were reportedly made prior to the September 13, 1994 effective date of the U. S. Violent Crime Control and Law Enforcement Act. Springfield Armory, Inc. sold stripped receivers manufactured prior to September 13, 1994 as well. If the stripped receiver was not assembled into a complete rifle by September 13, 1994 it was considered a post-'94 ban firearm by the BATF. During the ten years of the 1994 Assault Weapons Ban, specific features could not be added to M14 type rifles assembled for civilian sale after September 13, 1994 within the United States. These federal restrictions were automatically repealed by the sunset provision (automatic expiration of the law absent further Congressional action) of the same law on September 13, 2004. State and local laws are still in effect though. Certainly, the 1994 Assault Weapons Ban had no adverse effect on the popularity of the M1A. M1A serial number 166761 was built on August 26, 2004, just before the repeal of the ban. Springfield Armory, Inc. had USGI M14 parts kits available to them for assembly of M1A rifles at least through the 100XXX serial number range.

M1A receivers were cast by Alphacasting, Inc. (St-Laurent, Quebec, Canada) for Springfield Armory, Inc. for about one year in the 2003 - 2004 period. Alphacasting, Inc. made the M1A receiver by the lost wax investment casting method. In business since 1991, it is a precision casting firm that makes parts from aluminum, bronze, and many grades of carbon and stainless steels. As of 2009, M1A receivers are supplied by a vendor. The rough machining is done by an Illinois machine shop. Finish machining and headspacing is performed in-house.

At Springfield Armory, Inc., all basic rifle assemblers have a minimum of two years experience assembling rifles before they are allowed to assemble rifles on their own. A rifle is test fired with five rounds for function and has to function through all five rounds or it doesn't get shipped. If it fails for any reason, it gets torn down and rebuilt. Then the rifle is tested for five rounds again.

On rare occasion, the M1A receiver heel has been stamped erroneously. The letter I is missing from SPRINGFIELD on receiver serial number 062857. The serial number, 064922, is stamped to the right of center on the receiver heel. About 300 receivers in the 165XXX serial number range were stamped AROMRY instead of ARMORY. Specific examples of AROMRY marked M1A receiver serial numbers are 165345, 165389, 165412 and 165418. Obviously, these unintentional markings are only cosmetic in nature and have no bearing on the fit or function of the rifle.

M1A Packaging – After assembly and testing, the M1A rifles are packed for shipment. A brightly colored plastic empty chamber indicator is inserted into the chamber and the bolt closed on it. The factory headspace and safety warning tags are attached to the trigger guard. Then the M1A rifle is inserted into a plastic sleeve and placed inside a cardboard shipping box. The shipping box also contains an owner's manual, safety literature, warranty information, and accessories and parts sales brochures. Springfield Armory, Inc. M1A rifles had a limited warranty for one year after the initial purchase for the period September 01, 1985 until December 31, 1992. Effective January 01, 1993, Springfield Armory, Inc. M1A rifles are sold with a limited lifetime warranty that applies to the original retail buyer. In recent years, a gun lock has been included. The shipping boxes were green and white in color until sometime between serial number 07157X (winter 1993) and 075XXX (fall 1993) when they were changed to blue and white.

**Illinois M1A Models**

In the August 01, 1975 issue of *Shotgun News*, two M1A models were available, standard and match. At about this time, the Super Match M1A was introduced in the August and October 1975 issues of *American Rifleman.* These first Super Match M1A rifles had Shilen eight groove 1:12 twist molybdenum-chromium alloy steel barrels. The M1A with a USGI M14 NM barrel became known as the National Match M1A. This selection of M1A models, standard, National Match and Super Match, continues until 1981. All three models were available from the factory during 1978 and 1979 in M1AE2 configuration (assembled with a USGI M14E2 stock). In 1985 and 1987, the M1A was available in four models, Standard, National Match, Super Match and M1A-A1 Bush Assault. The manufacturer's suggested retail price for the Standard M1A in 1985 was about $650.00 and in 1987 it was $782.00. The Match Shop at Springfield Armory, Inc. builds the National Match, Super Match, M21 and M25 model rifles.

Bush and Scout Squad M1A - Through the years, the M1A with an 18 " barrel has been available at different times as the M1A-A1, M1A-A1 Bush Assault, M1A Bush and M1A Scout Squad model. The 18" barrel M1A model series debuted in 1981 with the M1A-A1 model, later known as the M1A Bush. The factory model designator, M1A-A1, was used until at least serial number 074XXX in 1993. The M1A Bush model was offered until 1999 with the exception of a brief comeback in 2002 and 2003. The M1A Bush was available in six different stock choices throughout its production: commercial walnut, USGI wood, black laminated wood, black synthetic with folding butt stock (discontinued by September 1994), black synthetic, and mossy oak camouflage synthetic (2003 only).

The Bush and Scout Squad models are similar to each other. Each has an 18 " 1:11 twist six groove non-plated molybdenum-chromium alloy steel barrel and synthetic stock. The Scout Squad has a scope mount installed on the barrel and was also available in a walnut stock. The barrel scope mount will fit on a standard model M1A barrel and it is available separately. The M1A Scout Squad was a variation of the M1A Bush model.

The M1A Scout Squad model was first marketed for sale in 1996. It has been offered in five different stocks through the years: commercial walnut, USGI wood (discontinued in 1998), black laminated wood (discontinued in 1998), black textured fiberglass and mossy oak camouflage synthetic. The butt stock on the 18 " barrel M1A rifles has been fitted with a USGI butt plate or commercial rubber butt pad.

Between 1999 and 2003, Boyds' Gunstock Industries became the supplier of walnut M1A stocks to Springfield Armory, Inc. Beginning in July 2005 Springfield Armory, Inc. switched from a textured black surface on synthetic M1A stocks to its second generation version, a smooth and more durable black finish fiberglass stock.

Small Production Run M1A Models – Springfield Armory, Inc. has produced a number of small production lot M1A rifles through the years.

1) M14 Vietnam Commemorative - Springfield Armory, Inc. offered the M14 Vietnam Commemorative rifle in the 1980s. There were two models, US Army Commemorative M14 and US Marine Corps Commemorative M14. No more than 1,500 of each model were produced. The receiver serial numbers had AR and MC prefixes, respectively, followed by four digits. Likewise, the outboard side of the operating rod handle was marked US Army Commemorative M14 or US Marine Corps Commemorative M14 as appropriate. Metal parts were given a blued finish or 24 karat gold plating. Gold plated parts included the safety, trigger, rear sight knobs, cartridge clip guide, front and rear sling swivels, front band, spindle valve, gas cylinder plug and front sight. A service branch medallion was inletted to the right side of the butt stock. The Army medallion was green and gold. The Marine Corps medallion was red and gold. The outer circumference of the stock medallion bore the inscription VIETNAM REMEMBERED GALLANTRY DUTY DEVOTION for both models. Standard with each rifle was a leather M1907 type leather sling, a blued finish twenty round magazine, an Army M14 technical manual and a certificate of authenticity. Optional items included a walnut display case, M6 bayonet with a blued finish blade, M8A1 scabbard, cleaning kit, and a brass name plate placed on the right side fore end of the select grade walnut stock. There was no selector cutout on the stocks. The walnut display case was lined with green velvet for AR series rifles and red velvet for MC series rifles.

2) Gold Series - In 1987, this competition model M1A was offered in a choice of stocks, oversized National Match walnut or aramid material, and in a choice of match barrels, heavyweight Douglas molybdenum-chromium alloy steel or Hart stainless steel.

3) Sport Master - The receiver heel of the Sport Master is stamped as follows from top to bottom: first line – U S RIFLE second line – SPORT MASTER third line – SPRINGFIELD ARMORY fourth line – SM0XXX. These rifles had either a solid walnut or gray wood laminate stock with an integral cheek rest as part of the butt stock and a bipod stud in place of the front sling swivel. These are believed to have been made only in 1991.

4) Even Thousand Collector Edition – In 1991, Springfield Armory, Inc. produced a small batch of collector grade M1A rifles and an unknown number of M1911A1 pistols. According to a very reliable source, there were probably no more than sixty M1A rifles produced of this type. These rifles had a matte blued finish and gold plated triggers. The handle portion of the operating rod was marked COLLECTORS EDITION. The highly polished wood stock was inlaid with a large medallion applied to the right side of the butt stock. The medallions were marked Collectors Edition and Even Thousand Serial Number. The receiver serial numbers were even thousand numbered, e.g., 15000.

5) IDF M1A - In the late 1990s Springfield Armory, Inc. bought the parts from some Israeli Defense Force M14 rifles. The parts from these rifles, including the Harris bipods, Israeli Military Industries stocks and scope mounts and Nimrod 6X range finding scopes, were assembled on to commercial Springfield Armory receivers with heavy weight match grade barrels. They were sold as a limited run model in 1999. The IDF M1A receiver heels are

marked with the Star of David just below the serial number. Each IDF M1A was issued a Certificate of Authenticity as part of the literature packed inside the factory shipping box.

6) M25 - The M25 rifle recognizes the service of the late Gunnery Sergeant, USMC (Retired) Carlos N. Hathcock, II. Gunnery Sergeant Hathcock was a sniper who served his country admirably in the Viet Nam War. He is credited with ninety-three confirmed kills and a total of over 300 unconfirmed kills. The Viet Cong nicknamed him “Long Trang,” which means “white feather” in the Vietnamese language, because he wore a small white feather in his cover (Marine term for hat) while in the field. Gunnery Sergeant Hathcock passed away in February 1999. The M25 was built with a 22 " Krieger molybdenum-chromium alloy steel heavyweight 1:10 twist barrel, McMIllan M3A stock, Springfield Armory, Inc. rear lugged M25 receiver, Match Shop tuned firing mechanism and custom muzzle brake and stabilizer. A special logo and a likeness of the signature of Carlos Hathcock was engraved on the receiver. This high-end model was introduced in 2001.

7) Vietnam War Commemorative M14 – About 1998, Springfield Armory, Inc. produced a run of 500 Vietnam War Commemorative semi-automatic M14 type rifles. These M1A rifles were available for sale through the American Historical Foundation. This model was fitted with a Reinhart Fajen designed walnut stock containing a circular badge on the right hand side of the butt stock. The stock badge consisted of a red Oriental dragon walking through white color bamboo shoots all against a yellow background. The badge was inscribed with the words REPUBLIC OF VIETNAM SERVICE. It had the following 24 karat gold plated parts: lugless flash suppressor, front sight, safety, front and rear sling swivels, rear sight assembly, trigger and magazine latch. The receiver and operating rod were etched and gold-gilt filled with symbols and inscriptions. The operating rod was marked VIETNAM WAR COMMEMORATIVE M14 and had an American flag to the rear of the inscription. The receiver heel serial numbers were stamped VME001 through VME500 along with its factory M1A serial number, VME356 is M1A serial number 109387. VME is an acronym for Vietnam-Museum Edition. Each unit of this model was issued with a ten round magazine, a USGI field manual, a black M1907 style leather sling and a Certificate of Authenticity.

8) Camp Perry Limited Edition - Springfield Armory, Inc. produced 500 match grade M1A rifles to commemorate the 100 year anniversary of Camp Perry. The Camp Perry Limited Edition rifle was given a walnut stock with a commemorative design carved into the right hand side of the butt stock. Additional lettering was engraved on the on the receiver and the operating rod. The right side of the receiver heel was marked with the individual rifle number of the series, e.g., 24 of 500. The operating rod had a gold National Rifle Association logo and gold italicized font that read Camp Perry 1907-2007. Each rifle came with a special carry case and a certificate of authenticity. This model was advertised in the 2008 catalog.

Springfield Armory, Inc. M1A rifles have been exported to Australia, Belgium, Canada, Finland, Germany, Italy, Japan, the Netherlands, New Zealand, Sweden, Switzerland and United Kingdom for sale to private individuals. Additionally, a small quantity of M1A Scout Squad rifles have been issued to Australian Special Forces units. According to available BATFE figures, Springfield Armory, Inc. exported the following quantities of rifles: 1999 - 2, 2000 - 69, 2001 - 12, 2002 - 75, 2003 - 232, 2005 - 241 and 2006 - 152. Private citizens in Japan may not own hand guns or automatic weapons but can own shot guns and rifles. To own a rifle, the citizen must possess ten years of experience with a shot gun or a letter of recommendation from a government recognized shooting club. In Sweden, USGI and commercial M14 (and other firearm) receivers, barrels and bolts may be owned by private individuals after obtaining government permits. From Germany, M1A rifles have been exported to Luxembourg for sale to private individuals. Nioa Trading (Banyo, Queensland) first imported M1A rifles into Australia in 1985 or 1986. The company has remained the sole importer of M1A rifles for Australia. M1A rifles have also been offered for sale to U. S. military members and their dependents through the Army and Air Force Exchange Service and the Navy Exchange at locations such as Fort Richardson (Anchorage, AK) and Camp Allen (Norfolk, VA).

Collector Edition M1A - M1A rifles have been offered in a number of models with USGI stocks. The Springfield Armory, Inc. May 01, 1998 factory price list had catalog number MA9851 for the M1A with a USGI wood stock and stainless steel barrel at a suggested retail price of $1351.00. The Collector Edition M1A, catalog number MA9103, was a standard model offered in 2002 and 2003. It had a USGI chromium plated barrel and USGI birch stock. Catalog number MA9101 debuted in 2006 as a standard model M1A with a USGI wood stock.

Standard M1A - The standard model M1A has a 1:12 twist four groove molybdenum-chromium alloy barrel with a standard size rear sight and either a standard or a National Match front sight. Standard M1A rifles have been assembled with a variety of stocks: commercial walnut (beginning in 1993), commercial birch (discontinued in 2003), USGI wood, brown or black laminated wood (1996 to 2000 production), black synthetic, woodland camouflage synthetic (1987 to 1996 production), or mossy oak camouflage synthetic (introduced in 2003) stocks.

When available, Springfield Armory installed USGI chromium plated barrels on the standard M1A models. If a M1A rifle was assembled at Springfield Armory, Inc. with a Harrington & Richardson M14 barrel, the barrel was inspected prior to installation for proper chamber diameter. During times of scarcity, such as 1978 to 1986 and beginning January 2004 (by serial number 161920), Springfield Armory, Inc. installed Wilson Arms commercial manufacture non-plated standard contour barrels instead. In the past, Hillside Manufacturing did the barrel machining on Wilson Arms barrel blanks. Today, Springfield Armory, Inc. buys the barrel blanks from suppliers then performs the finish machining of the barrels itself. After January 2004, a few Standard M1A rifles were assembled with USGI chromium plated barrels.

Loaded Standard M1A - The Loaded Standard M1A model debuted on September 01, 1996. This model, MA9201, included a medium weight National Match barrel, National Match tuned firing mechanism, and National Match flash suppressor. This promotional version of the Loaded Standard model was shipped from the factory with three twenty round magazines. Unfortunately, the retail buyer wasn't made aware of the extra two magazines at the time of purchase in some instances. Consequently, some retail buyers only found one magazine in the shipping box after leaving the retail shop. M1A model MA9201 was available until December 31, 1997. In November 2006, Model MA9827 was introduced. This was the MA9826 loaded standard model fitted with an aluminum rail system.

The following rifles are offered with either molybdenum-chromium alloy steel or stainless steel barrels:

A) The loaded standard M1A has a 1:11 twist medium weight match barrel, National Match modified flash suppressor, 0.0520 " non-hooded rear sight aperture and National Match front sight, tuned firing mechanism and either USGI wood (discontinued in 2000), commercial walnut, or black synthetic stock.

B) The National Match M1A comes glass bedded in an oversized match grade walnut stock with all of the features of the loaded model plus a National Match gas cylinder, match-fitted operating rod, match-modified operating rod spring guide and National Match hooded rear sight aperture (described above as part of the M14 NM rifle modifications). Since 1991 onward, a glass bedded walnut stock has been standard dress for the National Match M1A. In years past, the National Match M1A had been built with fiberglass, fancy burley walnut or laminated walnut/maple stocks. The National Match M1A was available with a medium weight stainless steel barrel beginning in 1999.

C) Throughout its production history, the Super Match M1A model has been made with a standard receiver, a rear lugged receiver or a double lugged receiver. Super Match M1A models were built without a lugged receiver as late as 1990. From 1991 onward, Super Match M1A receivers were manufactured with a rear lug as a standard feature. A front lug was added per customer request. The Super Match M1A was fitted with a 1:10 twist heavyweight Douglas barrel unless the customer selected another brand of barrel. Regardless of the barrel make, the operating rod will slide through an oversized operating rod guide made to fit the barrel's larger diameter at that area. The buyer also had the choice of an oversized walnut, fancy burley walnut, laminated walnut/maple, McMillan camouflage or black fiberglass stock.

D) The Springfield Armory, Inc. M21 is the rear lugged Super Match M1A with a walnut stock that has an adjustable cheek rest. This model was introduced in 1990.

E) The M25 rifle offered by Springfield Armory, Inc. has a rear lugged receiver, McMillan fiberglass stock with adjustable cheek piece, low profile custom muzzle brake, Krieger

1:10 twist heavyweight barrel and no iron sights. The M25 must be scoped to sight a target. There is no cartridge clip guide or receiver scope mount bolt hole on this model. The scope attaches to a rail mounted over the bolt.

New in 2004, the M1A SOCOM 16 model weighed 8.9 pounds and had a 16.25 " 1:11 twist six groove non-plated molybdenum-chromium alloy barrel and black color hand guard and synthetic stock. The overall length was reduced about 7 " from the standard model to 37.25 ". The synthetic stock had a steel hinged butt plate. The hand guard was cut out to accommodate the installed M1A Scout Squad scope mount. The visible portion of the operating rod was stamped SOCOM 16 on 2004 production M1A SOCOM 16 models. The front sight was an XS Sight Systems 24/7 0.125 " wide stripe post. The rear sight aperture diameter was enlarged to 0.125 ". This change in the sights was done to facilitate faster target acquisition at Close Quarters Battle ranges. On 2007 models, the M1A SOCOM 16 operating rod rail is marked SOCOM 16.

The M1A SOCOM barrel gas port was enlarged to the same dimension as the M1A Scout Squad barrel. Both model barrels have gas ports larger than the USGI 22 " chromium plated barrel dimension. The M1A SOCOM barrel muzzle was fitted with a proprietary design combination muzzle brake and gas cylinder lock assembly. The barrel used on the SOCOM models has a proprietary muzzle thread, 43/64 " diameter with a pitch of 40 right hand threads per inch. The SOCOM 16 gas system and muzzle attachment was designed by Dale Rader and first tested in 2003. The pre-production design gas cylinder plug was flush with the gas cylinder end. It was removed and installed with a hex head wrench. Between February and April 2004, the gas cylinder plug design was changed. Thus, 2004 and early 2005 production M1A SOCOM models were fitted with a proprietary gas cylinder plug machined with two cylindrical profile sections sans knurling in lieu of the traditional USGI design part. Beginning in early 2005, M1A SOCOM 16 models were assembled with the traditional design commercial manufacture M14 gas cylinder plug. Like other M1A models, the SOCOM 16 gas cylinder plug can be removed and installed using a M14 combination tool or 3/8 " wrench. After the gas cylinder plug is removed, the M1A SOCOM series combination muzzle brake and gas cylinder lock assembly can be unthreaded from the barrel.

The National Shooting Sports Foundation (Newtown, CT) owns and sponsors the annual Shooting, Hunting, and Outdoor Trade (SHOT) Show. Beginning in 1979, the SHOT Show quickly became the largest gathering of firearms, hunting and outdoor product businesses in the world. The SHOT Show has grown steadily in attendance and floor space through its history.

In 2005, Springfield Armory, Inc. upgraded the M1A SOCOM 16 design with the introduction of three new models, the SOCOM II, the SOCOM II LE, and the SOCOM 16 Urban. These new M1A rifles were debuted at the 2005 SHOT Show. The M1A SOCOM II LE is based on the 2004 M1A SOCOM 16 but with significant differences. It is equipped with a VItor Weapons Systems (Tucson, AZ) supplied collapsing butt stock, a pistol grip and an aluminum rail mount system that surrounds the black color synthetic stock. The M1A SOCOM II LE is marketed to government agencies and military forces so it is not listed in the firm's retail catalog or on its web site. The M1A SOCOM II is the same as the M1A SOCOM II LE but sports a traditional black color synthetic stock with steel hinged butt plate. The M1A SOCOM II operating rod was marked SOCOM II. The M1A SOCOM II weighs 10.5 pounds without a magazine. In 2007, the M1A SOCOM II with an extended rail cluster was introduced. The M1A SOCOM II and M1A SOCOM II LE models lose the front sling swivel because of the rail system mount. Additionally, these models retained the M1A SOCOM 16 rear and front sights and the traditional design commercial manufacture gas cylinder plug.

The M1A SOCOM 16 models come in a choice of black color or black and gray camouflage pattern synthetic stock. A traditional wood M14 stock will fit a M1A SOCOM 16 but it will require modification to clear the operating rod guide clamp on a M1A SOCOM II. The M1A SOCOM series models have been outfitted with the steel hinged butt plate or a rubber butt pad on the stock.

**Springfield Armory, Inc. M1A Catalog Numbers**

Catalog numbers were used by Springfield Armory, Inc. beginning no later than 1989. Catalog numbers were indicated on the end of the factory shipping box. If the factory installed a California compliant muzzle brake on a model that was available with a flash suppressor, the letters CA are added at the end of the catalog number, e.g., MA9102CA. The change to a muzzle brake became mandatory for M14 type rifles sold in California after December 31, 1999. M1A rifles were assembled with molybdenum-chromium alloy steel barrels unless otherwise noted. Though not complete, the following is a list of catalog numbers used by Springfield Armory, Inc. over the years.

**Table 14: Springfield Armory, Inc. M1A Catalog Numbers**

| Catalog Number | Model M1A Description |
|---|---|
| AA9102 | M1A-A1 / M1A Bush with commercial walnut stock |
| AA9104 | M1A-A1 / M1A Bush with black or mossy oak fiberglass stock |
| AA9110 | M1A-A1 / M1A Bush with Choate black fiberglass folding stock |
| AA9116 | M1A-A1 / M1A Bush with wood laminate stock |
| AA9117 | M1A-A1 with camouflage fiberglass stock |

| | |
|---|---|
| AA9122 | Scout Squad with commercial walnut stock |
| AA9124 | Scout Squad with mossy oak stock |
| AA9126 | Scout Squad with black fiberglass stock |
| AA9626 | SOCOM (2004 production) and SOCOM 16 (2005 and later production) |
| AA9627 | SOCOM II with second generation black fiberglass stock |
| AA9628 | SOCOM 16 Urban (2005 and 2006 production) and SOCOM II Urban Camo (2007 and later production) |
| AA9629 | SOCOM II extended rail cluster with black fiberglass stock |
| MA9101 | collector edition with standard contour barrel and USGI wood stock |
| MA9102 | standard with commercial walnut stock |
| MA9103 | collector edition with USGI barrel and USGI birch stock |
| MA9104 | standard with mossy oak stock |
| MA9106 | standard with black fiberglass stock |
| MA9108 | standard with birch M14E2 stock |
| MA9117 | standard with woodland camouflage fiberglass stock |
| MA9201 | loaded standard -promotional (1996 and 1997 production) |
| MA9222 | loaded standard with commercial walnut stock |
| MA9225 | loaded standard with wood laminate stock |
| MA9226 | loaded standard with black fiberglass stock |
| MA9801 | loaded standard with walnut USGI stock and stainless steel NM medium weight barrel (1997 production) |

| | |
|---|---|
| MA9806 | loaded standard with black fiberglass stock and stainless steel NM medium weight barrel (1997 production) |
| MA9822 | loaded standard with commercial walnut stock and stainless steel NM medium weight barrel |
| MA9825 | loaded standard with laminate wood stock and stainless steel NM medium weight barrel (1999 production) |
| MA9826 | loaded standard with black fiberglass stock and stainless steel NM medium weight barrel (2006 production) |
| MA9827 | loaded standard with black fiberglass stock, stainless steel NM medium weight barrel and cluster rail |
| MA9851 | collector edition with stainless steel barrel and USGI wood stock |
| MA9900 | receiver |
| MA9903 | rear lugged receiver |
| NA9102 | National Match with medium weight barrel |
| NA9802 | National Match with stainless steel medium weight barrel |
| SA9102 | Super Match with oversized commercial walnut stock |
| SA9115 | Super Match with Shaw stock and Douglas barrel |
| SA9121 | M21 with Douglas NM heavyweight barrel |
| SA9131 | M21 with Krieger stainless steel NM heavyweight barrel |
| SA9502 | M25 with Krieger molybdenum-chromium alloy steel barrel or Krieger stainless steel barrel |
| SA9802 | Super Match with oversized commercial walnut stock and Douglas stainless steel barrel |
| SA9804 | Super Match with black McMillan stock and Douglas stainless steel barrel |

| | |
|---|---|
| SA9805 | Super Match with camouflage McMillan stock and Douglas stainless steel barrel |

**Gray-Syracuse, Inc., Valley Ordnance Co. and Hillside Manufacturing**

H. P. Gray founded Gray-Syracuse, Inc. in 1943 as a business to produce investment castings. Its first plant was located in Syracuse, NY. The company purchased a sand casting facility in Manlius, NY in 1953 and converted it to making parts by investment casting. In the 1960s, the company expanded its customer base to include the atomic energy, space and aerospace industries. In 1975, the company moved its operations to a new, larger facility in Chittenango, NY. Gray-Syracuse was purchased by ESCO Corporation in 1987.

Gray-Syracuse made the raw M1A receiver castings starting around 1973 or 1974 until some time after July 1996 but before April 1999. The casting supplier that preceded Gray-Syracuse has not been discovered. The raw castings and certification papers for each production lot were shipped from Gray-Syracuse to Valley Ordnance until closing in July 1996. Valley Ordnance had been located at 280-282 North Main Street Wilkes-Barre, PA 18702. Valley Ordnance would then send the receivers on to Springfield Armory, Inc. At some point between M1A receiver serial numbers 0320XX and 033964, the pour lot code was made a part of the raw casting. This number is found on the underside of the receiver just behind the left leg. This is denoted by one of two formats:

1) the letter A followed by a two or three digit number, e.g., A178 or 2) a five digit number followed by a hyphen then followed by a two digit number, e.g., 14132-01. Valley Ordnance machined receivers had letter A prefix numbers for the pour lot. Casting pour lot numbers observed with the letter A prefix have been as high as A193 on receiver serial number 098991 and A203 on receiver 100042. The change in pour lot numbering format was made in early 1997. M1A serial number 102570 with a marking of J10698-014. M1A serial number 106XXX had an underside marking of J11085/19 and M1A serial number 1107XX was marked 12778-02 on the underside. M1A serial number 173898 was marked 16143-08 on the underside of the receiver. The pour lot number is an identifying mark for the casting supplier. Later, the marking Springfield Inc Geneseo IL was added to the bottom of the receiver under the operating rod rail as observed on M1A serial number 191974.

Valley Ordnance Co. had re-welded over 50,000 destroyed M1 Garand receivers when the owner, Melvin Smith, determined that there was a viable market for a civilian version of the M14 rifle. He visited Springfield Armory before it closed in April 1968. He befriended some of the workers who identified what machine tools would be useful for manufacture of commercial M14 rifles. As a result, Mr. Smith bid upon and won an elevation serration machine and a lathe at the Springfield Armory equipment auction.

Melvin Smith also contacted Winchester to inquire about the machine it had used to make the receiver barrel threads but he was informed that most of its M14 machine tools were going to be sold. Melvin Smith purchased nearly fifty tons of M1 and M14 project machine tools, tooling, fixtures and inspection equipment at government auction so that he could produce civilian M14 receivers and parts. Most of this equipment had been used by Winchester in its M14 rifle production. Valley Ordnance made operation of the fixtures on the machine tools as simple as possible. This minimized the risk of machining errors. Some of the machinery and operations are described as follows:

1. Operating rod channel machine - This was a single spindle mill. Valley Ordnance employees made cutting tools for this machine.

2. Brown & Sharpe spline mill - This 1936 machine was highly sophisticated for its time. It was used in M1 Garand production at Winchester. This was a single spindle mill used to cut the bolt raceway inside the receiver.

3. Circular cut end mill - This machine was used to make the circular cut at the inside rear end of the receiver. A separate machine tool was used to cut the firing pin recess on the inside rear end of the receiver.

4. Elevation serration machine - A receiver was placed under a cutter (similar to a gear cutter) then rotated under the cutter to make the elevation knob serrations. This machine was bid upon and won at the Springfield Armory auction. It was one of eight elevation serration machines at Springfield Armory.

5. Beretta headspacing machine - Winchester did not include a receiver headspacing machine in the government auction of M14 project machine tools. Mr. Smith purchased a receiver headspacing machine from Beretta in Italy. The Beretta headspacing machine had been used in BM59 production. Valley Ordnance modified it for the M1A receiver. However, during Springfield Armory, Inc. production of its BM59 receivers, this machine was used to headspace the commercial BM59 receivers as a special assignment to Valley Ordnance. The operation of the headspacing machine is described as follows. The operator's left hand worked the cutting tool and the right hand ratcheted movement of the receiver by manipulating a fixture. Some timing was involved but the operator could easily hold within 0.001 " on the tolerance. The cutting tools were sharpened by the employees using a Bridgeport mill and a surface grinder. The headspace machine cutting tools were bought ten at a time from Cline Tool and Service Company (Newton, IA).

6. Rear sight pocket milling machine - This was a Bridgeport mill. It was used to machine the flat surface between the rear sight knobs and behind the cartridge clip guide.

7. Receiver scope mount groove milling machine - Another Bridgeport mill was used for this operation. Separate single pass cuts were made for the horizontal and vertical

grooves.

8. Receiver heel stamping machine - The receiver heel markings were made with a metal marking press using straight dies and a rolling fixture. This marking press was manually operated as purchased from the Winchester M14 project. At some point before early 1981, Valley Ordnance had modified it to operate pneumatically. Before then, Melvin Smith operated the metal marking press himself. The dies were obtained from Numberall Stamp & Tool Company, Inc. (Sangerville, ME). The receiver was held by the fixture and rolled on a radius while the pneumatically operated ram holding the die stamped the heel. The first die stamped U S RIFLE and 7.62-mm M1A for receivers just under serial number 0630XX or US RIFLE M1A for receivers over serial number 0630XX. The die was then changed so that the machine could stamp the brand name. Then the third die was installed in the machine to stamp the individual serial number. If the number stamping die trip dog switch counter did not trip, a duplicate number was created. Or on occasion, a Valley Ordnance worker would fail to reset the number stamping die properly. In either case, the letter A was hand stamped under the serial number. By doing so, the receiver was given a unique serial number and then did not have to be scrapped. This explains the letter A under receiver serial numbers 031000 and 032476 as well as others.

Once this equipment was set up in his shop, Melvin Smith designed improvements into the civilian version of the M14 receiver. These changes included increasing the thickness of the receiver bridge, changing the operating rod rail to better support the operating rod and prevent automatic fire, removal of small amounts of material for better clearance, and relocating the operating rod dismount notch. After some persuading by his friend, Edward M. "Ned" Hogan, Mr. Smith kept the receiver left side geometry the same as the USGI M14 even though it would add to the manufacturing cost.

Melvin Smith gave some thought to the name for the new commercial semi-automatic only M14 rifle. In the second half of 1969, Mr. Smith referred to the semi-automatic only commercial legal M14 type rifle as the M14C. At the time, M14 was considered by the BATF, then known as the ATFD, to be a machine gun. The model designation, M14, was flatly rejected by the BATF by no later than July 1970. Mr. Smith then considered naming the new commercial rifle, M15. The select fire rifle model name, M16, was not acceptable either for the same reason as M14.

In a letter from Edward M. "Ned" Hogan dated July 09, 1970, Melvin Smith was given the name for the new commercial M14 rifle. Mr. Hogan suggested M1*A* with an italicized letter A. Mr. Hogan reasoned that the civilian legal M14 type receiver should be known as the M1*A* because it was "legally derived from the present legally modified M1 receivers now marketed by you and Mr. Ballance rather than being derived from the illegal M14 or M15." Mr. Ballance agreed with the suggested name, M1A, but without the italicized letter A. Had Mr. Ballance not agreed to the model name M1A, Mr. Hogan had suggested model names M10 or M11. Mr. Hogan suggested M10 or M11 as alternate choices since the U. S. Army had never used those model numbers.

By no later than 1971 the Valley Ordnance M1A receiver design was approved as a Title I firearm under the 1968 Gun Control Act by the Department of the Treasury. Melvin Smith signed an exclusive contract with Elmer Ballance for Valley Ordnance to supply M1A finished receivers to Springfield Armory, Inc. These receivers were investment cast of certified AISI 8620 alloy steel. Up to as many as a dozen experimental M1A receivers were made before serial number 000001 was stamped. Serial numbers 000001 through 000010 were in the first casting lot and serial numbers 000011 through 000021 were in the second casting lot. At about serial number 000150, the length of the M1A receiver heel was changed slightly.

In 1972, Winchester did supply Valley Ordnance with Winchester marked hammer forged barrel blanks. Valley Ordnance intended to finish machine and install these barrels on match grade M1A rifles but it was not meant to be. Before Mr. Smith could complete the tool set-up, Mr. Ballance found a lot of over 1,000 USGI chromium plated barrels and so the USGI barrels were used instead. Additionally, another supplier had sold Mr. Ballance 180 USGI M14 NM barrels in late 1972 and early 1973.

When Springfield Armory, Inc. had USGI M14 chromium plated barrels, its workers would often gage the chambers and group them into lots dimensionally. Based on the findings, it had Valley Ordnance cut the M1A receiver headspace to better fit the USGI M14 chromium plated barrels in its inventory. As an example, Springfield Armory, Inc. would request Valley Ordnance make 100 M1A receivers headspaced to – 0.003 " from blueprint zero. Thus, match grade and some standard model receivers have a number on the bottom surface. The numbers will range from 1 to 5. The numeral 1 means the receiver is headspace to 0.001 " longer than blueprint zero. If the receiver is marked with the number - 4 this means the receiver is headspaced to 0.004 " shorter than blueprint zero. This manufacturing practice resulted in improved accuracy because of the tighter headspace.

In January 1972, Valley Ordnance Co. performed sixty-three machining steps for each M1A receiver. Earlier receivers machined by Valley Ordnance Co. were given a lot of hand grinding and polishing by Melvin Smith. Specifically, these areas were: 1) the exterior heel corners on the sides 2) the flat surface aft of the operating rod channel 3) the top surface of the left receiver wall from the cartridge clip guide to the barrel ring 4) the vertical surface on the right side behind the cartridge clip guide all the way back including the windage knob ear 5) the left side of the barrel ring forward of the horizontal scope mount groove 6) the magazine well aft of the feed lips and 7) the top surface of the barrel ring after all machining operations that located off the barrel ring had been done. This cosmetic detailing is evident as late as M1A serial number 062857 but was no longer being done by serial number 064922. Note that the hand polishing served to enhance the aesthetic appearance but did not add to the functional ability of the M1A receiver. As Melvin Smith moved to semi-retirement the receiver surfaces noted above were finished by machine. For example, the magazine well on M1A receivers was cut and broached by machine tool after Mr. Smith purchased Hillside Manufacturing.

The Missing Connector Lock Hole - The USGI drawing F7790189 indicates that there shall be a hole for the connector lock pin on both sides of the receiver. This allows a stuck connector lock to be pushed out if need be. The connector lock hole on the left side of the receiver was drilled in at least the first eleven M1A receivers but it is not present in M1A receiver serial number 000049. The left side connector lock hole is still missing in M1A receiver serial number 002010 but the hole reappears by serial number 00209X. The connector lock hole was temporarily omitted to reduce the manufacturing cost by $1.00.

The receiver heels were stamped and numbered by Valley Ordnance Co. with the exception of custom serial numbers. Custom serial numbers were available through Springfield Armory, Inc. in the 1980s. Valley Ordnance shipped custom serial number receivers to Geneseo, IL without a receiver heel serial number. However, to comply with BATF regulations, Valley Ordnance identified each of these receivers before shipping by stamping the letters VO followed by a unique sequentially issued number that was recorded like all other serial numbers at Valley Ordnance. The VO series numbers were first placed on the side of the receiver legs on earlier receivers, then on the bottom side of the receiver on the flat behind the legs on later production custom serial number receivers.

Before Melvin Smith's involvement with the M1A, Hillside Manufacturing (Dallas, PA) was a subcontractor to Valley Ordnance for portions of its manufacture of the Eagle Arms 9 mm and .45 ACP Carbines. The two companies manufactured and assembled the carbines from scratch. Mr. Smith's design for the bolt assembly used in the Eagle Arms carbines was patented in 1968. In the 1970s, Valley Ordnance was a distributor of Fox Wasp .45 ACP carbines made by Tri-C Corporation (Meriden, CT).

When Melvin Smith contracted with Elmer Ballance for the M1A, Hillside Manufacturing became a subcontractor to Valley Ordnance for that project. Melvin Smith bought Hillside Manufacturing (Dallas, PA) upon retirement of the original owner, William Croughn, in about 1990. Dallas, PA is about ten miles from Wilkes-Barre, PA. Prior to the change in ownership, Hillside Manufacturing was a subcontractor to Valley Ordnance for M1A receivers and parts but also made parts for companies like Piper Aircraft and Mack Truck. Hillside Manufacturing did the rough machining work on the M1A castings from before 1976 until 1996. After the change in ownership, Hillside Manufacturing was almost 100 % dedicated to M1A receiver production due to high market demand. The Valley Ordnance scope of business remained this way until Melvin Smith passed away.

During the entire time Valley Ordnance was in operation, there were no CNC machine tools in its facility. All of the machine tools were single operation units and were set up and operated manually. Valley Ordnance always did the finish machining on the receivers. Valley Ordnance also did some development work on the Springfield Armory, Inc. M1 Garand receivers before 1987 but no production was done.

Since Hillside Manufacturing did not have a Federal Firearms License (FFL), it was limited in the amount of machining that it could perform on the raw castings. Otherwise, the BATF would have considered Hillside Manufacturing to be a manufacturer of rifle receivers, which are regulated the same as completed firearms. Hillside Manufacturing did machine the receiver heel surface, windage knob detents and ball detent hemispheres, and bored and threaded the barrel ring. The receiver heel surface had to be precisely machined and tolerances held closely in order to produce consistent heel stampings at Valley Ordnance. In the early 1990s, Hillside Manufacturing bought and installed three Moog Hydrapoint Model 83-3000 CNC machining centers for M1A receiver work. Before then, it used Moog Hydrapoint NC tape operated machining centers.

Hillside Manufacturing and Valley Ordnance worked together on an experimental project in 1991 to machine two M1A receivers from AISI 8620 alloy steel billet. This was done solely as a study to see if machining from billet was economically competitive with investment casting. The rough machining was done at Hillside Manufacturing and the finish machining was performed at Valley Ordnance. Disposition of these two receivers is unknown.

M1A Receiver Production Flow – A combined total of seventy different machining operations were performed by Hillside Manufacturing and Valley Ordnance for each M1A receiver. Both companies used quality control procedures after each machining operation. For operations that were cosmetic in nature, one out of every ten receivers was checked dimensionally. For critical operations, e.g., receiver threads, every single receiver was checked for dimensional tolerance. The manufacturing cycle time for the M1A receiver at Hillside Manufacturing in 1976 was 1 hour 50 minutes. By 1996, the cycle time at Hillside Manufacturing had been reduced to 45 minutes by use of CNC machining methods. The following describes the production flow for receivers during the period of 1981 to 1996:

1. Casting – Gray-Syracuse pours the castings using certified AISI 8620 alloy steel. The raw castings and material certification paperwork are shipped to Hillside Manufacturing.

2. Rough machining – Hillside Manufacturing performs rough machining of the M1A receiver. The semi-finished receivers and certification paperwork are shipped to Valley Ordnance.

3. Finish machining and inspection – Samples of semi-finished receivers are pulled and sent to Springfield Armory, Inc. for the heat treating vendor. Valley Ordnance performs the finish machining work and dimensional inspection of the remaining receivers. The finished receivers and copies of the certification paperwork are shipped to Springfield

Armory, Inc. in Geneseo, IL.

4. Inspection and additional machining – Springfield Armory, Inc. inspects the finished receivers supplied by Valley Ordnance. Receivers that do not meet its standard are sent back to Valley Ordnance for destruction and recycling at Gray-Syracuse, Inc. Receivers that pass inspection are shipped to a heat treating vendor in the Chicago, IL area. If the receiver is to get a custom serial number, the heel is stamped prior to heat treatment. If the receiver is to be made select fire or lugged, this work is completed prior to heat treatment.

5. Heat treatment – The vendor performs the heat treatment procedure using the previously submitted semi-finished receiver samples from Valley Ordnance. The finish-machined receivers are then heat treated and shipped back to Geneseo, IL.

6. Coating, assembly, test fire and customer shipping – The M1A receivers are returned to Springfield Armory, Inc. from the heat treating vendor. The receivers are phosphate coated. The receivers, stocks and other parts are assembled into complete rifles and test fired on site. Similar to what existed at TRW, the test firing facility was a water backstop. If the rifle malfunctions during test firing, it is rebuilt and retested. The rifles are boxed with a magazine, factory headspace tag, M14 manual, and sales literature. M1A rifles are then shipped to firearms distributors for delivery to individual FFL holders.

Every M1A receiver was given a final inspection at Valley Ordnance as part of the quality control program. The finished M1A receiver was placed on a magnetic base and compared using a Starrett dial indicator to a Winchester M14 receiver or custom made gage blocks surface ground and hardened to the USGI receiver blueprint dimensions. The Winchester receiver used for quality control purposes was cut off just behind the rear sight pocket. A less-than-80 % finished TRW receiver was used to check dimensional quality of the receiver heel rear end machining cuts. Every M1A receiver had a bolt inserted into it by hand to check for proper function before leaving Valley Ordnance. Springfield Armory, Inc. also performed inspection of finished M1A receivers. Any receiver deemed to have any machining errors, even minor cosmetic flaws, was sent back to Valley Ordnance for destruction. These less-than-perfect receivers, as many as 100 at a time, were destroyed by sledge hammer at Valley Ordnance then shipped back to Gray-Syracuse, Inc. for recycling back into raw castings. At Valley Ordnance, there were no “factory seconds” M1A receivers. M1A receivers are of good quality. Springfield Armory, Inc. has never used Chinese M14 parts in the assembly of its M1A rifles.

The Starrett dial indicator and custom gage blocks were transferred to Springfield Armory, Inc. in 1996 along with the machine tools from Hillside Manufacturing and Valley Ordnance. Comparison of select fire M1A serial number 030061 to close up photographs of several USGI Winchester M14 receivers reveals similar machining cuts on all surfaces.

The busiest year for Valley Ordnance was 1994. This was the year the federal Assault Weapons Ban was passed and enacted. Valley Ordnance employees worked seventy to seventy-five hours to meet orders for M1A receivers. M1A receiver serial number 076539 was shipped to Springfield Armory, Inc. on January 07, 1994. Receiver serial number 088207 was shipped from Valley Ordnance to Geneseo, IL on December 30, 1994. Average weekly production was approximately 100 M1A receivers through Hillside Manufacturing and Valley Ordnance between 1976 and 1996. However, there were weeks where Hillside Manufacturing and Valley Ordnance produced 300 M1A receivers a week in 1994 but quality control was always held to the same high standard. The second busiest year for the firm was 1990. During lean times Melvin Smith found creative ways to keep cash flowing in and his employees busy. For example, in 1985 and 1986 Valley Ordnance designed, manufactured and marketed a fish scaler. Mr. Smith's design was patented in 1988. The fish scaler was cast at Gray-Syracuse, Inc. and machined by Valley Ordnance Co. This 7.3 ounce kitchen utensil was made of a single piece of 1704 stainless steel and was backed with a twenty year warranty against wear or breakage when used only for scaling fish.

Later on, Mr. Smith fell very ill and was hospitalized. He sold Valley Ordnance to Springfield Armory, Inc. He treated all of his employees very well. In response, he was loved by his employees. Mr. Smith was a U. S. Army veteran and had served in post-World War II Italy. At his funeral, his employees coordinated with the local VFW Post to give him a twenty-one rifle volley using M1A rifles owned by Mr. Smith and the employees.

The last complete finished M1A receiver made at Valley Ordnance Co., serial number 097726 (zero nine seven seven two six), was shipped to Springfield Armory, Inc. on May 16, 1996. Operations were shut down and the production equipment was shipped to Springfield Armory, Inc. in Geneseo, IL on July 22, 1996. Employees from Valley Ordnance and Hillside Manufacturing went to Geneseo, IL to assist in setting up the newly acquired machine tools. This was a very thorough transition taking between four to six weeks which included instruction by the Hillside Manufacturing and Valley Ordnance personnel on all machining operations. Springfield Armory, Inc. graciously offered positions to the employees from Valley Ordnance and Hillside Manufacturing with competitive wages as part of the transition. As of 2003, the M1A receivers were still machined at Springfield Armory, Inc. in Geneseo, IL in the same manner as was performed at Hillside Manufacturing and Valley Ordnance.

In late 1974 and early 1975, Springfield Armory, Inc. had difficulty obtaining a dependable supply of USGI M14 and M14 NM barrels. Thus, Bob Reese contracted with Numrich Arms (West Hurley, NY) to manufacture 300 match grade six groove 1:10 twist AISI 4140 alloy steel barrels. Springfield Armory, Inc. advertised these barrels in the February 01, 1975 issue of *Shotgun News.*

In 1976, Springfield Armory, Inc. was purchasing M14 parts from Sherwood Distributors, Inc., Numrich Arms, and Sarco, Inc. Sherwood Distributors, Inc. (1994 address 18714 Parthenia Street Northridge, CA 91324) was owned by Michael D. Kokin. It was a firearms parts and accessories business from April 1969 until 1994. Mr. Kokin sold his company and the new owner, Bernard Hartog, established Northridge International, Inc. (San Fernando, CA) in July 1994. In the mid-1970s, Numrich Arms was owned and operated by George R. Numrich, Jr. Mr. Numrich passed away in 1991. Operations at Numrich Arms were then managed by Ira Trast. Mr. Trast had been with Numrich since at least the mid-1970s. When Mr. Trast retired about 2000, Mr. Numrich's son took the reins. Today, Numrich Arms Corporation and Sarco, Inc. remain very busy supplying firearms parts and accessories for the commercial market.

Hillside Manufacturing produced finished barrels from Wilson Arms supplied blanks from about 1978 until some time before 1990. Only Wilson Arms barrel blanks were used at Hillside Manufacturing. The 1.100 " diameter barrel blanks had the rifling done but otherwise all other machining was performed by Hillside Manufacturing. This included cutting the external contour, cutting off the breech, cutting the feed ramps, chambering, drilling the gas port, grinding the operating rod guide, gas cylinder and flash suppressor lobes, cutting the gas cylinder and flash suppressor splines, threading the chamber end to mate with the receiver, and threading the muzzle end for the flash suppressor nut. The same machine was used to cut the barrel threads and the receiver barrel ring threads. It was a Planomill thread milling machine. This was the same type of machine tool that was used for U. S. government production of the M1 Garand and M14 receivers and barrels. Springfield Armory, Inc. bought the barrel making operation including all of the associated machine tools. Before 1990, Springfield Armory, Inc. also made non-plated barrels for the M1A.

The 22 " long barrels were made in three grades, standard contour, standard contour National Match, and heavyweight National Match. None of the barrels manufactured at Hillside Manufacturing were chromium plated. A notable exception was a single run of a couple hundred M1A-A1 Bush 18 " non-plated barrels made around 1980 or 1981. The rack grade standard contour barrels were supplied to Springfield Armory, Inc. during times when USGI chromium plated M14 barrels were not available. The dimensional tolerances were incredibly tight on the barrels. For example, the diameter of the gas cylinder lobes was held to within 0.0005 ".

The barrel crowning was done by hand. The barrels were lined up by the hundreds on a bench. Melvin Smith then used his steady hand and eagle eye with a portable electric tool and ball stone to machine the crown on each barrel muzzle moving from one end of the bench to the other. The barrels were not stamped GENESEO IL at Hillside Manufacturing. This was done at Springfield Armory, Inc. Some of the machine tools used in the barrel operation by Hillside Manufacturing and transferred to Springfield Armory, Inc. in 1996 are described as follows:

1. German made hydraulically operated tracer lathe – This lathe cut the external contour in one pass.

2. Cincinnati rise and fall horizontal mill – This mill cut the gas cylinder splines.

3. Ward turret lathe – This mill was used to machine the chamber to desired specification.

4. Landis cylindrical grinder – This grinder was used to obtain the final dimension of the operating rod and gas cylinder lobes after turning on the lathe.

By no later than 1978, Hillside Manufacturing machined reproduction operating rods, trigger housings, flash suppressors, bolts, operating rod spring guides and barrels. No gas cylinders were made by Hillside Manufacturing or Valley Ordnance. It has not been confirmed but most likely the trigger housing and flash suppressor castings for M1A parts were also produced by Gray-Syracuse, Inc. since Mr. Smith was loyal to his suppliers. Valley Ordnance did the finish machining on cast semi-finished cartridge clip guides supplied to the firm. The reproduction bolts, operating rods and trigger housings were stamped at Valley Ordnance. The operating rod spring guides were made from plate steel using a punch press with progressive dies. The operating rods were supplied to Hillside Manufacturing already welded together. Hillside Manufacturing machined the operating rods to final dimension. In the late 1980s, Hillside Manufacturing made fewer M1A parts as Springfield Armory, Inc. found other sources or did the work itself.

**Springfield Armory, Inc. and Glenn Nelson**

Glenn Eugene Nelson joined the U. S. Army in 1954 and became a member of its shooting team in 1961. He earned Distinguished Rifleman status in 1962. He remained on the Army shooting team until late 1965 when he accepted an offer to become a match armorer. He completed the U. S. Army match armorer school at Rock Island Arsenal then began building M14 rifles for competition as part of the USAMTU at Fort Benning. He was trained at the USAMTU by Sergeant "Hook" Boutin. Mr. Nelson went on to serve in Viet Nam and the Non-Commissioned Officer-In-Charge of the AMU Custom Gun Shop. Master Sergeant Nelson retired from the U. S. Army in 1975. As soon as Reese Surplus, Inc. purchased Springfield Armory, Inc. in 1974, Bob Reese hired Glenn Nelson to establish a shop that could build competition grade M1A rifles.

Mr. Nelson began building Ultra Match M1 Garand and National Match and Super Match M1A rifles from his home. However, by 1987 the business had grown such that Nelson's Custom Gun Shop occupied 5,000 square feet of building space. Over the years he put together a first rate staff of former AMTU match armorers and former Army team shooters. Mr. Nelson and his staff kept up with and implemented the latest accurizing techniques used by the AMTU as time went on. Mr. Nelson built competition rifles for Springfield Armory, Inc. until 2004. Mr. Nelson's FFL Book had logged over 41,200 entries for rifles received for his gifted touch. When Mr. Nelson retired from business, his machine tools and shop equipment were sold to Chief Warrant Officer 3 Ken Corcoran, U. S. Army (Retired) of North Pole, AK. Chief Warrant Officer Corcoran was an AMU armorer himself.

The custom Super Match M1A rifles were fitted with either Douglas or Hart heavyweight barrels. These heavyweight barrels were available in 1:10, 1:11, or 1:12 twist rates. Mr. Nelson required the air-gauged and stress-relieved barrel blanks supplied to him have a bore diameter between 0.2999 " and 0.3004 " and a groove diameter between 0.3079 " and 0.3084 ". The heavyweight barrel blanks were supplied with rifling obviously, but the rest of the machining was done by Mr. Nelson or his employees. National Match medium weight barrels were supplied by Springfield Armory, Inc. to Mr. Nelson already for installation by other suppliers. The operating rod guides were soldered on to the barrels. For individual customers, Mr. Nelson machined hand picked medium weight and heavyweight Douglas Premium barrel blanks and installed them in rifle builds unless the customer specified otherwise.

To give the reader an idea of what is possible with the M14 rifle and a talented armorer, the following will illustrate the point. In April 1986, Glenn Nelson built a Super Match M1A rifle from stripped receiver serial number 033187. The build included all TRW parts and a National Match rear sight. After final assembly, this rifle was tested on a machine rest. It grouped fourteen shots under the size of a nickel at 200 yards with 168 grain Sierra bullets. The test target was presented to the buyer, a member of the Second Army Shooting Team.

Mr. Nelson and his staff used the same Springfield Armory, Inc. M1A receivers used on standard models to create state-of-the-art competition rifles. They performed the match conditioning work and 90 % of the assembly on the receivers sent to the Nelson shop in Columbus, GA by Springfield Armory, Inc. Mr. Nelson purchased TRW bolts for building all the National Match and Super Match M1A rifles in his shop. Headspace on these rifles was kept between 1.631 " and 1.632 ". The M1A rifles dressed in wood stocks were coated several times with raw linseed oil. The almost-complete rifles were shipped back to Springfield Armory, Inc. for final assembly, test firing, packaging and shipping. Final assembly in Geneseo, IL included installation of the front and rear sights, operating rods, hand guards and slings. Mr. Nelson passed away on February 17, 2007 after battling several types of cancer.

**Rock Island Armory, Inc.**

Rock Island Armory, Inc. was established in March 1977. David Reese was President of the company. One of its first products was newly manufactured M1 Carbine receivers. By 1985, it was located at 111 Exchange Street Geneseo, IL 61254. Rock Island Armory was a sister company of Springfield Armory, Inc. It mostly performed work for foreign military customers. However, Rock Island Armory did perform thirty-five select fire conversions on semi-automatic Springfield Armory, Inc. M1A rifles. These conversions were stamped with the letters R I A on top of the receiver heel on the flat surface just to the rear of the rear sight base. This company had no connection with the U. S. government Rock Island Arsenal also located in Illinois. Rock Island Armory, Inc. was in business until August 1997.

**Karl Maunz**

Karl Maunz began shooting competitively at the age of nine. He started shooting at the Camp Perry matches at fifteen years old. He loved the sport so much that he joined the U. S. Army at the age of seventeen and was an armorer (Military Occupational Specialty was 762.10) at eighteen. He was in active service from 1957 until 1964 in the Army Reserve. He was a member of the U. S. Army shooting team from 1960 through 1964. Lacy DeGrange, a member of the U. S. Army shooting team from 1958 to 1960, helped Karl Maunz build his first M1 Garand rifle. During the early 1960s, members of the U. S. Army Reserve were only allowed to possess a M14 rifle while at Camp Perry. Unquestionably, this put them at a competitive disadvantage with Regular Army competition shooters. So, Karl Maunz ground two M1 Garand receiver halves and Melvin Smith welded them back together with a shorter overall length to replicate most of an M14 receiver's dimensions. Mr. Maunz and Mr. Smith met while at Camp Perry in 1961. While he was on the Army shooting team, Mr. Maunz would practice with this M1 Garand rifle converted to accept an M14 magazine. This is the first known 7.62 x 51 mm caliber magazine fed M1 Garand rifle. At the same time, others had ground out and machined whole M1 Garand receivers to accept M14 magazines. Disclaimer: This must not be done unless one has the proper knowledge, training, equipment and licensing to do so. Metal working operations alter the mechanical properties of steel and can compromise the strength of the finished product.

Mr. Maunz went on to shoot Distinguished Rifleman using the M1 Garand rifle shooting left-handed. He received much encouragement from Colonel Joe Smith, Director of the DCM in pursuing this achievement. In 1965, Karl Maunz scored higher than all shooters using bolt action rifles at the National Matches. He received his Lifetime Master designation from the NRA Competitions Division in 1966. The DCM belatedly awarded Karl Maunz his Distinguished Rifleman award in 1971. In 1972, he was disqualified as a civilian competitor at Camp Perry because he attempted to shoot with a Springfield Armory, Inc. M1A rifle. The National Rifle Association later changed the High Power Rifle match rules to allow civilian competitors to use the M14 type rifle. Mr. Maunz shot competitively in the years 1960 through 1973, 1978 through 1981 and from 1984 through 1989.

Karl Maunz converted M1 Garand rifles in the 1960s to accept M14 magazines and installed 7.62 x 51 mm / .308 Winchester barrels on them. This conversion was known as the Maunz Model 57 Rifle. Around 1967 and 1968, Rimer Casting Company (Waterville, OH) produced Maunz Model 67 castings for Karl Maunz. The receiver castings were subsequently machined. The Model 67 receiver was a lengthened M1 Garand receiver with a BM59 style bolt lock but it accepted a M14 magazine. The Model 67 receivers were assembled into complete rifles. There were 400 to 500 Model 67 rifles built. The calibers were .308 Winchester or .308 case with .264 bullet. The Model 67 rifle was still available from Mr. Maunz until 1987. Mr. Maunz got his idea for naming his rifle designs, Models 57, 67, 77 and 87, from the legendary German rifle manufacturer, Mauser.

In the late 1960s and early 1970s he owned and operated Competitive Shooters Supply Company in Defiance, OH and another gun shop in Napoleon, OH. In the early 1970s, Karl Maunz built M14 type rifles using Springfield Armory, Inc. M1A receivers. He later owned American Kit Car Company and a General Motors automobile dealership. He sold a 1970 Cadillac automobile to Melvin Smith in 1971. Later, in 1977, Karl Maunz sold him a 1973 model Cadillac. At one time, Mr. Maunz owned a restaurant in northern Florida. In 2005, he owned and operated a beverage company and a vineyard.

Maunz M14 Rifle Synthetic Stocks - In 1967, Karl Maunz designed a prototype commercial M14 fiberglass stock and sent it to Reinhart Fajen, Inc. Reinhart Fajen, Inc. made a wood M14 stock from this prototype. Mr. Maunz enhanced his original design in a drawing done at Cincinnati, OH dated April 10, 1977. He specified lightweight synthetic resin foam material to fill the butt stock in these satin black color heavy contour fiberglass stocks beginning in 1977 to enhance hearing protection for the shooter. The Maunz M14 synthetic stock could be reinforced with ballistic resistant material in 1986 for an additional $25.00. The Maunz M14 rifle stocks were available from 1977 until about 1989. The first of the Maunz M14 synthetic stocks was installed in 1977 on Springfield Armory, Inc. M1A serial number 000011.

Mr. Maunz sent a wood copy of his 1977 design fiberglass M14 stock to Reinhart Fajen, Inc. about 1978 or 1979. He also traded one of his April 1977 design fiberglass M14 stocks to Gale McMillan around 1985. That same year, Karl Maunz drew up the design for a red, white and blue M1A rifle stock to be sold through the American Shooters Union. Reinhart Fajen, Inc. manufactured this red, white and blue wood laminate stock in 1985 for Karl Maunz. This stock was reportedly featured in the 1985 Edition of the *Shooter's Bible*.

Maunz Receiver Master Die – Karl Maunz drew up the semi-automatic M14 receiver master die using a copy of USGI M14 receiver drawing F7790189 in the winter of 1969. A machinist at Rimer Casting Company (then at its address in Waterville, OH prior to Rimer Road Waterville, OH) reviewed it for Mr. Maunz. Mr. Maunz then gave the modified M14 receiver drawing to a tool and die maker in Holland, Ohio. Fabrication of the receiver master die was delayed due to a lack of funds until late 1970. The receiver master die took six months to fabricate. Finally, the receiver master die was completed some time before August 1971. The stamped serial number of the master die is 71-1761-183. The master die was designed to produce a casting with an open barrel ring. It was found that this caused porosity at the front end of the casting. Consequently, the die was modified on April 05, 1972 by adding an insert that allowed the pour to fill the barrel ring in the casting. Between 1971 and 1987, this receiver master die was used to birth all of the M14 type receiver castings for A. R. Sales Co., Maunz Mfg., Maunz Match Rifle, H&R Gun Co., and Smith Ltd. and some castings for Armscorp of America. For example, in a purchase order dated June 22, 1987 and signed by Jack Friese, Armscorp of America requested delivery of 1,000 semi-automatic M14 type receivers from Karl Maunz.

Maunz Manufacturing, Inc. – Karl Maunz established Maunz Manufacturing, Inc. in 1977 while he lived in Cincinnati, OH. Maunz Manufacturing first used Springfield Armory, Inc. (Valley Ordnance Co. manufactured) M1A receivers to build complete M14 type rifles. Very quickly though, under the license and supervision of Karl Maunz, his associates cast, machined and stamped Maunz Mfg. receivers. The Maunz Mfg. receivers were cast at Rimer Casting Company. Rimer Casting Company was located on Rimer Road in Waterville, OH from 1970 until June 1997. The owner, Richard Rimer, sold the business and retired in June 1997.

Most of the Maunz named M14 type rifles were stamped Maunz Mfg. The Maunz Mfg. rifles were built between 1976 and 1978 and from 1983 to 1984. From 1983 to 1987, Karl Maunz had M14 parts shipped to and rifles assembled and tested at 3230 Strayer Road Maumee, OH 43537. Maunz Mfg. M14 type rifles were all built with USGI M1 and M14 and National Match grade parts. A very few Maunz Mfg. rifles were experimental models. These rifles have a serial number preceded by EX-. One of the EX- series rifles has been observed without the scope mount hole. Some Maunz Mfg. and Maunz Match Rifle receivers were stamped TOLEDO, OHIO on the scope mount (left) side. Karl Maunz only sold Maunz Mfg. rifles to corporations. Maunz Manufacturing ceased operations in 1987.

Maunz Match Rifle - The Maunz Match Rifle receivers were cast at Funkfein Casting (Columbus, OH). The Maunz Match Rifle receivers were machined by Smith Manufacturing Co. per an agreement with Karl Maunz. Maunz Match Rifle models were all built with USGI and National Match grade parts. The match grade barrels were obtained from Karl Walther, Boots J. Obermeyer, and John Krieger and barrel blanks from Bob Hart. Obermeyer barrels were only used on a few Maunz Match Rifle models though. The original stocks on these rifles have a Maunz Match Rifles badge embedded in the stock. This 1 ½ " x 2 " badge includes an eagle, crossed Union and Confederate flags and the words In God We Trust against a white color background. All Maunz Match Rifle models were sold originally as complete rifles by Smith Manufacturing Co. and not by Karl Maunz. One Maunz Match Rifle was marked B.P.DOW 0001 in two lines on the receiver heel.

Mr. Maunz only built Maunz Match Rifle models for match shooters who had earned an NRA Master or higher classification. Mr. Maunz built his last Maunz Match Rifle Model 77 for a Master shooter in 1987. One such competitor was the late retired USMC Chief Warrant Officer 4 David I. "D.I." Boyd, II. CWO4 Boyd was the finest American competition shooter ever. He won several team and individual gold medals in various World Championships, Championships of the Americas matches and Pan American

Games from 1963 to 1977. He earned at least four National Championship titles from 1972 to 1981 and was the USMC Rifle Champion in 1975. CWO4 Boyd was featured on the October 1981 issue front cover of *American Rifleman*, the year he won the National High Power Rifle Championship. He was a Triple Distinguished Shooter by earning the United States Distinguished International Shooter Badge, the USMC Distinguished Rifleman Badge, and the USMC Distinguished Pistol Shot Badge. CWO4 Boyd's Maunz Match Rifle serial number was USMC 1. CWO4 Boyd retired from the U. S. Marine Corps in 1998 and passed away in May 2000.

All Maunz Mfg. and Maunz Match Rifle receivers were first examined by X-ray and then by magnetic particle inspection before phosphate coating. These receivers were stamped with a number in the rear sight pocket as part of the quality control program. Maunz Match Rifle serial numbers 0002 and 0041 are stamped on the receiver heel from top to bottom: first line – MAUNZ second line – MATCH RIFLE third line - MODEL 77 fourth line – 00XX.

The Maunz Match Rifle Model 77 was designed in 1977 by Karl Maunz but not produced until 1985. It was available from 1985 to 1987 in 7.62 x 51 mm / .308 Winchester with either 22 " long medium weight or heavyweight match barrels. The synthetic stock was a satin black color finish. The Model 77 rifle was supplied with a removable globe style front sight that could be swapped out with the National Match 0.062 " front sight on the USGI flash suppressor. The rear sight was the National Match hooded aperture model. Fifty of the Maunz Match Rifles were produced in 1985 with ASU series serial numbers. Thirty of these rifles had the 1977 Maunz design satin black color fiberglass stocks. The remaining twenty rifles were fitted with the 1985 Maunz design red, white and blue wood laminate stocks.

The Maunz Match Rifle Model 87 was designed in 1987 by Mr. Maunz. It housed all of the gas system, including the gas cylinder, inside an oversized synthetic satin black color stock and had a 26 " medium weight barrel and a globe type front sight. The stock was available in either left-handed or right-handed models. The rear sight was the National Match hooded aperture model. The Maunz Match Rifle Model 87 was available from 1987 to 1989 in several calibers.

Mr. Maunz did not favor welding a lug onto the M14 type receiver. Instead, he designed and marketed a bolt-on front receiver lug for the M14 type rifle. The Accuracy Lug attached to the receiver using a pin inserted through the connector lock holes and secured by a screw through the bottom of the stock. The Accuracy Lug was manufactured at Rimer Casting Company for Karl Maunz. It was part of the Model 77 build configuration. In 1986, it was available at Uncle Sam's and through Armscorp of America. Mr. Maunz designed a rear receiver lug in a December 18, 1984 drawing he made. A steel prototype was made and Rimer Casting Company was going to produce it but the project never moved forward.

**H & R Gun Co. and Smith Ltd.**

Mr. Maunz sold his M14 rifle business to Smith Manufacturing Co. (then P. O. Box 1070 Toledo, OH 43697) about 1984. The semi-automatic M14 receiver master die was loaned to them as part of the sale. Smith Manufacturing Co. produced complete rifles built on investment cast H&R Gun Co. stamped receivers. The H&R Gun Co. Semi-Auto 7.62MM-M14 receivers were marked TOLEDO, OHIO though Smith Manufacturing Co. was physically located in Holland, OH about fourteen miles to the west. H&R Gun Co. Semi-Auto 7.62MM-M14 rifles were assembled with Harrington & Richardson M14 parts kits imported in 1985 by Jack Friese. All H&R Gun Co. models were originally sold as complete rifles by Smith Manufacturing Co. Smith Manufacturing Co. was operated by Carl Hinkelman, Ron Smith of Tennessee (no relation to Ron Smith of Smith Enterprise, Inc. in Arizona) and another associate. As an aside, Carl Hinkelman lived in Toledo, OH within blocks of the Schuster family at the time. Karl Maunz was a consultant to Smith Manufacturing Co. on the H&R Gun Co. project.

Smith Manufacturing Co. machined the first Armscorp of America receivers around 1985 or 1986. A number of these had rear lugs made as part of the casting. The very first Armscorp of America M14 receiver was hand delivered to Mike Gruber by Karl Maunz. Smith Manufacturing Co. marked a few Armscorp of America receiver heels by electro-discharge machining (EDM) instead of using stamping dies as an experiment.

Smith Manufacturing Co. also produced Smith Ltd. investment cast semi-automatic M14 type receivers. Smith Ltd. receivers were made about 1987. Like Maunz Mfg., a very few Smith Ltd. rifles were experimental models. An example is Smith Ltd. M-14 serial number EX-5 which has a front lug and no rear lug. These rifles have a serial number preceded by EX-.

Smith Ltd. receivers were assembled as complete rifles and sold about 1987 and 1988 at Camp Perry shooting matches by Smith Manufacturing Co. Ron Smith, one of the principals of Smith Manufacturing Co., assembled the Smith Ltd. rifles at the family gun shop, Georgia Gun Trader, Inc. (then 605 West Nashville Street Ringgold, GA 30736). Ron Smith was a competitive shooter at Camp Perry in the 1980s. He learned how to build M14 type rifles through a couple of retired miltary armorers who lived in northern Georgia as well as from armorers and competitors he met at Camp Perry. The parts fit, if using USGI and/or National Match parts, is excellent, based on examination of Smith Ltd. rifles serial numbered 0210, 0225, 0236 and 0237. A commercial manufacture bolt and commercial manufacture operating rod were found to be too thick to slide smoothly inside Smith Ltd. receiver serial number 0237.

The following report was given by M14 gunsmith Tim Strait on March 14, 2006 on Smith Ltd. receiver serial number 0003 [minor spelling and punctuation errors corrected]:

Smith Ltd M14 # 0003

Receiver specifications as follows:

1. Excellent cast receiver with virtually no machine marks visible. Excellent parkerized [phosphate coated' metal finish on the entire rifle. Surface hardening was checked at the rear sight base with results of 59 HRC according to a local metallurgist.

2. All parts on this rifle are TRW (barrel, operating rod, firing mechanism and bolt). All parts seem to fit well without any fitting at all. Barrel gauges at 0 for throat erosion and 0 for muzzle wear.

3. Receiver threads (barrel) are correct per M14 military specification (barrel timing or indexing).

4. The machine work done on the inside of the receiver is excellent and smooth. No burrs were found on this receiver.

5. The locking lug helix of this Smith Ltd receiver matches the helix of the USGI M14 bolt very well at approximately 99.9 %.

6. Firing pin retraction was well within standard for USGI military specification.

7. Headspace on this rifle was set at a modest 1.6325 ". This is good enough for commercial .308 Winchester or 7.62 NATO ammunition. The bolt lugs have about 99 % contact with the receiver locking lug engagement area.

8. The receiver heel is just a bit thicker than other commercial receivers being made today.

9. The front pin hole for the bolt stop roll pin is cut exactly the same as USGI M14 rifles.

10. The operating rod dismount notch is 1 ½ times the width of current commercial receivers.

11. The receiver safety bridge was milled correctly and there's no bolt shuck or interference with bolt rotation. The action functions smoothly and without a hitch.

**Note**

During the 1980s, there were four businesses or individuals with the name of Smith involved with commercial M14 rifles as manufacturers. Neal Smith of Smith Firearms (Mentor, OH) performed NFA registered select fire conversions of already-manufactured Springfield Armory, Inc. M1A rifles. Richard Smith and Ron Smith of Smith Enterprise, Inc. (then Mesa, AZ) produced semi-automatic and select fire M14 rifles stamped SMITH

ENT. Melvin Smith of Valley Ordnance (Wilkes-Barre, PA) machined raw castings into M1A receivers for Springfield Armory, Inc. in Geneseo, IL. Smith Manufacturing Co. (Holland, OH) produced Maunz Match Rifle, H&R Gun Co. and Smith Ltd. semi-automatic M14 rifles and the first Armscorp of America M14 type receivers. Ron Smith of Tennessee was one of three stakeholders in Smith Manufacturing Co. He is of no relation to Ron Smith of Smith Enterprise, Inc. None of these entities ever did any work for the others. Although Armscorp of America, Inc. sold Smith Enterprise, Inc. M-14 receivers and Smith Manufacturing Co. made some Armscorp of America M14 receivers, there was never any connection or relationship between Smith Manufacturing Co. (Holland, OH) and Smith Enterprise, Inc. (then Mesa, AZ). Additionally, Frank Smith was the All National Guard MTU armorer in the 1980s and early 1990s. The similarity in names is purely coincidental.

**A. R. Sales Co., National Ordnance, Inc. and Federal Ordnance, Inc.**

In the 1960s, 1970s and 1980s, the Los Angeles area was the firearms manufacturing capitol of the western United States. Three southern California firms from that period were connected to the commercial M14 rifle, A. R. Sales Co., National Ordnance, Inc. and Federal Ordnance, Inc.

A. R. Sales Co. was established at 9624 Alpaca Street South El Monte, CA in 1968 by Ilia I. Karnes. Jack Karnes, his wife Ilia, and their two children ran the company. Mr. Karnes was a tool and die maker by trade. When the family business started, its first large contract was to make M16 scope mounts. The two letters, A.R., were taken from the first two alphanumeric characters of the commercial name for the M16 rifle. Next, A. R. Sales produced high-end lightweight alloy M1911 style pistol frames and accessories.

A. R. Sales Co. started on its semi-automatic M14 type rifle project by October 1971. An advertisement for its Mark IV rifle appeared in the October 15, 1971 issue of *Shotgun News.* The response from the civilian market was overwhelming. This included 2000 or more mail-in orders with the $15.00 deposit for a stripped Mark IV receiver.

A. R. Sales received its initial batch of Mark IV receiver castings by no later than March 07, 1972. This first set of receivers were used by Jack Karnes to set up fixtures and tooling for the machine tools. There were two Mark IV receiver production lots for the company. The first occurred in the winter of 1973. The first Mark IV rifles and stripped receivers were delivered to customers in January 1973. Mark IV serial number 0143 had been delivered to the buyer on March 02, 1973. The first production lot of Mark IV receivers was cast at Rimer Casting Company (Waterville, OH) using Karl Maunz's receiver master die according to two sources and at Prico (Los Angeles, CA) according to a third source, all highly reputable. The first production lot of Mark IV receivers was machined by A. R. Sales. The first lot of receiver serial numbers ended at a number less than 0226 with 200 receivers produced.

The second receiver production lot was made in 1976. The receiver serial numbers for the second lot were started at a number below 0226 and ended at number 0250. The second production batch of Mark IV receivers was cast at Gray-Syracuse, Inc. and machined by Valley Ordnance Co. About twenty-five receivers were produced in the second batch.

Twenty-five serial numbers were skipped between the first lot and the second lot. The missing serial numbers were allotted for tool room samples and for intended-but-never-realized forged receivers. Both production lots of Mark IV receivers were heat treated by a local company in southern California.

A. R. Sales Co. at first bought M14 parts brand new directly from USGI contractors. Mark IV rifles were assembled with new and used USGI M14 parts and USGI M14 wood stocks. Any used M14 parts that were broken or worn were compared to the USGI drawings and rejected in the build procedure. The stock selector cutout was filled in for each assembled Mark IV rifle. According to the October 1971 A. R. Sales Co. specification sheet for the Mark IV rifle, "While most of our rifles will be built with N.M. barrels, we do not glass bed the actions, nor do we produce match grade weapons. We feel that this is best left to those who specialize in accurizing and building match grade weapons, and we do not wish to infringe in their domain."

Ford Motor Company was formed on June 16, 1903 by Henry Ford and eleven other business associates. In 1925, Ford Motor Company bought Lincoln Motor Company, a manufacturer of luxury automobiles. For the 1972 model year, Lincoln introduced the Mark IV two-door luxury sport coupe. The Mark IV was longer, wider and slightly lighter than its very popular predecessor; the Lee Iacocca designed Lincoln Mark III. The 1972 Mark IV was Ford's answer to General Motors Corporation's Cadillac Eldorado and was a major success for Ford Motor Company. Lincoln Mark IV automobile production ended with the 1976 model year. Mr. Maunz was impressed with the plush style of the 1972 Lincoln Mark IV. Thus, he suggested to A. R. Sales that its semi-automatic M14 receiver be named Mark IV. A. R. Sales Mark IV receivers are of good quality.

Ilia Karnes sold the manufacturing side of A. R. Sales to Ranger Machine & Tool Corporation in November 1979. Ranger Machine & Tool continued to produce the pistol frames and accessories but did not produce any M14 receivers or rifles. Ranger Machine & Tool Corporation was purchased by Federal Ordnance, Inc. in May 1981. It occupied 9624 Alpaca Street from 1981 until 1984 when it merged with Federal Ordnance at 1443 Potrero Avenue. A. R. Sales moved in 1981 from 9624 Alpaca Street to 1900 Tyler Street in South El Monte. The retail business of A. R. Sales was shut down in 1984 by Ilia Karnes.

Golden State Arms (Pasadena, CA) was established in 1952 by Alvin Gettler. From 1960 onward, the firm was owned by Seymour Ziebert. It was a major importer of surplus firearms and ammunition. Golden State Arms went out of business in late 1966 along with two other related businesses, Pasadena Gun Shop and Pasadena Firearms, Inc. Jack Karnes, Burton "Bob" Brenner and Robert E. Penney were all former associates of Golden State Arms.

Bob Penney and John Arnold co-founded National Ordnance, Inc. and Alpine Sales in May 1960. National Ordnance manufactured M1 Carbine receivers and assembled carbines using surplus USGI parts. In 1962, this work was done at 235 S. Irwindale Avenue Azusa, CA. Alpine Sales was the sales half of the joint venture. In December 1962, the two gentlemen went their separate ways. Mr. Penney was left with Alpine Sales for the purpose of selling commercial M1 Carbines. He wanted to manufacture a commercial M14 receiver but in the early to mid-1960s there were no USGI M14 parts available in the surplus market. Mr. Arnold took over National Ordnance to concentrate on manufacturing M1903 and M1 Garand rifles. During their respective histories, Golden State Arms, National Ordnance and Federal Ordnance built semi-automatic BM59 rifles by welding together cut up BM59 receivers.

National Ordnance moved from Azusa, CA into the newly constructed building at 9643 Alpaca Street South El Monte, CA in 1965. From 1965 to 1970, National Ordnance produced 22,500 newly manufactured M1903A3 receivers and assembled them into complete rifles using USGI surplus parts. National Ordnance also manufactured 2000 M1 Garand welded and investment cast receivers. In the early 1960s, the firm manufactured an unknown number of M1 Carbine investment cast receivers for Alpine Sales. The newly manufactured M1 Carbine and M1 Garand receivers were cast by Rimer Casting Company. In the early 1970s, when A. R. Sales was developing its Mark IV receiver, John Arnold was pursuing the same goal of manufacturing and marketing his own semi-automatic M14 type receiver.

By 1973, John Arnold, a U. S. Navy World War II veteran, owned or partially owned at least three companies: National Ordnance, Inc., a firearm manufacturing company, Sporting Arms, Inc., a distributor of sporterized military rifles, and Cadmus Industries. National Ordnance, Inc. was established on May 06, 1960. The three companies were located on the same block of Alpaca Street. Mr. Wyant J. Lamont, Jr., managed the day-to-day operations of National Ordnance in the early 1970s.

Employees from both A. R. Sales and National Ordnance visited the facilities of one another to discuss set up of machine tools. A. R. Sales did assist National Ordnance in its BM59 project but there was no collaboration between the two firms specific to M14 type receivers. A very small number of National Ordnance stamped semi-automatic M14 type rifles were produced. Stephen Fuller reported two completed receivers for the company but a reliable source closer to the events of the time estimates a half-dozen National Ordnance receivers were finished. Electro Crisol Metal, S.A. (Santander, Cantabria, Spain) made the raw receiver castings for National Ordnance.

Mr. Arnold passed away from cancer on December 23, 1973. Walter Rayno, head foreman, and Jessica LaMont, wife of Wyant LaMont, were left to run the company. Shortly thereafter, National Ordnance was purchased by Bob Brenner. Mr. Rayno passed away suddenly on June 05, 1975 while enjoying the horse races at Santa Anita. Operations were moved to 9649 Alpaca Street in 1976 and appear to have ceased in South El Monte the following year. As part of the liquidation of the company's assets, assembled M14 type rifles and parts kits were sold off. The tooling and molds for the M1 Carbine receivers were sold to Rock Island Armory.

As soon as Golden State Arms had closed down and its assets auctioned off, Bob Brenner went into business for himself on November 16, 1966 as Federal Ordnance, Inc. Initially, he worked out of his home in Pasadena, CA. The company imported ammunition and U. S. and foreign made rifles and hand guns. By the late 1960s, Mr. Brenner's business was doing well and he became very good friends with John Arnold. Federal Ordnance moved in with National Ordnance at 9643 Alpaca Street. Federal Ordnance collaborated with National Ordnance to produce M1903 and M1 Carbines with commercial receivers and surplus USGI parts for sale to the public. In 1969, Federal Ordnance had outgrown its leased space and moved to the adjacent building, 9649 Alpaca Street South El Monte, CA.

In 1981, the business was moved due to further business growth from 9649 Alpaca Street to 1443 Potrero Avenue South El Monte, CA 91733. By no later than 1982, Jack Karnes went to work for Bob Brenner at Federal Ordnance as the chief machinist. He was employed by Federal Ordnance until 1984. Mr. Karnes then did consulting work for the company until 1985 or 1986. Robert Thomasser joined Federal Ordnance, Inc. in 1982 as a machinist. Later, he was promoted to Vice President. As Vice President, Mr. Thomasser managed the machine shop employees producing the Ranger M1911 style pistol and the Federal Ordnance M14 rifle. Other Federal Ordnance employees included Linda Thomasser and Bob Brenner's wife, Barbara, and son-in-law, Robert Siegal.

In early 1982, Federal Ordnance was finishing up its production of newly made M1 Garand and M1 Carbine receivers. Federal Ordnance, Inc. also manufactured the Model 713 Deluxe Mauser rifle (1986 - 1992) and the All American Sporter Bolt Action rifle (1991 - 1992). Federal Ordnance reached its peak of manufacturing activity around 1985 with about 120 employees. In the late 1980s at least, Federal Ordnance, Inc. supplied a list of firearms manufacturers and importers addresses with its factory literature and a note encouraging customers to contact the manufacturer or importer to get an owner's manual. Federal Ordnance sold lightweight alloy M1911 style pistol frames marketed under its name and a trade name as well as selling a Springfield Armory, Inc. high-end M1911 style pistol.

Federal Ordnance began production of its M14 type rifles by 1984 and ended in late 1991. Federal Ordnance was not able to compete with the price of imported Chinese M14 rifles so production was halted. After the first fifty, M14 receivers were machined on one CNC machining center with several fixture set ups. All receivers were machined from castings. Except for the first fifty receivers, the castings were supplied by Electro Crisol Metal, S.A. The M14 receivers were manufactured at a leased building one block up on Potrero Avenue. Heat treating was subcontracted to a vendor in El Monte, CA. Federal Ordnance M14 type receivers were heat treated and carburized according to USGI drawing F7790189. A company in Santa Ana, CA finished the receivers with a phosphate coating. Assembly of the Federal Ordnance M14 rifles was performed at a leased warehouse just west of 1443 Potrero Avenue. Each M14 was proof fired before assembly and function tested with three rounds as a complete rifle before packaging. Finished M14 rifles were stored on the first floor at 1443 Potrero Avenue. The total number of complete M14 rifles assembled by Federal Ordnance was more than 13,000. Based on information available, total M14 receiver production did not exceed 16,000.

The Manufacturer's Suggested Retail Price for a Federal Ordnance M14SA in 1988 was $629.00 and $700.00 in 1991. The rifles were sold with a one year parts and labor warranty. Each Federal Ordnance M14 type rifle sold was accompanied by a factory inspection tag, warranty registration card, a copy of U. S. Army FM 23-8 and a fourteen page booklet on firearms safety and care. The safety booklet was written by Federal Ordnance, Inc. in 1984. The factory inspection tag included the following information about each rifle: date, stock number, a description, caliber, and signature fields for checking of headspace, test firing and inspection. The stock number for the fiberglass stock M14 was GU-0715. USGI M14 accessories such as magazines, magazine pouches, slings and cleaning kits were available from Federal Ordnance.

Federal Ordnance built two types of M14 rifles, one with USGI parts and one with Chinese parts. USGI parts were used extensively in Federal Ordnance rifles through at least serial number 8877. The USGI parts were taken off USGI M14 rifles imported from Israel. By serial number 9337, if not earlier, Chinese and Taiwanese reproduction parts were used to assemble its rifles. For example, Federal Ordnance M14SA serial number 502XX was assembled at the factory on September 13, 1991 with Chinese manufacture bolt, operating rod, firing mechanism and barrel. Chinese and Taiwanese M14 parts were purchased from U. S. importers. Receivers with serial numbers above 60XXX have engraved heel markings. Four digit serial number Federal Ordnance receivers observed were marked on the side with the letter F inside a circle. This marking was sometimes lightly stamped. The circle F marking has not been observed on serial numbers above 10000. Federal Ordnance sold complete rifles as well as stripped receivers. Federal Ordnance sold a few M14 rifles to walk-in retail customers and through *Shotgun News* advertisements but most were sold to firearms distributors.

Some fiberglass stocks on Federal Ordnance M14 rifles appear to have been commercial manufacture of unknown origin. The original owner of Federal Ordnance M14SA serial number 22XX reported that the synthetic stock never had a selector cutout or USGI markings inside the magazine well. Further, the Federal Ordnance stock had a slightly rough finish. The butt plate was glossy black color instead of phosphate coated. Federal

Ordnance M14 rifles were also sold with refinished wood, new walnut and USGI synthetic stocks.

Century Arms International assembled a relatively small number of rifles using Federal Ordnance receivers and Chinese parts. This work was done at their facility in Montreal, Quebec, Canada in 1990 just before the imported parts ban of November 29, 1990. The rifles were brought into the United States with the military style features (twenty round magazine, bayonet lug, flash suppressor, and hinged butt plate) which was legal at the time and sold to the commercial market. These particular Federal Ordnance M14SA receivers have serial numbers with the letter C prefix followed by a hyphen then four digits, e.g., C-0116. The Federal Ordnance marking may be located on the outboard side of the right receiver leg. If so, it will be stamped: top line - Fed Ord Inc. bottom line - So El Monte. CA USA. The receiver heel for the serial number C-1301 was marked as follows: top line - U.S. RIFLE second line - 7.62MM M14S third line - CENTURY ARMS INC fourth line - ST. ALBANS. VT. fifth line - C-1301. Century Arms International ceased operations in Montreal around 1993.

Federal Ordnance, Inc. produced a limited number of Vietnam Commemorative M14 rifles for the American Historical Foundation. They were made to similar finish specifications as the Springfield Armory, Inc. VME series rifles but with three noticeable differences. The Federal Ordnance VCE series M14 had a black color textured surface wood stock and black hand guard. Federal Ordnance subcontracted the blueing, polishing, engraving and gold plating for the VCE series rifle parts. The VCE series stock was supplied through another vendor to the American Historical Foundation. The Springfield Armory, Inc. VME series rifles were made with a traditional finish walnut stock as previously discussed. The VCE series models had a non-plated flash suppressor with bayonet lug. The VME series rifles had gold plated lugless flash suppressors. Lastly, the receiver heels were stamped appropriately to the maker.

A separate venture, Briklee Trading Company was established on April 20, 1992 by Bob Brenner. It was headed by Richard Siegal. Briklee Trading bought the assets of Federal Ordnance in late 1992. Federal Ordnance, Inc. ceased to exist as a California corporation on July 09, 1993. Briklee Trading imported firearms until the 1998 import ban. Mr. Brenner then started Pacific Ordnance (Pico Rivera, CA), an import business specializing in reproduction military holsters and related accessories. Pacific Ordnance was incorporated in November 1998 with Robert and Linda Thomasser on board to help run the company. Mr. Brenner retired in early 2002. As a result, the Thomassers formed Pacific Canvas & Leather Company (Phelan, CA) in February 2002.

As an aside, Jack Karnes manufactured some 81 mm mortar round fin assemblies in 2002 for the Paramount Studios movie *We Were Soldiers.* These rugged fin assemblies were made to withstand the pressure generated by the mortar ignition charges which were designed to create 18 " flames out of the mortar tube. His son was one of the armorers assigned to the movie production unit. Regretfully, Mr. Karnes passed away on

May 27, 2008.

**Armscorp**

Production and Services – Armscorp of America, Inc. was formed in 1981 by Jack H. Friese. It built accurized M14 type rifles for competition shooters. In 1985, the company was located at 9162 Brookville Road Silver Spring, MD 20910. Mike Gruber and Clint McKee, who would later go on to establish Fulton Armory, also worked at Armscorp of America at this time. The company moved to 4424 John Avenue Baltimore, MD 21227 at some point between September 1987 and June 1989. About 1992, the other owner of Armscorp of America sold out his interest to Jack Friese. Mr. Friese then reorganized the firm as Armscorp USA, Inc. In late 2007, Mr. Friese sold the business to Mark Hartman, owner of James River Manufacturing. James River Manufacturing produced Armscorp logo M14 receivers from January until March 2008.

Smith Enterprise, Inc. sold some billet machined receivers to Armscorp of America, Inc. about 1985 and 1986 but none were stamped Armscorp of America. They were Smith Enterprise stamped receivers and advertised as such. A complete rifle with a Smith Enterprise receiver, all USGI parts and a used USGI stock was advertised by Armscorp of America initially in *Shotgun News* for $539.95. The Armscorp of America advertisement listed the bare Smith Enterprise M-14 receiver for sale at $199.95 and complete USGI parts kits without the receiver for $239.95. A TRW M14 parts kit was an additional $10.00. The customer demand for the bare receivers and assembled rifles was so great in 1986 that it took the firm until early 1988 to fill the backlog of orders even with a price increase. The June 1986 *Soldier of Fortune* review of the Armscorp of America M14 listed the retail price for the Armscorp of America M14 at $674.95 with a used USGI stock.

Armscorp of America, Inc. was machining investment cast receivers at some point by the summer of 1987 using castings supplied to them by Smith Manufacturing Co. (Holland, OH) through Karl Maunz. As of September 18, 1987, Armscorp of America had completed the machining of the first five lots of receiver castings using its own personnel and CNC machine tools. Armscorp of America receiver heat treatment was performed according to the USGI procedure and certified by the vendor. Smith Enterprise, Inc. sold some casting equipment and tooling to Armscorp of America, Inc. about 1988 or 1989. From that point, Armscorp of America made its own receiver castings.

Armscorp of America and Armscorp USA marketed several versions of semi-automatic M14 rifle through the years:

M14 - Service grade rifle assembled in 1991 and 1992 only with Chinese parts
M14 R - Service grade rifle assembled with USGI parts and USGI synthetic stock. This model was available from 1986 to 2006.
M14 RNS - Service grade rifle assembled with USGI parts and National Match walnut

stock.
M14 RNSB - Service grade rifle assembled with USGI parts and USGI birch stock.
M14 Beginning National Match - Match grade rifle assembled with hand fitted USGI parts and USGI National Match barrel from 1993 to 1996.
M14 NMR - Match grade rifle built to the USAMTU specifications with National Match sights and a choice of standard, medium weight or heavyweight barrels. This model was available from 1987 to 2006.
M21 - Match grade rifle with a rear lugged receiver and choice of McMillan fiberglass stock or a wood laminate stock. Rear lugged match grade rifles were available from Armscorp from 1986 to 2006.

Armscorp of America receiver with serial number A00326X has been identified as billet machined. However, most Armscorp brand receivers were machined from investment castings, e.g., serial number A0039XX. Armscorp USA, Inc. (later JRM / Armscorp) manufactures standard, rear lug and double lugged receivers. It was the first commercial manufacturer to sell factory new lugged receivers. From the start in February 2003 until May 2007, Armscorp USA made the castings and machined them into finished receivers for Fulton Armory according to its specifications. The firm poured castings and machined them into finished receivers for West Texas Armory. The West Texas Armory receiver serial numbers begin with the letters WTA. The first thirteen WTA prefix serial number M14 NM receivers were manufactured in July 2006. Dan O'Neal of West Texas Armory (Lubbock, TX) went into business as a Federal Firearms Licensee in April 2006.

A production run of Armscorp USA receivers was produced for the M-14 Firing Line online discussion board in 2007. The serial numbers assigned to this series were TFL001 through TFL250. The TFL series receivers are stamped with the M-14 Firing Line logo on the receiver heel. The serial number is stamped below the logo. Above the logo, the receiver is stamped: top line - U.S. RIFLE second line - 7.62 MM M14 NM. When James River Manufacturing became the owner of Armscorp in January 2008 there were about eighty serial numbers still left in this series to be assigned to receivers.

Armscorp heat treated its receivers to 56 to 58 HRC surface hardness with a case depth of 0.012 " to 0.018 " per the USGI receiver drawing. While it was in business, Armscorp provided M14 gunsmithing services such as rifle assembly, barrel installation, stock bedding, National Match trigger and flash suppressor modification, and clean and lube. Note that the large majority of Armscorp brand M14 type receivers have been sold by the manufacturer as stripped units. However, Armscorp did supply match grade rifles upon request. From 1984 to 1986, Bruce Dow built an average of four match grade rifles per month with Armscorp receivers for Armscorp to fill customer orders. In the 1980s, Armscorp of America manufactured and marketed a National Match operating rod spring guide. It was made of stainless steel and had a collar at the magazine catch for the end of the operating rod spring to rest against. For awhile some time after 1987, Armscorp of America also machined M14 barrels in-house from blanks. In mid-2006, Armscorp USA was investigating the possibility of manufacturing four forged M14 parts including the bolt.

At least one prototype M14 bolt was made. Unfortunately, this did not come to fruition.

Receiver Markings - Some of the Armscorp receivers were stamped M21 or XM25 instead of M14 NM or M14 to allow for sale in New Jersey, USA. The State of New Jersey, curiously, has banned new sales of some firearms by name rather than by operating characteristics or features. The markings 7790189 or 7790189 F have been observed on Armscorp receivers under the stock line on the right hand side. Armscorp USA receivers with The Firing Line serial numbers (TFL prefix followed by three digits) were made in 2007. James River Manufacturing managed the project of producing the last Armscorp marked receivers from January 01, 2008 until March 11, 2008. This included the last few TFL series receivers. The following is a partial list of TFL series receiver serial numbers that were delivered to the buyers: 001 through 081, 084, 085, 088, 089, 095, 097, 099 through 101, 105, 111, 113, 120 through 123, 130, 137, 158, 164, 171, 172, 176, 177, 193, 194, 222, 225, 226, 230, and 236.

Stampings on Armscorp receiver operating rod rails varied over its production history. There appears to have been seven operating rod rail markings:

1) Until at least serial number A003XXX, the Armscorp receivers were stamped SILVER SPRING MD on the vertical surface of the operating rod rail.

2) The operating rod rail stamping changed to ARMSCORP OF AMERICA SILVER SPRING MD by serial number A0035XX.

3) The third operating rod rail stamping was ARMSCORP OF AMERICA BALTIMORE MARYLAND. This information was stamped on a receiver with a serial number as low as A00398X.

4) By serial number A006037, the stamping had changed to ARMSCORP OF AMERICA BALTIMORE, MD. The city and state lettering was about half the height of the company name lettering.

5) Next came the operating rod rail marking ARMSCORP USA BALTIMORE MARYLAND by no later than receiver serial number 10451.

6) The sixth operating rod rail marking was ARMSCORP BALTIMORE MD as shown on receiver serial number 11XXX and 17371. The sixth marking was also used on WTA prefix serial number receivers. By serial number 17494 the operating rod rail and under-the-stock markings were applied by electropencil.

7) Beginning at receiver serial number 17605, the operating rod rail marking was changed to JRM / ARMSCORP BALTIMORE MD. This reflected the change in ownership of the Armscorp name.

Armscorp did issue custom receiver serial numbers. For example, Bruce Dow had six custom serial number Armscorp of America receivers made: BR DOW 001, MS DOW 001, SB DOW 001, JB DOW 001, NL DOW 001, and RB DOW 001. At least one Armscorp custom receiver serial number was preceded by the letter A. Armscorp of America M14 type receivers were given the letter A prefix about the same time (no later than February 1988) the CNC machine tool programming was changed for cutting the receiver bolt lug recesses. The serial number prefix S indicates the receiver was made of stainless steel instead of AISI 8620 alloy steel. At least twenty stainless steel receivers were produced by Armscorp USA in the mid to late 1990s.

**Fulton Armory**

Fulton Armory was established by Clint McKee in 1987 in Fulton, MD. The business was moved to its present location in Savage, MD several years later. Before starting Fulton Armory, Clint McKee worked with Jack Friese at what was then Armscorp of America.

Charles W. Maloney, former head armorer of the First U. S. Army Marksmanship Training Unit (Fort Meade, MD), was the chief gunsmith at Fulton Armory from about 1989 to 1997 when he retired. While working for the U. S. Army as a civilian armorer, Mr. Maloney provided instruction on M14 accurizing to 10$^{th}$ Special Forces Group sergeants Tom Kapp and Bill Amelung. As previously discussed, Kapp and Amelung would go on to develop the XM25. Among several firearms gunsmithing courses successfully completed, Mr. Maloney was a double honor graduate of the U. S. Army National Match Pistol and Rifle Maintenance Course (Rock Island Arsenal, IL).

Beginning in 2003, Fulton Armory began selling rifles and barreled actions with its own receivers. Fulton Armory receiver serial numbers begin with the letters FA. Receivers FA 00101 through 00110 were manufactured in the winter of 2003. Fulton Armory XM25 serial number FA 00500 is a rear lugged model. Fulton Armory M14 type rifle FA 00550 was assembled in August 2005. Fulton Armory receivers were investment cast from AISI 8620 alloy steel and machined by Armscorp USA. Armscorp made many changes to its tooling for production of Fulton Armory receivers. Armscorp also made significant improvements in receiver dimensional geometries as specifically requested by Fulton Armory. This included a wider than USGI specification operating rod rail. The Fulton Armory receiver was custom designed and uniquely manufactured. A sample Fulton Armory receiver heel was marked as follows from top to bottom: U. S. RIFLE 7.62 MM M14 FULTON ARMORY FA00106. The model number may be M14, M14 NM, M21 or XM25. The vertical surface of the operating rod rail was stamped SAVAGE, MD. Customers had a choice of standard or rear lugged receivers.

In 2006, Fulton Armory introduced its M14 Super Scout Rifle. This model was built using a Fulton Armory receiver, USGI M14 parts, a Super Scout rail hand guard, new manufacture military contour walnut stock, rubber recoil pad, and choice of non-plated or chromium plated 18.5 " or 22 " Fulton Armory barrel. The Super Scout rail hand guard was marked on the operating rod side: Super Scout Made in U.S.A. Fulton-Armory.com. The factory package included one ten round magazine, a rifle sling and owner's manual.

Options for the Fulton Armory M14 Super Scout Rifle included: 1) front sling swivel rail section 2) hand guard side rail 3) National Match trigger 4) National Match operating rod spring guide 5) Smith Enterprise, Inc. 7 " long steel M14 scope mount 6) Fulton Armory non-operable replica selector switch 7) muzzle brake for California compliant models. Each side rail was secured to the rail hand guard by two hex head screws.

Fulton Armory offers a host of M14 type rifle gunsmithing services. Its services include technical inspection, clean and lube, barrel installation and headspacing, phosphate coating of parts, firing mechanism tuning, complete rifle assembly, and match conditioning. Fulton Armory has installed USGI bolts and barrels on hundreds of Chinese M14 receivers. Thus, they offer conversion to USGI parts on Chinese M14 rifles as well.

**Western Ordnance International Corporation/Smith Enterprise, Inc.**

Western Ordnance International, which became Smith Enterprise, has designed and manufactured excellent quality firearm parts and built outstanding quality firearms for American and foreign governments and the civilian market. Its rifles and parts are too numerous to list in this work. For the sake of brevity, only its experience with the M14 type rifle will be discussed at length.

Ron Smith and Sonja Sommers own and operate Smith Enterprise, Inc. Smith Enterprise, Inc. is classified by the U. S. government as a veteran owned and operated contractor. Its CAGE Code is 3A5E1. Ron Smith served in the U. S. Marines and carried a Harrington & Richardson M14 rifle in the Republic of Viet Nam in 1968. He shot competitively for the Arizona Army National Guard and California Army National Guard and is a 1986 graduate of the Israeli Defense Force Sniper School. Ron Smith is a fourth generation career professional in the ordnance industry. He has been licensed as a Class 2 SOT/FFL since 1984. He apprenticed under his dad, Richard Smith, and was actively involved in all projects undertaken. This included, but was not limited to, research, development and production of its M14 receivers and the M14K, research and development of Poly Technologies M14 rifles, making parts for the M16 type rifle, and select fire conversions on Browning Hi-Power 9 mm pistols before the May 1986 ban. When Richard Smith retired in 1992, he passed the torch to his son, Ron. From no later than 1994 until at least 1997, the company was known as Smith Arms International. The firm relocated from 325 South Westwood # 1 Mesa, AZ 85210 to the present facility in Tempe, AZ between March 1994 and July 1996. In 1995, Richard Smith went back to work at Western Ordnance working for his son, Ron Smith.

In 1987, Creedmoor Armory (Oceanside, CA) was the first distributor of billet machined Smith Enterprise, Inc. M-14 receivers. Jim Hill purchased twenty Smith Enterprise, Inc. billet machined receivers. These receivers had serial numbers in the single and double digits. Creedmoor Armory was established in 1979 to make shooting jackets and firearms accessories available to the competitive shooter. The owner, James Hill, is a retired U. S. Marine, National Champion, 1960 Olympic Silver Medalist and Triple Distinguished Shooter. About 1990, Mr. Hill sold Creedmoor Armory to two gentlemen who renamed the business Creedmoor Sports. Mr. Hill moved to Illinois. He was the National Matches Highpower Match Director at Camp Perry from 1992 to 2007. In the 1980s, Smith Enterprise manufactured twenty to thirty M-14 NM rifles for Creedmoor Armory. Smith Enterprise, Inc. did all of the barrel machining as well on these rifles using Obermeyer, Douglas and Krieger rifled barrel blanks. Mo DeFina (Mo's Competitor Supply) also purchased twenty of the billet machined receivers with serial numbers below 00100.

Oceanside, CA was also home for many years to M14 competition shooter and gunsmith Art Luppino. Mr. Luppino served in the U. S. Marine Corps during the Korean War. He built many M14 rifles for competition shooting in his gunsmithing career including the U. S. Navy Rifle Team at Moffett Field (Mountain View, CA). In the early 1970s, he designed and made M14 rifle chamber and gas piston cleaning tools, a gas cylinder lock wrench and a muzzle crown guide. These tools were distributed through Creedmoor Sports. Mr. Luppino bought several of the billet machined Smith Enterprise, Inc. receivers with serial numbers under 00100, built them into match rifles and sold them to various individuals.

In January and May 1983, Mr. Luppino rebuilt ten double lugged match conditioned Springfield Armory, Inc. M1A rifles for the U. S. Navy SEALs. The M1A rifles had been shipped from and were later returned to SEAL Team Six at Naval Amphibious Base, Little Creek (postal address is in Norfolk, VA). The invoice for this work was paid many months later by check drawn on the U. S. Treasury. This lot of M1A rifles had originally been lugged and match conditioned by another gunsmith. The Navy SEALs were not satisfied with the work done and the accuracy performance. Some of these rifles would not even function. Thus, Mr. Luppino was sent the rifles for rebuild. The serial numbers of the M1A rifles sent to Mr. Luppino were: 018736, 022066, 022074, 022079, 022114, 022131, 022852, 022853, 023219, and 023677. SEAL Team Six was created in October 1980 and was mission-capable by April 1981. It is responsible for counterterrorist operations conducted by the U. S. Navy. In 1987, SEAL Team Six was renamed to Naval Special Warfare Development Group.

Art Luppino was the armorer of instruction in both Lenny Magill Productions *Center X* video tapes on M14 rifle accuracy. The first video, made in 1992, covered cleaning and lubrication of the M14 type rifle. The second video was a tutorial on glass bedding of the M14. By the mid-1990s, Mr. Luppino had moved to Tucson, AZ where he continued to build accurized M14 type rifles. By 2006, he had moved to Texas and retired.

Without question, Smith Enterprise has much more knowledge of and experience with testing and working on Chinese M14 type rifles than anyone outside the People's Republic of China. Smith Enterprise is a Leupold & Stevens, Inc. optics factory authorized distributor to government and law enforcement agencies as well as a Sage International M14 EBR stock authorized distributor. Among countless customer requests fulfilled, Ron Smith surveyed the Jordan government M14 rifle inventory at the request of King Abdullah II in 1999. In late 2004, the government of Jordan had requested further assistance from Ron Smith on its M14 rifle program.

**Smith Enterprise, Inc. Receiver Design, Manufacture and Testing**

All Smith Enterprise receivers have been manufactured from certified AISI 8620 alloy steel. About 1985, Smith Enterprise began producing M14 receivers after several months of planning and evaluation. This included creating its blueprints and engineering sketches. Smith Enterprise M14 receivers incorporated a number of innovative features that improve upon the USGI design. The receiver locking lugs were adjusted forward to reduce the headspace about 0.003 " to 0.005 ". The receiver bridge was adjusted a little aft (to the rear) to retract the firing pin faster in order to better prevent slam fire. The receiver barrel ring thread starting quadrant was changed to reduce barrel torque to about 50 ft-lbf which is sufficient. Typically, Smith Enterprise M14 rifles were headspaced at 1.633 ".

At least forty receivers under serial number 00100 were machined from billet but Smith Enterprise, Inc. made its first receivers by the precision investment casting method. The raw castings left a large amount of metal that had to be machined away to obtain the final form. All Smith Enterprise investment cast receivers have been made with virgin bar stock AISI 8620 alloy steel certified by the supplier and verified by Smith Enterprise. The Smith Enterprise “forged” billet machined receivers were made from fine grade Hart AISI 8620 alloy steel certified by the supplier and verified by Smith Enterprise. Manufacturing of receivers starting with billet allowed even more control over the receiver form. Billet was plasma cut into the starting shape.

All heat treatment of all Smith Enterprise receivers has been certified by the vendor and verified by Smith Enterprise. All of its receivers have been examined by magnetic particle inspection and some were X-rayed. All receiver barrel ring threads were inspected using a USGI thread timing gauge. Post-heat treat receiver surface and core hardness was examined by spectrum analysis using test mounts (receiver specimens) every 100 rounds fired for a time then every 200 rounds for awhile and then randomly after that. The specimens for the test mounts were cut at various points on the receivers. These test mounts show the case depth of Smith Enterprise receivers is 0.012 " to 0.015 " and the core hardness to range from 35 to 40 HRC in accordance with the USGI M14 receiver drawing F7790189. Smith Enterprise also required spectrum analysis of the receiver when its heat treat vendor changed personnel. Such testing and resultant analysis led to a standard operating procedure for heat treatment. All of this inspection and non-destructive examination was part of the Smith Enterprise, Inc. quality control program.

Note that the reader MUST NOT perform the testing described herein. Personal injury or death may result. Ron Smith personally test fired the very first receiver without it having been heat treated. He shot it for twenty rounds to prove the integrity of the material. The headspace had set back 0.010 " by the twentieth round. Smith Enterprise had Thunderbird Cartridge Company (Laveen, AZ) make up two hand load lots of proof test ammunition for them. One batch of proof test rounds was loaded to 65,000 psi and the other was loaded to 76,000 psi. Thunderbird Cartridge used nickel plated Federal cases and M118 bullets. The bottoms of the 76,000 psi cases were colored purple for identification. Next, a second receiver with no heat treatment was shot twice with 65,000 psi proof test rounds. The headspace had set back 0.010 ". After this, ten receivers were selected out of the first lot of 100 finished receivers. Each of these ten receivers was fired with one round of 65,000 psi proof test ammunition.

Then one finished receiver was selected for destructive testing. Scott Medesha was a witness to this destructive testing. First, ten rounds of 65,000 psi proof test ammunition were fired. Next, 76,000 psi proof test rounds were fired. After four rounds of 76,000 psi proof test ammunition, there were some signs of problems but the receiver had not failed. The cases were seizing in the chamber. Therefore, Scott Medesha went home and loaded up one round of ammunition. Ron Smith states this cartridge was loaded with a large charge of Hercules (now Alliant Techsystems) Unique pistol powder and a 175 grain bullet. Taking suitable precautions, the destruction cartridge was loaded into the rifle chamber and fired. Scott Medesha achieved the desired result. The receiver failed with a dull, muffled boom. The cartridge case vaporized, the barrel blew out about two feet in front of the stock, and the bottom forward one inch of the bolt blew apart, the magazine blew out of the action and all magazine spot welds gave out. The back of the receiver gently rolled off to one side. The receiver on both sides behind the locking lugs cracked. However, the locking lugs on the receiver and the bolt held! The M14 enthusiast should not turn his nose up at a well-made investment cast receiver.

There is a pronounced difference in the shape of the receiver heel between the Smith Enterprise (and Armscorp of America) billet machined and Smith Enterprise investment cast receivers. The billet machined receivers have almost square heel corners whereas the investment cast receiver heel corners are rounded. Smith Enterprise machined more than 300 semi-automatic M14 receivers from plasma cut plate steel. These receivers were marked FORGED USA because the company believed it was a simple, but not exaggerated, way to state the receiver quality. Smith Enterprise semi-automatic M14 receivers were finished with a phosphate coating until somewhere around serial number 002000. From that point forward, pre-'94 ban receivers had nitrocarburizing treatment which left a black color finish. Investment cast receivers above serial number 002000 had additional finish machining that made them nearly indistinguishable from the billet machined receivers. Post-'94 ban receivers left the factory with a phosphate coating. In the opinion of M14 gunsmith Ted Brown, this particular lot of pre-'94 ban receivers were the best investment cast M14 receivers ever made and the billet machined receivers were the best ever. The post-'94 ban receivers were investment cast and produced in small lots of ten to fifteen at a time.

Smith Enterprise also made a single batch of billet machined select fire receivers before the May 19, 1986 civilian machine gun ban. These select fire receivers were registered under the National Firearms Act and then sold in late 1985 to a Class 3 Special Occupational Tax Federal Firearms Licensee in Oregon. All select fire Smith Enterprise models were machined from billet but lack the FORGED USA marking.

**Smith Enterprise, Inc. Receiver Identification**

Examination of several rifles reveals distinctive markings on Smith Enterprise receivers. Smith Enterprise did stamp some receivers with customer requested serial numbers. Examples of these are serial numbers of the owner's initials and birth date or USGI M14 serial numbers issued to the customer during military service. Some Smith Enterprise receiver heels used serif style lettering such as serial numbers 002197 and 002198 but others do not, e.g., 002292. The number 1 was added to the beginning of some receiver serial numbers to correct the few instances of duplicate numbers. Note that 7790189 is the USGI drawing number for the M14 receiver. Smith Enterprise, Inc. receivers have features as described below:

Pre-'86 ban billet machined select fire - 1) center and rear operating rod dismount notches 2) no hole drilled in the right side receiver leg 3) the selector lug is a homogeneous portion of the receiver rather than welded on 4) M-14 on the heel 5) serial number starts with the letters FA followed by five digits 6) MESA, AZ on the vertical surface at the forward end of the operating rod rail 7) 7790189 on the right hand side near the connector lock with no other marking below the stock line or 90189 and an eagle, arrow, and stars cartouche below the stock line on the right hand side near the connector lock.

Pre-'94 ban billet machined semi-automatic - 1) M-14 or M-14 NM on the heel 2) MESA, AZ on the vertical surface of the operating rod rail at the forward end 3) FORGED USA on the vertical surface of the operating rod rail at the rear end 4) 7790189 below the stock line on the right hand side near the connector lock 5) ordnance eagle and three stars symbol below the stock line on the right hand side near the connector lock.

Pre-'94 ban precision investment cast semi-automatic - 1) M-14 NM on the heel 2) MESA, AZ on the vertical surface of the operating rod rail at the forward end 3) 7790189 below the stock line on the right hand side near the connector lock.

Post-'94 ban precision investment cast semi-automatic - 1) M-14 NM on the heel 2) serial number is a four digit number beginning with the numeral 5 3) TEMPE, AZ on the vertical surface of the operating rod rail at the forward end.

**Smith Enterprise, Inc. M14 Services**

Smith Enterprise, Inc. offers a host of services for the M14 type rifle. It has performed gunsmithing work for many years and continues to do so for the U. S. Army, U. S. Marine Corps and federal government agencies. Smith Enterprise M14 services include match tuning, assembly, receiver heat treatment, receiver, barrel or complete rifle cryogenic treatment, Chinese rifle bolt conversion to USGI bolt, bush barrel conversion and gas piston heat treatment and hard chromium plating. The Chinese rifle bolt conversion entails reworking the receiver to accept a USGI bolt and headspacing the barrel. Smith Enterprise has offered this service since 1994. The bush barrel conversion included finish reaming, installing and headspacing a 17 5/8 " air gauged medium weight Douglas match grade barrel to the receiver. The 17 5/8 " match grade barrel was available from Smith Enterprise, Inc. as late as 2003.

Smith Enterprise will also install its AISI 8620 alloy steel rear or rear and front lugs to the receiver upon customer request. Its rear lugs are designed with beveled edges and an innovative three degree release angle on all four sides. This design reduces wear on the precision bedding material during routine maintenance. In 1986, some of the U. S. Marine Corps shooting team match conditioned M14 rifles were suffering from weld failure on one side of the receiver rear lug. It was determined that improper selection of welding rod material was the cause. Consequently, the U. S. Marine Corps shooting team adopted the practices of Smith Enterprise, Inc. for installation of M14 receiver lugs. Smith Enterprise, Inc. installs receiver lugs on LRB Arms M14SA and M25 receivers for LRB of Long Island, Inc. That work is identified by the stamping S.E.I. on the bottom of the rear lug.

The company also offers a repair for worn or soft receiver elevation serrations. The repair job involves two steps. First, a special cutter is used to slightly counterbore the serrations on the receiver. Then, a serrated hardened steel disk is silver soldered in place of the original serrated area making the elevation knob move once again in crisp six degree movements (sixty serrations in a circular pattern). Beginning in July 2005, Smith Enterprise, Inc. conducted maintenance training classes for U. S. active duty military personnel on the Mk 14 Mod 0 and Mk 14 SEI systems. The first class consisted of twelve U. S. Air Force pararescue airmen.

**M14K**

Smith Enterprise, Inc. and LaFrance Specialties (San Diego, CA) have collaborated on various projects through the years. One such venture was the M14K, a very interesting and innovative development of the M14 type rifle. The origin was a desire on the part of Richard Smith and Tim LaFrance in the 1980s to make the M14 more compact and controllable without generating excessive muzzle blast and recoil. Tim LaFrance, Richard Smith and his son, Ron Smith, did the research and development for the M14K. After some experimentation, they found that the M60 machine gun gas system provided great promise in reducing the cyclic rate and in delaying bolt opening. Muzzle blast and felt recoil was softened as well. So, Ron Smith further improved and perfected the M60 type gas system for the M14K. M14K rifles, semi-automatic and select fire, were built by Smith Enterprise, Inc. and LaFrance Specialties. This included the woodworking necessary for the stocks. Stanley C. Crist fired the prototype M14K carbine and wrote an article on it that appeared in *S.W.A.T.* The M14K was marketed through means such as a Smith Enterprise, Inc. sales brochure printed and an advertisement that appeared in an October 1988 issue of *Shotgun News*. Additionally, the M14K was marketed by Tim LaFrance at the 1988 *Soldier of Fortune* Show. The last production run was in 1990.

The conversion to a M14K consists of installing the improved M60 type gas system, adding a unique combination muzzle brake and flash hider, shortening the operating rod and wood stock fore end and installing National Match front and rear sights. The fore end of the wood stock was shortened to accommodate the new gas system. A side folding pistol grip wood stock was optional for the M14K. The M14K barrel length was 13 ½ ". M14K models purchased by civilians had either 1:10 twist four groove medium weight match barrels or 1:12 twist chromium plated barrels. The semi-automatic only M14K rifles were assembled with a permanently attached muzzle attachment to bring the barrel length to 16.25 " (overall rifle length of 34.5 "). This modification then exempted the semi-auto only M14K from registration as a Short Barrel Rifle under the National Firearms Act. The match grade barrels proved to be markedly more accurate than the chromium plated barrels in the M14K. The M14K cyclic rate was about 600 rounds per minute and the muzzle velocity 2560 feet per second using M80 ball ammunition. The M14K weighed 9.5 pounds without a magazine or sling.

During the Reagan Presidency, Smith Enterprise converted some M14 rifles to M14K carbines for the Colombian government. The M14K was very effective in the hands of the Colombian Army. In fact, it was so effective that the drug cartel FARC threatened bodily harm on the Smith family. Because the Reagan Administration was not able to guarantee around the clock protection, Smith Enterprise decided to cease the conversion work for the Colombian government.

Smith Enterprise, Inc. introduced an improved M14K at the January 2007 SHOT Show in Orlando, FL. The gas system had been redesigned for ease of manufacturing. Boyds' will supply the wood stocks using tooling and patterns owned by Smith Enterprise, Inc. Sage International, Ltd. was the supplier for M14 EBR style stocks specifically for the M14K. The improved M14K carbines will have Wilson Arms 16 " four groove barrels with 1:10 twist for semi-automatic models and 1:12 twist for NFA registered select fire models. Semi-automatic only M14K rifles will require registration as short-barrel rifles under the National Firearms Act. Smith Enterprise, Inc. will make all the gas system components. The M14K rear sight assembly will include a non-hooded National Match aperture. A turnaround time of two weeks will be the goal for completing each conversion.

**AWC Systems Technology**

AWC Systems Technology owner Lynn McWilliams and Gale McMillan, founder of McMillan Fiberglass Stocks, created the G2 series bullpup M14. From 1991 to late 1994, AWC Systems Technology (Phoenix, AZ) converted some M14 type rifles into a bullpup rifle design. Three models of the Gale McMillan inspired design were made, G2, G2A and G2FA. The G2 was the first version. It had a standard contour barrel and a scope mount. The G2A featured a Krieger heavyweight barrel, modified gas cylinder and a scope mount redesigned by Lynn McWilliams. The G2FA was the select fire model.

The overall length for the G2 model was 33.25 ". G2 series rifles were outfitted with a special McMillan design muzzle brake. The trigger was moved forward of the magazine well. The operating rod was modified so that the operating rod handle was located at the mid-point of the barrel. The G2 series design changed the trigger to be actuated by a cable that ran through a channel inside the stock to a bellcrank acting against the original trigger.

All three G2 models placed the scope directly over the barrel. This was accomplished one of two ways. The early design scope mount consisted of two columns on which scope rings were mounted. The late version scope mount was a rail bridge. The rail bridge was fitted around the gas cylinder and gas cylinder lock at the front end and a column clamped to the barrel mid-point for the rear. The G2 variants were capable of 0.5 MOA accuracy using match grade ammunition. The Gale McMillan designed G2 series stock had three sling attachment points, one on each side of the butt stock and one of the left side of the forearm. McMillan Fiberglass Stocks sold four stocks to AWC Systems Technology but the source for the remaining stocks is unknown.

AWC Systems Technology sold retrofit kits for $695.00 and converted existing M14 type rifles for $895.00. The 1994 manufacturer suggested retail price for a new complete G2A was $2,850.00. Reportedly, less than 100 G2 and G2A models and less than a dozen G2FA models were produced. At least one unit has been sound suppressed. Apart from AWC Systems Technology, Gale McMillan built one prototype bullpup G2FA for the Federal Bureau of Investigation. The sound suppressed and G2FA models must comply with the National Firearms Act of 1934.

**Hesse, Ltd. and Sarco, Inc.**

Hesse, Ltd. was located at 9487 Inver Grove Trail Inver Grove Heights, MN from 1998 to 2002. It made two batches of M14 receivers, the first in 2000 and the second in 2002. Steen Armament Research Co., Inc. doing business as Sarco, Inc. (Stirling, NJ) was established in the 1960s by Charlie Steen. It is one of the largest small arms parts dealers in the world. Sarco, Inc. has dealt in M14 parts since at least 1971. Sarco, Inc. M21 receivers were made in 2002. Sarco, Inc. receiver quality has been reported by owners as good fit and finish.

**Entreprise Arms, Inc.**

Entreprise Arms, Inc. (1996 address 16021 East Arrow Highway Unit B Irwindale, CA 91706) was established in 1993. The firm was located at 15861 Business Center Drive Irwindale, CA in 2000. From 2003 onward, it resides at 5321 Irwindale Avenue Irwindale, CA 91706. This manufacturer made one production run of 2000 receivers from 1996 to 1997. The last of the Entreprise Arms M14A2 receivers were sold in 2008. The receivers were CNC machined from twelve-pound billets of AISI 8620 alloy steel. The manufacturing process involved sixteen separate set up operations using three CNC machine tools. Entreprise Arms receivers were heat treated to a surface hardness of 52 to 56 HRC and a core hardness of 34 to 38 HRC. The receivers were given a black oxide finish rather than a phosphate coating.

The M14A2 receivers were sold with an unconditional lifetime guarantee. Some of the receivers have the stamping ABNI. ABNI is an abbreviation for ABN Industrial Co., Inc. (Buena Park, CA). ABN Industrial was a subcontractor to Entreprise Arms, Inc. ABN Industrial is a general machine shop, casting foundry, and sheet metal and fabrication assembler. Lower serial number Entreprise Arms M14A2 receivers have the serial number stamped on the left side near the rear sight. Higher serial number M14A2 receivers have a wider than USGI specification operating rod rail and the serial number was stamped on the receiver heel. By 2001, the firm had moved to its present address, 5321 Irwindale Avenue Irwindale, CA 91706. Entreprise Arms, Inc. provided M14 gunsmithing services in the late 1990s and early 2000s including rifle assembly, barrel installation, phosphate coating of parts, NM trigger modification, and clean and lube. Entreprise Arms, Inc. made an extended bolt lock for the M14 type rifle in the past but currently does not.

**Troy Industries, Inc.**

The M14 type rifle was further refined for civilians in 2002. Mike Rock and Jim Ribordy developed the Rock SOPMOD M14 for the U. S. Navy but the public is aware of it through the efforts of Stephen P. Troy at Troy Industries, Inc. RD Systems (South Beloit, IL) built the Rock SOPMOD M14 conversion. Troy Industries, Inc. (Lee, MA) marketed and sold the Rock SOPMOD M14 conversion until October 2005. LRB of Long Island, Inc. marketed the Rock SOPMOD M14 conversion from October 2005 until May 2006. RD Systems assumed the marketing duties from that point forward. What follows is a history of the Troy Industries involvement with the Rock SOPMOD M14 project.

Steve Troy was introduced to Mike Rock and the Rock SOPMOD M14 by a mutual business acquaintance. Steve Troy saw potential in the commercial market for the Rock SOPMOD M14. Consequently, Troy Industries promoted the Rock SOPMOD M14 through printed literature at the annual SHOT Show beginning in 2003, the company web site and Internet discussion boards.

As previously discussed, the Rock SOPMOD M14 carbine had been designed and developed under contract for the U. S Naval Surface Warfare Center (Crane, IN) for the M14 EBR project. At that time, neither Mike Rock nor Steve Troy knew of the involvement Sage International had with the M14 EBR project. Personnel from NSWC at Crane, IN informed them that the Rock SOPMOD M14 was still too heavy. Both Mr. Rock and Mr. Troy thought a contract was pending so they took steps to reduce the weight of the carbine. Ironically, the M14 EBR design adopted by the U. S. Navy weighs more than the commercial Rock SOPMOD M14 carbine.

The performance of the first commercial production conversions was puzzling since they were not performing as well as the models built for the U. S. Navy. Steve Troy made several trips to RD Systems to help troubleshoot the loss of accuracy. No further conversions were shipped and all those that had been shipped were returned to RD Systems at no expense to the customer. The loss of accuracy was mostly due to changes in materials used in the conversion to reduce weight to comply with the requirements of the unrealized U. S. Navy contract. Additionally, the varying dimensions of commercial M14 type receivers were responsible for complicating the installation of the receiver front lug that is bolted to the metal stock.

The original design of the Rock SOPMOD M14 featured an aluminum stock and steel telescoping rails. Steve Troy added his input to create the commercial version of the Rock SOPMOD M14. As a result, the Rock SOPMOD M14 was made with a lighter and stronger titanium butt stock assembly. The stock body was machined from alloy aluminum billet. Steve Troy made further design enhancements such as the operating rod protector, sling swivels, the three-way front lug, CQB combination flash suppressor / muzzle brake and textured coatings. The Rock SOPMOD M14 receiver was double lugged.

The pull button 16.5 " long 1:11.27 five radial groove rifle stainless steel barrels were supplied by Rock Creek Barrels, Inc. The new stock and accessory rail system included four military standard M1913 Picatinny accessory rails. The USGI flash suppressor and front sight were replaced with the combination flash suppressor and muzzle compensator compatible with the optional Troy Industries sound suppressor. A M203 grenade launcher will attach to the Rock SOPMOD M14 stock at the six o'clock rail. The grenade launcher could be removed by disengaging a quick release device.

The Rock SOPMOD M14 weighed less than 10 pounds and the overall length was 27 " with the stock collapsed. Using the Rock SOPMOD M14 and bipod, a twenty round magazine could be emptied into a 5 " group on paper at 100 yards in automatic. The Rock SOPMOD M14 could consistently group 3 " at 500 yards in semi-automatic. In either mode, felt recoil was negligible as compared to the standard M14 rifle.

In 2003, Troy Industries introduced the Rock SOPMOD M14 Calimando. This conversion was performed by RD Systems on California resident M14 type receivers to comply with that state's laws governing semiautomatic firearms. The conversion included a 16.5 " barrel and traditional style butt stock without a pistol grip. Overall length for the Rock SOPMOD M14 Calimando was 35 ".

Both Rock SOPMOD M14 Carbine and Calimando models used the cartridge clip guide as an attachment point for the accessory rails. The Rock SOPMOD M14 models had the visible portion of the operating rod marked with all the Troy Industries model information for those units sold by Troy Industries. Several optional items were available through Troy Industries for the Rock SOPMOD M14 models including single point CQB sling, soft or hard case, sound suppressor, and bipod. Standard surface finish for the stocks and pistol grips was textured black.

At the 2004 SHOT Show there were several Rock SOPMOD M14 carbines were displayed at the Troy Industries booth. One of these models was dressed in a medium brown color Rock SOPMOD M14 stock. The receiver, rear sight assembly, all rails, the firing mechanism parts, and the operating rod were all nickel-boron plated. The benefit of nickel-boron plating is wear resistance superior to that of chromium. The nickel-boron plated parts had a color darker than gold but lighter than bronze. That model was a special order item only available in 2003.

In 2004, several Springfield Armory, Inc. M1A SOCOM models were converted to ROCK SOPMOD M14 carbines. The original factory combination gas cylinder lock front sight muzzle brake was substituted with a re-threaded Noveski brand muzzle brake sans gas cylinder lock. Troy Industries sold a total of about thirty Rock SOPMOD M14 carbines. In October 2005, LRB of Long Island, Inc., began marketing the Rock SOPMOD M14. Another three Rock SOPMOD M14 units were sold. By September 2006, RD Systems had dropped the project.

**LRB of Long Island, Inc.**

In 2003, LRB of Long Island, Inc. began selling semi-automatic M14 type rifle receivers. LRB is an acronym for the names of the owner and his wife, Lou and Rosemarie Biancospino. The manufacturing of LRB Arms M14SA receivers is briefly described below.

Bourdon Forge Company has manufactured high quality forgings since 1969. It uses Computer Aided Design, Computer Aided Manufacturing and Computer Aided Design for Impact Forging software to develop highly specialized forgings. To make the LRB Arms receivers, Bourdon Forge Company, Inc. (Middletown, CT) cuts extruded AISI 8620 alloy steel bar stock into ingots, heats them and then drop forges them into shape. LRB of Long Island, Inc. designed its receiver forging die from a Winchester USGI M14 forging. The forging die design was slightly altered from the original to accommodate CNC machining operations. Bourdon Forge Company manufactured the LRB Arms M14 receiver forging die but LRB of Long Island retains ownership. Periodically, the die is replaced due to normal use.

The raw forgings are then machined at J. V. Precision Machine Company (Seymour, CT) according to USGI drawing F7790189. Dimensional tolerances are held to within 0.001 ". Most of the receiver dimension gages have been redesigned for compatibility with the CNC machining processes. Traditionally, the magazine well of commercial M14 receivers has been formed by broach cutting. J. V. Precision Machine Company, manufacturing semi-automatic M14 receivers for LRB Arms, in 2006 became the first ever to form the magazine well using the wire EDM method. In April 2007, J. V. Precision was using a wire EDM machine, a horizontal CNC machining center and two other machine tools in five tool set-ups to machine each LRB Arms M14 type receiver. Due to the complexity of the receiver design, some machining cuts still require manual machine tool operations such as drilling the bolt lock pin holes, final milling of the rear sight pocket and heel underside, cutting the receiver bridge primary firing pin retracting surface and cutting the receiver rear end firing pin recess.

The receivers are inspected at J. V. Precision for proper dimensional geometry and then examined again by LRB Arms itself back in Floral Park, NY. If inspection results are not satisfactory, the receivers are sent back to J. V. Precision for adjustment. If the receiver geometry is satisfactory, it is sent to a vendor for heat treatment. The first heat treating vendor was Beehive Heat Treating Service, Inc. (South Norwalk, CT) but the work was later moved to American Heat Treat, Inc. (Monroe, CT). LRB Arms receivers are heat treated to a core hardness of 28 to 42 HRC and a surface hardness of 52 to 55 HRC with a case depth of 0.012 " to 0.018 ". Each receiver is tested for hardness in the rear sight pocket since this surface is not visible once assembled as a complete rifle. LRB of Long Island, Inc. maintains a log book to record the hardness test results for every receiver. The final step is a phosphate coating that duplicates the color and finish of the original M14 receivers. Initially, the phosphate coating was performed by a metal coating company in St. Albans, VT. Presently, the receiver finishing is performed at Acton Metal Processing Corporation (Waltham, MA).

The LRB of Long Island, Inc. M14 type rifle receiver design was approved by the Bureau of Alcohol, Tobacco, Firearms and Explosives in January 2003. The law enforcement portion of the Bureau of Alcohol, Tobacco and Firearms was transferred from the Department of Treasury to the Department of Justice and renamed the Bureau of Alcohol, Tobacco, Firearms and Explosives (BATFE) on January 01, 2003 as part of the Homeland Security Act of 2002.

To understand the M14SA receiver numbering sequence the following background is given. In 2000, Mike Kelly Specialties (Grafton, WV), also known as MKS or M-K Specialties, removed the selector lug, filled in the operating rod rail cuts and welded back together at least 250 demilitarized USGI M14 receivers. The Bureau of Alcohol, Tobacco and Firearms apparently took issue with this market opportunity. In 2001 and 2002, the retail buyers of the MKS welded M14 rifles were tracked down by the BATF. All of the buyers had passed a criminal background check and bought the rifles through a Federal Firearms Dealer. Most of the owners "abandoned" the welded receivers but were able to keep the parts.

In 2006, the Sixth and Ninth Circuits of the United States Court of Appeals affirmed respective District Court rulings in 2002 granting U. S. government motions for seizure of welded MKS M14 receivers. Expert witnesses in both cases testified that the MKS manufactured M14 rifles could be made to fire automatically using metalworking tools in no more than two hours in one case and in no more than six hours in the other case. The phrase "readily restored" used in the National Firearms Act definition of machine gun (26 US Code section 5845 (b)) was not specifically defined in the federal statute. So, the courts turned to dictionaries for understanding of the words "readily" and "restored." Both circuit courts ruled that altering a MKS M14 receiver using metalworking tools within a period of two hours to six hours met the dictionary definitions of "readily" and "restored." Thus, the MKS receivers were judged to be machine guns per the NFA definition and the government had probable cause to seize the MKS M14 receivers since they were not found in the National Firearms Registration and Transfer Record.

In 2002, MKS was marketing the sale of newly manufactured semi-automatic receivers and complete rifles built on these receivers. Rifle models available were Rack Grade, Premier Match and Tanker. The Manufacturer's Suggested Retail price for the M-14-A1 Rack Grade rifle was $1595.00. The newly manufactured receivers were forged in Taiwan and machined at J. V. Precision Machine. LRB of Long Island was the distributor for the MKS newly manufactured M-14-A1 receivers. At least 100 of these newly manufactured receivers had made it into the hands of the buying public through Federal Firearms Dealers. As part of the purchasing process, all of the buyers successfully passed a criminal background check. These receivers were stamped on the heel as follows from top to bottom: first line – U.S. RIFLE second line – 7.62 MM M-14-A1 third line – MK SPECIALTIES fourth line – 00XXX.

As built, these receivers were only capable of semi-automatic fire and sold as such. However, the BATFE took the position that these receivers were unregistered machine guns. The presence of certain features discussed below was deemed by the BATFE to make these receivers readily convertible to automatic fire capable. These receivers were later confiscated in 2003 by the BATFE from the owners after being allowed to remove all other attached parts.

One day in 2002, a number of raw MKS receiver forgings were in a machine shop in lots of various stages of the machining process. The BATF made a visit and seized a number of the receivers. The semi-finished MKS receivers that were seized had features such as a solid (versus drilled per drawing F7790189) lug on the rear right bottom side, an operating rod center notch and a groove on the forward bottom side of the operating rod rail. After the BATF left the building, the machine shop was left with some of the MKS forgings in various stages of machining. The receivers the BATF left behind had none of the select fire features mentioned above. Some had a little machining completed and some were almost finished. In early 2003, the LRB contractor, J. V. Precision Machine, was able to finish the machining operations on the former MKS forgings. LRB of Long Island, Inc. sold the receivers with the markings LRB ARMS M14SA. Based on how many receivers were in each stage of the machining process, they were divided into groups for numbering, i.e., ten in the first group, four in the second group, forty-nine in the third group, and eight in the fourth group.

The first ten LRB receivers sold had the least amount of machining needed for completion. These are marked as X00101 through X00110. The next five M14SA receivers needed a little more machining to complete than the first ten and are marked as 00101 to 00104. These needed a little more machining to complete than the first ten. The third group of M14SA receivers, forty-nine of them, starts at serial number 01001. These required more machining than the first two sets. The fourth group of M14SA receivers which began as MKS units starts at serial number 01101 and ends at 01108. These required even more machining than the first three sets.

Subsequent M14SA receiver serial numbers start at 01201. These receivers are forgings made after the machine shop had used up all the forgings previously made for MKS. Receivers starting with serial number 01201 are forged at Bourdon Forge Company. Between receivers numbered 01217 and 01227 inclusive, the serial number marking was changed from a dot matrix to a roll die stamping. The first operating rod channel marking for the LRB M14SA receiver was JV PRECISION SEYMOUR CT USA. The operating rod channel marking changed to JVP SEYMOUR CT USA somewhere between serial number 01211 and 01237. LRB Arms M14SA receivers between 01500 and 01620 were machined a little too high for the firing mechanism. This is easily accommodated by either: 1) filing a small amount of metal off the top surface of the magazine latch plate or 2) removing a small amount of stock material where the trigger housing pads rest or 3) by installing a used firing mechanism.

At the 2004 SHOT Show, LRB displayed two prototype M14SA receivers each with two integral M1913 Picatinny rail pads. The receiver rail pads are located on top of the barrel ring and at the cartridge clip guide dovetail mount. Known as the LRB Arms M25, the first prototypes of these M1913 integrated rail receivers were forged in October 2004. Subsequent development led to an improved design by the fall of 2006. By November 2006, the two integrated rail pads had been replaced with two dove tail attachment points to be used in conjunction with a removable M1913 rail. The receiver is drilled and tapped for two socket head screws to secure the removable M1913 rail in place. The removable M1913 rail was machined from AISI 4140 alloy steel. It allows the use of iron sights when the optical sight is removed. This change made the M25 receiver more versatile in accommodating optical sights with various eye relief distances. As previously mentioned, the LRB Arms M25 receiver does not have the left side scope mount geometry since it is not needed. M25 serial numbers 10001 through 10012 were pre-production prototype receivers.

In December 2004, LRB Arms began selling complete M14SA rifles in limited quantities. The M14SA rifles are assembled with all USGI parts except for Criterion or Wilson Arms match grade standard contour barrels. In April 2005, the LRB Arms M14SA Tanker became available for purchase. This is a LRB Arms M14SA with an 18.5 " barrel and optional Smith Enterprise, Inc. muzzle brake. Chromium plating of either length barrel is an option to the buyer. Complete LRB Arms M14SA rifles built by the firm are warranted for one year. In the summer of 2008, LRB Arms sold a run of ninety-nine non-lugged M14SA receivers, serial numbers TFL01 through TFL99, for members of The M14 Firing Line Internet discussion forum.

**Origin of Chinese M14 Rifles**

A persistent rumor states that M14 rifles produced by the People's Republic of China were reverse engineered from enemy captured M14 rifles in Viet Nam. The story continues that 100,000 Chinese M14 rifles were produced for an armed revolution in the Philippines. In preparing for this work, the author interviewed a very reliable source with extensive firsthand knowledge of Chinese and Taiwanese production and export of small arms. The gentleman wishes not to be identified. He is referred to as Other Source # 12.

It was policy of the Chinese government until 1978 to export Marxist revolution to the world's masses, much like the former Soviet Union tried to do during its reign in eastern Europe into western Asia. This policy changed dramatically in 1978 when Deng Xiaoping assumed leadership in China. After 1978, the Chinese government pursued economic development and trade for the country, whereas before they promoted and supported communist dissident movements around the globe.

In 1965, the Chinese government reverse engineered the design for the U. S. Rifle M14 from weapons captured in Viet Nam. 100,000 M14 rifles and the necessary magazines and ammunition were produced by the Chinese for export to arm rebels in other countries. These Chinese select fire M14 rifles were made to look just like captured American M14 rifles including even the serial numbers. The Chinese government went so far as to produce 7.62 x 51 mm NATO ammunition identical to British issue ammunition, though with corrosive primers. This 7.62 x 51 mm NATO faux British-headstamped Chinese made ammunition was exported to the United States and sold on the commercial market in the 1980s. The rifles and ammunition were manufactured with U. S. and British markings so as to avoid any connection to the People's Republic of China, and possibly to serve a role in disinformation (propaganda) campaigns for the planned uprising.

The Communist Chinese government made two attempts to ship its select fire M14 rifles to the Philippines. The first attempt was largely unsuccessful and the second was a total failure. On December 26, 1968, Jose Maria Sison, founded and chaired the Central Committee of the Communist Party of the Philippines. Three years later, Sison chose Ricardo S. Malay, then a columnist for the *Manila Chronicle*, to arrange the delivery of weapons from China to the New People's Army in anticipation of an armed uprising against then-President Ferdinand Marcos. Sison was later charged with subversion and imprisoned in 1977 by the Philippine government. He was released from prison on March 05, 1986 by President Corazon Aquino. He has been in exile in the Netherlands since October 1988 serving as the Chief Political Consultant for the National Democratic Front, a coalition of left-leaning political parties, trade unions and agricultural unions in the Philippines.

The New People's Army (NPA) is the military arm of the Communist Party of the Philippines. It was established by the Communist Party of the Philippines on March 29, 1969 with sixty fighters and thirty-five rifles and handguns. Its stated goal is to overthrow the government of the Philippines through long term guerilla warfare. The peak strength of the NPA was 25,000 in the 1980s. Present estimated strength is 10,000 and growing. The NPA is organized into twenty-seven battalions of full time fighters. They operate in Luzon, Visayas and Mindanao to this day.

Ricardo Malay and his family made their way to China in July 1971. Malay and his family were later joined in China by Sison's closest colleague, Ibara Tubianosa, and four other individuals. Certain arrangements were made to package 1,200 of the M14 rifles with magazines, a quantity of ammunition, and other military items. The cargo was soon thereafter loaded onto the ship *MV Karagatan.* The ship and its cargo sailed from the Chinese naval base at Swatoy headed for Digoyo Bay, Isabela, Philippines.

Victor Corpus was an instructor and a Tactical Officer at the Philippine Military Academy (Fort Del Pilar, Baguio City, Luzon). The Philippine Military Academy is the Philippine counterpart to the United States Military Academy at West Point, NY. While on duty as the Officer of the Day, Victor Corpus allowed the New People's Army to raid the academy armory. He fled to the jungle the same day.

The New People's Army fighters, led by Victor Corpus, were waiting for the delivery of Chinese M14 rifles. However, the Philippine armed forces intercepted the shipment aboard the *MV Karagatan*. Consequently, a firefight ensued between the New People's Army fighters and the Philippine troops. Corpus and Kumander Dante, Chief of the NPA, were captured by the Philippine government troops. The NPA was only able to salvage only 200 of the 1,200 M14 rifles and little of the other military equipment Mao Zedong had approved as aid to the Philippine revolution. The 1,000 Chinese M14 rifles captured by the Philippine military are rumored to have been sent to the Philippine Military Academy and issued to the cadets for drill purposes as symbolic payback for the treachery of Victor Corpus. Victor Corpus went to prison and served his sentence. In an ironic twist of history, the Philippine government made Victor Corpus an Army Colonel after Ferdinand Marcos fled the country on February 25, 1986. Corpus went on to serve the Philippine government in various capacities including head of the National Intelligence Coordinating Agency, the Philippine equivalent of the Central Intelligence Agency.

In 1973, Sison tasked Malay to attempt another delivery of M14 rifles from China to the Philippines. He proposed that the Chinese prepare a shipment of M14 rifles in watertight packages to be dropped off the Pangasinan coast for recovery by scuba divers. Months later in December 1973, Malay and Tubianosa flew to Sanya, Hainan. Hainan is the southernmost island of China. Sanya is the capital of Hainan as well as the location of a Chinese naval base. When Malay and Tubianosa arrived at Sanya, they were briefed by a Chinese military officer regarding the packaging of the M14 rifles. The rifles were vacuum packed inside reinforced plastic bags with three rifles to a sack. Each sack also contained ammunition. The Chinese military officer had a team that had previously tested the packaging to make sure it would hold in the ocean environment. Malay and Tubianosa flew to Beijing the next day. The ship *MV Andrea,* with four crew members, was assigned to transport the M14 rifles and eight New People's Army fighters to the Philippine Pangasinan coast. Enroute to Sanya, the ship struck a reef somewhere in the Pratas Islands of the South China Sea. The twelve men aboard (four crew members and the eight New People's Army fighters) the stranded vessel were picked up and taken to Hong Kong by a passing Hong Kong salvage ship, the *Oriental Falcon*. In exchange for passage to Hong Kong, the *Oriental Falcon* was allowed to keep the *MV Andrea* for scrap. After a stay in a Hong Kong jail, the Filipino New People's Army fighters were released due to intervention of the Chinese Red Cross and the ship's Chinese crew was quickly moved to the Chinese mainland.

In the early 1980s, Other Source # 12 traveled to China. He was shown the remainder of the approximately 100,000 Chinese manufacture select fire M14 rifles. The Chinese M14 rifles were packed in crates in one warehouse while the British-marked, Chinese produced 7.62 x 51 mm NATO ammunition was stored in a separate warehouse. Some time after this, the select fire M14 rifles were disassembled and only the receivers were destroyed. Since there were no furnaces or ovens in the local vicinity for melting steel, the receivers were mixed with concrete to make concrete blocks for building projects. A limited number of the Chinese select fire rifles, minus the selector lugs, were sold on the commercial market in Canada and New Zealand in the 1980s. Parts from the select fire M14 rifles were later exported to the United States as M14 parts kits for use by Federal Ordnance, Armscorp of America and Century Arms International in 1991 and 1992 to build rifles with American made receivers. Surplus parts suppliers such as Northridge International, Inc., Numrich Gun Parts Corporation and Sarco, Inc. stocked Chinese M14 parts for retail sales until they sold out. The ammunition was exported as well to the United States for commercial sale. It was reliable and accurate ammunition.

### Norinco and Poly Technologies Corporation

M14 type rifles exported to the United States from China have been stamped as two brands, Poly Technologies Corporation and Norinco (1992 address 7A Yue Tan Nan Jie P. O. Box 2137 Beijing, People's Republic of China 100045). Norinco is formally known as China North Industries Corporation. Norinco is owned by the government Ministry of Ordnance Industry. It is an enormous business conglomerate that deals in military defense products, engineering contracting, optical products, oil production, chemical products, small arms, ammunition, automobiles, hotels and other real estate, travel and logistics services, and rare mineral products.

However, Other Source # 12 explained what Norinco is in another way. Norinco was set up as a committee decades ago to supply war materials to prosecute the war in Viet Nam against the United States. Viet Nam was heavily dependent upon China during the war. After the change in government policy in 1978, there was no military need for Norinco. In 1980, Norinco was established as an export corporation since Chinese arms factories cannot sell directly to anyone but the Chinese government. Thus, Norinco has exported small arms and ammunition for sale in the commercial market of various countries since the 1980s. Norinco entered the U. S. market in May 1986. Richard Chen was the U. S. representative for Norinco. In 1998, Norinco spun off its civilian small arms and ammunition marketing and sales operation, with government approval, into the wholly owned subsidiary registered as Norinco Armsports Co., Ltd. Norinco Armsports Co., Ltd. is also known as Norinco Sports. Due to U. S. government trade sanctions, a two year import ban was placed on all Norinco goods in May 2003. The registered trademark for Norinco was cancelled by the U. S. Patent and Trademark Office in December 2003.

Poly Technologies Corporation (Beijing, People’s Republic of China) was established in June 1984 by the People’s Liberation Army. Poly Technologies was made a subsidiary of China International Trust and Investment Corporation on paper. In reality, Poly Technologies was under the influence of the People’s Liberation Army. Poly Technologies exported military ordnance from small arms to missiles for sale until at least 1997. PTK International, Inc. (then 2814 New Spring Road Suite 340 Atlanta, GA 30339) was the main subsidiary of at least seven U. S. companies owned by Poly Technologies. PTK International was headed by Baoping "Robert" Ma. The company was in the business of importing and distributing various Chinese made semi-automatic rifles for commercial sales from May 07, 1987 until August 06, 1996.

**Production and Export of Chinese M14 Rifles**

All Chinese semi-automatic M14 rifle receivers and new (post-1978) production parts for them have been manufactured at State Arsenal 356 in Yunnan Province, People's Republic of China. Yunnan Province is in southwest China and borders the nations of Laos and the Socialist Republic of Viet Nam. State Arsenal 356 was built inside a hill. The floor plan of the arsenal was horseshoe shaped. During the 1980s, Mr. Wu was the Chief Engineer of State Arsenal 356. He passed away in the mid-2000s. All Chinese M14 type receivers are drop forged. Select fire and semi-automatic only M14 type rifles have been produced for Norinco. Poly Technologies models are semi-automatic only. Production of semi-automatic only M14 receivers ran from 1987 to at least 1994 and possibly until 1997.

Chinese semi-automatic M14 rifles have been directly exported to Canada, Germany, New Zealand, Norway and the United States for sale to private owners. At least one Norinco M14 Sporter imported by Century Arms International had made its way to the Netherlands by 2005. Chinese M14 rifles exported to Canada around 1987 were rendered semi-automatic only in order to comply with Canadian law. Chinese semi-automatic M14 type rifles were imported into Germany in early 1987. Germany requires firearms that are imported or sold to an individual must be proof fired with a cartridge loaded to 30 % higher than normal chamber pressure. After successful firing, the barrel is stamped with a proof marking. This testing was done for the Chinese rifles imported into Germany.

New Zealand - Firearms in New Zealand are regulated under the Arms Act 1983 and the Arms Regulations 1992. Gun owners there have been licensed since 1992. A private individual in New Zealand must obtain a firearms license issued by the police before a rifle, shotgun or pistol may be legally owned and used. To obtain the firearms license, the applicant must pass a test on firearms ownership, use and storage, and successfully pass a criminal background check. An arms officer from the New Zealand Police inspects the means of storing firearms at the applicant's home. Ammunition must be kept in separate locked storage. As is typical with government licensing everywhere, the New Zealand firearms license may be revoked for various reasons (conviction for domestic violence, drunk driving, or a crime punishable by prison sentence) and it has an expiration date, ten years in this instance. When not in use, all firearms must be kept in locked storage. Briefly, there are five categories of New Zealand firearms license endorsements: "A" - long guns except military style semi-automatic rifles, "B" - pistol, "C" - collector (allows ownership of certain firearms prohibited from use, e.g., machine guns, pistols with barrels less than 4 " long), "D" - firearms dealer, and "E" - military style semi-automatic long guns.

The semi-automatic M14 type rifle meets the definition of a military style semi-automatic (MSSA) in New Zealand. In that country, a MSSA is a semi-automatic or self-loading firearm other than a pistol which featured one or more following features: 1) folding or telescoping butt stock 2) a magazine capable of holding more than fifteen .22 caliber rimfire cartridges or more than seven cartridges of any other caliber 3) bayonet lug 4) military pattern pistol grip or 5) flash suppressor.

Prior to 1992, the Chinese and USGI M14 type rifles were imported with their military features minus automatic fire capability. Thus, the Chinese M14 rifles exported to New Zealand in the 1980s were only modified by cutting off the selector lugs from the 1965 vintage receivers. New Zealand still allows private possession of a semi-automatic only M14 rifle regardless of its pedigree, Chinese, USGI or commercial US manufacture. USGI and Chinese M14 rifles can be shot in matches in New Zealand but the selector lug is either removed or the selector shaft and selector lock are welded together to render it semi-automatic only.

In 2007, Outdoor Arms imported Norinco M14 Sporter rifles into New Zealand. The rifles were packaged with two five round magazines, a sling and a cleaning kit inside a cardboard box marked Norinco M-14S. The 2007 import models were built with 1990s production receivers intended for sale to the United States. As an example, Norinco M14 Sporter serial number 008827 imported that year into New Zealand was marked as follows on the left side of the receiver above the stock line: top line - M-14 .308 NORINCO bottom line - MADE IN CHINA CJA SFLD. MI 008827. The heel of receiver was stamped with the importer's name, Outdoor Arms. These rifles were imported with faux flash suppressor and no bayonet lug. This configuration allowed them to be imported as Category A firearms instead of being classified as a MSSA and thus requiring a firearms license with a Category E endorsement.

One Norinco semi-automatic M14 type rifle model is the M305. There were two versions of the M305. Type I was assembled with a standard stock and flash suppressor and Type II featured a pistol grip stock and a stabilizer similar to the M14E2. Rifles marked M305 have been exported to Canada, Germany, New Zealand and Norway. These are marked on the left side of the receiver as follows: top line - Model 305 middle line - 7.62x51 bottom line - Made in China. The Norinco logo is placed next to the stamped text. A small number of Norinco select fire M14 rifles are available for sale in the United States as post-'86 ban dealer samples.

**Chinese M14 Rifle Export to the United States**

There have been three, possibly four, importers of Chinese M14 type rifles into the United States: 1) Keng's Firearms Specialty, Inc. (then Stone Mountain, GA) 2) Century Arms International (then St. Albans, VT) and 3) IDE USA (Southfield, MI) and/or 4) CJA (Southfield, MI). The Chinese M14 type rifles were imported into the United States from January 1988 until May 1994. As shown on an ATF Form 6 related to one of these export shipments, the importer cost of a Poly Technologies M14S in 1989 was $225.00. All complete Chinese M14 rifles imported into the United States were assembled with 1965 Chinese production parts. Each Chinese M14 rifle and its accessories were shipped in a cardboard box with a single piece styrofoam insert.

1) Keng's Firearms Specialty, Incorporated imported no more than 2720 to 2920 Poly Technologies M14 type rifles into the United States. The firm did not import any Norinco marked M14 type rifles or receivers.

2) IDE USA imported all Poly Technologies M14 rifles into the United States with serial numbers above a number between 2720 and 2920.

3) It appears that Century Arms International imported at least 1245 Poly Technologies M14 type rifles into the United States.

4) Norinco marked M14 type rifles were imported into the United States by Century Arms International and CJA.

5) The receivers of Poly Technologies M14 type rifles imported into the United States were manufactured between 1988 and 1993.

6) Norinco M14 type receivers were manufactured from 1989 until at least 1994 and possibly as late as 1997.

**Keng's Firearms Specialty, Incorporated**

Keng's Firearms Specialty, Inc. (now in Atlanta, GA) was established in 1985. The company has imported firearms and firearm accessories for commercial sale in the United States. Specifically, Keng's Firearms Specialty imported Poly Technologies M14 type rifles in 1988 and 1989. Keng's Firearms was the only company that imported Chinese M14 type rifles (Poly Technologies M14/S models) into the United States before the March 14, 1989 ban on importing military-lookalike semi-automatic rifles. This event is commonly referred to as the "1989 import ban." The Chinese M14 (Poly Technologies M14/S) rifles first appeared in the United States as part of the Keng's Firearms Specialty exhibit at the January 1988 SHOT Show. Poly Technologies M14/S serial number 0043X with a hinged butt plate and bayonet lug was imported by Keng's Firearms before March 14, 1989.

Tim LaFrance noted that he had a concern with the Chinese bolts after examining the Poly Technologies rifles at the 1988 SHOT Show. He suggested to Keng's Firearms Specialty that these rifles be evaluated because of his concern with the bolts. Consequently, Poly Technologies representatives from the People's Republic of China contacted Smith Enterprise, Inc. shortly thereafter to discuss the manufacturing of M14 rifles. Representatives from Poly Technologies met for five days with Smith Enterprise personnel, with David Keng of Keng's Firearms Specialty acting as translator. The Poly Technologies representatives were supplied with a set of USGI drawings for the M14.

After this first meeting, Poly Technologies sent raw forgings and assembled M14 rifles (Poly Technologies serial numbers 000001 through 000005) to Smith Enterprise, Inc. for evaluation and testing. Ron Smith personally test fired these first five Poly Technologies M14 type rifles. Smith Enterprise thoroughly examined and tested the Poly Technologies receivers and rifles. Chinese receivers tested after these first batch of five were found through spectrum analysis to be made of the Chinese equivalent of AISI 8620 alloy steel, the proper material for M14 receivers. The first Poly Technologies M14 rifles imported into the United States had a varying number of digits, three to six, in the serial number of each rifle. Very quickly though, no later than serial number 00077, there would only be five digits making up the serial number on each Poly Technologies M14 rifle imported into the United States.

Karl Maunz was living in Atlanta, GA when Keng's Firearms Specialty imported Poly Technologies M14/S rifles. Keng's Firearms Specialty supplied him with two Poly Technologies M14/S rifles for testing and evaluation. He found the receiver to be made of equivalent AISI 8620 alloy steel. The receiver material testing conducted by Smith Enterprise and Karl Maunz was done independently of each other. The Chinese bolts, however, were not made of the USGI drawing specified alloy steel.

The Smith Enterprise testing included hardness testing of the Poly Technologies receiver core by cutting it apart. One Poly Technologies receiver was tested to destruction by loading ammunition to create excessively high chamber pressure. The reader MUST NOT exceed powder charges as listed in reputable reloading manuals if hand loaded ammunition is used. Personal injury or death may occur if done so. The very first Poly Technologies receivers were very hard, harder than a file, which left them without the toughness provided by the relatively soft core of receivers made according to USGI specifications. The Chinese arsenal quickly corrected this by strictly adhering to the receiver heat treatment procedure.

After Smith Enterprise completed the evaluation, a second meeting of the parties involved was held. Even after this second meeting, Poly Technologies did not correct all the concerns of Smith Enterprise and Keng's Firearms Specialty had regarding the Chinese bolt. Specifically, 1) the bolt locking lugs were too narrow and 2) the carburizing and hardness remained unsatisfactory because State Arsenal 356 did not change the material to equivalent AISI 8620 steel but continued to use steel equivalent to AISI 4135. This was in spite of the fact that Keng's Firearms Specialty offered to supply USGI M14 bolts until Poly Technologies could manufacture its own bolts according to USGI specifications. Poly Technologies refused this offer from Keng's Firearms Specialty. The Chinese never changed the bolt material for M14 type rifles exported to the United States.

**Century Arms International**

Century Arms International has imported and exported firearms and accessories for more than forty years. Century Arms International was located at 5 Federal Street St. Albans, VT 05478 in the mid-to-late 1980s. By 1990, the company's address was listed as 48 Lower Newton Street St. Albans, VT 05478. The firm moved its headquarters to Boca Raton, FL in 1997 and then again to Delray Beach, FL in 2004. Phyllis Sucher co-founded Century Arms International Inc. in St. Albans, VT in 1961. In August 1984, the company was sold to new owners but she remained on board as one of the company directors until at least April 2004. Regrettably, she passed away on May 14, 2007.

Century Arms International imported Chinese M14 rifles from 1990 until at least late 1993. It imported both completed Poly Technologies rifles and Norinco M14 type rifles and receivers before May 26, 1994. Chinese M14 rifles imported by Century Arms International after March 14, 1989 and before November 30, 1990 were assembled with military style features, i.e., hinged butt plate and flash suppressor with bayonet lug, after arrival in the United States. Norinco rifles imported by Century Arms International had the least aesthetic appeal of all the Chinese M14 type rifles imported into the United States. The very first few Norinco M14 rifles imported into the United States had the operating rod rail select fire machining cuts but no selector lug. Disposition of these receivers is unknown. Typically, the chu wood stocks are serviceable but not pleasing to the eye. The Poly Technologies rifles had better looking chu wood stocks and finish.

Poly Technologies M14S and some Norinco M14 Sporter rifles imported by Century Arms International have serial numbers with a letter C prefix followed by a hyphen and four digits or it is denoted as the letter C immediately followed by five digits. Location of the serial number on the receiver varies too. Some of the serial numbers were stamped with roll dies while others were applied by electropencil. Century Arms imported the Poly Technologies rifles before the Norinco marked models.

From November 29, 1990 until importation ceased in May 1994, Century Arms International renamed the Norinco rifle, M14 Sporter or M14 S/A Sporter in some instances. Century Arms International established a facility in Montreal, Quebec by no later than 1988. The firm modified the imported Chinese M14 type rifles at this facility to comply with the March 14, 1989 import “assault rifle” and November 29, 1990 “assault rifle” parts ban in the United States. Century Arms International removed the military style features previously allowed from each rifle by cutting the flash suppressor just forward of the front sight, replacing the hinged butt plate with a rubber recoil pad and not supplying a magazine.

**IDE USA and CJA**

In April 1983, the People’s Armed Police Force was formed out of the People’s Liberation Army in China. The People’s Armed Police Force is tasked with protecting government buildings and providing security to public corporations and for large public gatherings. Some time later, China Jing An (No. 25, Xitangzi Lane North Wang Fu Jing Street Beijing 10006 People’s Republic of China) was formed as an arms export firm for the financial interests of the People’s Armed Police Force. China Jing An (CJA) operated its business in Southfield, Michigan from 1989 until at least 1997. The engraving CJA SFLD MICH appears on Norinco M14 type receivers. CJA imported Norinco M14 rifles from at least late 1992 until May 1994. At least one CJA imported Norinco receiver was marked with the model designation M-14. Other than their physical proximity to one another, nothing else is known of any relationship between IDE USA and CJA.

Most of the Chinese M14 rifles imported by IDE USA were exported by Poly Technologies. IDE USA stamped Poly Technologies M14/S serial number 090XX was purchased new from a FFL in the United States by the original owner during the fall of 1993. The original retail purchase of IDE USA imported Poly Technologies M14/S serial number 14821 occurred in November 1993. Yet another original owner reported his purchases of IDE USA imported Poly Technologies M-14S serial numbers, 13955 on December 05, 1993 for $599.00 and 23260 on February 26, 1994 for $429.95.

The marking IDE USA SLFD MICH has been observed on Poly Technologies receiver serial numbers 0292X through 25181. IDE USA (CJA ?) imported the best looking Chinese M14 rifles into the United States. Representatives from IDE USA traveled to State Arsenal 356 in Yunnan Province, People's Republic of China to discuss the assembly process of the M14 type rifles it wished to import. These rifles were assembled with new production parts with a very good finish and some were given walnut stocks. The walnut wood for these stocks was harvested in Yunnan Province.

**Chinese M14 Rifle Export to Canada**

Alan Lever of Lever Arms Service Ltd. (Vancouver, BC) imported Norinco M14 type rifles into Canada from around 1990 onward. Century Arms International imported both Norinco and Poly Technologies M14 type rifles into Canada during the early 1990s. Some Norinco receivers imported around 2002 to 2003 by Marstar Canada and by Lever Arms Service, e.g., serial number AL000680, had a blued finish instead of a phosphate coating. These receivers lack the scope mount vertical groove lug and boss. Instead, these receivers are flat on the left side have the bolt hole drilled and tapped and the horizontal groove is still present. At least some of these blued receivers are marked Model 305 7.62X51 on the left side of the receiver, e.g., serial number AL000680. At some point, Norinco serial number AL000844 found its way to Finland from Canada. Dark International Trading Company (Ontario) has imported Norinco M14 rifles from 1997 until at least September 2007.

From September 2003 until November 2008, Marstar Canada, Inc. (Vankleek Hill, Ontario) imported Norinco M14 rifles into Canada with the receivers exhibiting the CJA marking seen on American imports. These complete rifles were assembled with new Chinese manufacture parts but the receivers were the last of the residual inventory from production in the mid-1990s. At least some of these rifles are marked with the year of assembly, e.g., 2007, on the right hand side of the receiver. By 2007, the production machines used to manufacture Chinese semi-automatic only M14 receivers had been laid up for many years.

Aside from the blued finish M305 models lacking the receiver scope mount geometry, the Norinco rifles imported by Marstar had the slotted flash suppressor and scope mount recoil lug. The left side of each receiver imported in 2004 and 2005 was stamped as follows: first line - M14 .308 second line - CJA SFLD MICH third line – NORINCO MADE IN CHINA and the six digit serial number. A May 2006 import was marked on the left side of the receiver as follows: first line - M14 .308 NORINCO 00XXXX second line - MADE IN CHINA SFLD, MI. The fit and finish of Norinco rifles entering Canada after 2000 are judged to be better than that found on the 1980s and 1990s M14 type rifles exported to the United States. These M14 rifles still have chu wood stocks. Reportedly, USGI bolts fit properly in these post-'00 assembled Norinco M14 rifles. The bolt hardness is also markedly higher than bolts exported to the United States before 1994. Marstar Canada marketed the Norinco M14 rifles as the M-305 and backed them with a one year parts and labor warranty. Marstar Canada received subsequent export shipments of Norinco M14 rifles from China in November 2006 and November 2007.

**Chinese Receivers**

On the whole, Poly Technologies rifles have a better reputation for receiver surface machining and finish as compared to the Norinco stamped rifles. There is no substantial difference between Norinco and Poly Technologies receivers although Smith Enterprise found the surface hardness to vary from 41 to 60 HRC without regard to brand. Smith Enterprise, Inc. has done extensive inspection, and non-destructive testing, and destructive examination of Chinese receivers. These inspections and tests have verified that Chinese M14 receivers are made of AISI 8620 equivalent alloy steel. Chinese receivers are drop forged into forms of larger bulk and less definition than the USGI receivers were. Then, like the American manufacturers, machine tools cut away at the metal from the raw forging to create the final desired shape before carburizing and heat treatment.

Chinese receivers are not made of high carbon alloy steel such as AISI 52100 or other such high chromium alloy steel. Equivalent AISI 5100 series steel is high carbon (1.0 to 1.1 %) alloy steel that is much too hard for a rifle receiver. Because it is a high carbon steel that is thorough hardened it lacks toughness and ductility needed for the M14 type rifle. AISI 52100 alloy steel is the most commonly used steel for bearings. The machinability rating of AISI 52100 alloy steel is 40 % when in the spheroidized annealed and cold drawn condition as compared to 100 % for AISI 1112 steel. It is difficult to machine and must be quenched below room temperature to form martensite.

Post-1978 production Chinese receivers have a threaded hole for a setscrew in the barrel ring. 1965 production Chinese M14 receivers were not manufactured with the barrel ring setscrew. The post-1978 production Chinese rifles are built with a setscrew threaded far enough through the barrel ring to contact the barrel. The barrel setscrew is unnecessary for securing the barrel in the receiver. However, the Chinese manufactured their receivers this way because it is their psychological mindset.

**Markings of Exported Chinese M14 Rifles**

At this point in the story, it may be helpful to the reader to summarize the number and identifying marks of Chinese M14 type rifles brought into the United States by each importer.

Model Numbers – Norinco M14 type rifle model numbers observed are M-14, M14 Sporter, M14 S/A Sporter and M305. M14 Sporter appears to be the most common Norinco model designation. The Poly Technologies model numbers are M-14S, M14S or M14/S. The model number can be found on the receiver left side, the receiver heel or the factory barrel just behind the front sight.

Serial Numbers - The majority of serial numbers of Chinese M14 rifles are stamped above the stock line on the scope mount side, below and slightly behind the rear sight elevation knob. It is not unusual for the receiver serial number to be lightly stamped or engraved. The serial number is found on the receiver heel of early U. S. imports.

**Table 15: Norinco M14 Rifles Imported Into the United States**

| Importer, City and State | Location of Markings | Known Serial Number Range |
|---|---|---|
| Century Arms International - St. Albans, VT | C00079 to at least C08312 - serial number on receiver left side, M14 SPORTER NORINCO CHINA C.A.I. ST ALB VT on the receiver heel, caliber marking on the barrel<br>C08610 - all information on the receiver left side<br><br>92XX to 185928 - 1) barrel is marked C.A.I. St. ALB.VT. 2) serial number on the receiver left side 3) model number, caliber and CHINA either on the barrel or the receiver left side | C000006 to C09036<br><br>92XX to 9914<br>91043 to 971XX<br>1815XX to 185928 |
| CJA - Southfield, MI | receiver left side | 000001 to 008108 |

**Table 16: Poly Technologies M14 Rifles Imported Into the United States**

| Importer, City and State | Location of Markings | Known Serial Numbers |
|---|---|---|
| Keng's Firearms Specialty - Atlanta, GA | importer name, city and state on the barrel, all other information on the receiver heel | 000001 to 0272X, KFS and CAI markings on barrels to at least serial number 01965, serial numbers vary from three to six digits under 00078 |
| Century Arms International - St. Albans, VT | receiver heel | C-1245 is the highest observed serial number |
| IDE USA - Southfield, MI | receiver left side | 0292X to 25181 |

The following data has been reported for Norinco and Poly Technologies M14 type rifles imported into Canada:

**Table 17: Chinese M14 Rifles Imported Into Canada**

| Brand | Importer, City and Province | Observed Serial Number Range |
|---|---|---|
| Norinco | Lever Arms Service Ltd. – Vancouver, British Columbia | AL000006 to AL000844 |
| Norinco | Century Arms International – Montreal, Quebec | C09036 is the highest known serial number |
| Norinco | Marstar Canada – Vankleek Hill, Ontario | 0088XXX to 0092XXX |
| Norinco | Various (see note below) | 001199 to 013398 with CJA or SFLD, MI marking |
| Poly Technologies | Century Arms International – Montreal, Quebec | 00042 to 00565X |

Note: Norinco M14/M305 rifles with the CJA or SFLD, MI markings were imported into Canada from as early as 1997 until as late as November 2008 by four businesses: 1) Bell Lifestyle Products and Distributors 2) Dark International Trading Company 3) Lever Arms Service Ltd. and 4) Marstar Canada.

The serial numbers for Norinco M14 rifles with CJA markings were not imported into Canada sequentially. For example:

001199 - Imported by Marstar Canada in September 2003
002096 - Imported by Bell Lifestyle Products and Distributors in January 2005
002194 - Imported by Lever Arms Service Ltd. in December 2001
004739 - Imported by Bell Lifestyle Products and Distributors in May 2005
007926 - Imported by Marstar Canada in May 2006
008511 - Imported by Dark International Trading Company in September 2007
008568 - Imported by Bell Lifestyle Products and Distributors in March 2007
012687 - Imported by Marstar Canada in May 2006

Miscellaneous Notes – A very few Norinco rifles in the United States and Canada have no manufacturer stamping but are marked with the importer's name. Based on anecdotal reporting, it appears that most, but not all, Chinese semi-automatic only M14 receivers were marked with numbers below the stock line on the left side. Sometimes these numbers match the serial number indicated on the receiver above the stock line and sometimes not. As an example, Norinco receiver serial number 9914 has 9914 stamped on the left side below the elevation knob and 9914 is electro-penciled on the left receiver leg. There are no other markings on the receiver. Two Norinco M14 rifles imported into Canada in May 2006 had the following numbers on the receiver under the stock line on the left side, 4 2 28 14 22 and 4 3 42 22 24. The numbers under the stock line on

Chinese M14 type receivers indicates a date code. For example, Poly Technologies M-14S serial number 15079 has the following numbers under the stock line on the left side: 3 4 4 38 7. The first portion of the numbering indicates a date of April 04, 1993. The select fire 1965 production Chinese M14 receivers do not have any numbers stamped on them below the stock line.

In 1994, Smith Enterprise, then known as Smith Arms International, offered two match conditioning packages for Chinese M14 rifles, Match Grade Basic and Match Grade U.S. The Match Grade Basic service package included receiver heat treatment and glass bedding, rifle phosphate coating, recrowning the barrel muzzle, a unitized and polished gas system and a firing mechanism tune up. The customer also had a choice with either service package: 1) installation of a Smith muzzle brake or 2) National Match modification of the customer supplied USGI flash suppressor. The Match Grade U.S. service included everything in the Match Grade Basic package plus installation of a Smith supplied American made barrel and USGI bolt, stock refinishing and marking the receiver heel as follows from top to bottom: first line - U. S. RIFLE second line – 7.62-MM M-14 third line – SMITH ENT.

**United States Firearms Laws**

The following discussion of firearms laws is not legal advice. It is presented as background information since firearms laws do affect the sale, transfer and possession of the M14 type rifle. United States law separates firearms into two categories, Title 1 and Title 2. Title 2 firearms are those regulated by the National Firearms Act of 1934 (NFA). These include machine guns, short barrel rifles, short barrel shotguns, sound suppressors, destructive devices and a special class of firearm known as Any Other Weapon (AOW). An example of an AOW is a pen gun. Destructive devices include items such as grenade launchers, mortars and High Explosive rounds. Under United States law, a select fire M14 type rifle is a machine gun.

Title 1 firearms are all other post-1899 design firearms with some exceptions (paintball guns, flare launchers, flame throwers, BB guns, airsoft guns, etc.). Title 1 firearms are regulated by the Gun Control Act of 1968 (GCA). A M14 type rifle designed as semi-automatic only is a Title 1 firearm. State and local laws place additional restrictions on the sale, transfer, possession and use of firearms in the United States.

Before 1934, there was no regulation of private ownership of any firearms in the United States of America, let alone machine guns. Congress passed the National Firearms Act of 1934 and President Franklin Delano Roosevelt signed it into law on June 26, 1934. The National Firearms Act became effective July 24, 1934. The NFA was initially implemented through a federal tax regulatory document titled Regulations 88. This document was revised and published again in 1941 and 1952. At some point before 1969, Regulations 88 was incorporated into the Code of Federal Regulations. Federal firearms regulations are included in Title 27 of the Code of Federal Regulations.

The M14 rifle was officially classified as a machine gun in 1958 by the U. S. Department of the Treasury. The Internal Revenue Service Revenue Ruling 58-417 is reproduced here in its entirety:

> The Internal Revenue Service has had occasion to consider the classification status of the new U.S. Army M-14 "rifle" chambered for the 7.62mm NATO cartridge, in the light of the provisions of the National Firearms Act (Chapter 53 of the Internal Revenue Code of 1954). Held, (1) that since the M-14 "rifle" operates either fully automatically or semi-automatically on a selective basis, it is in basic design and function a "machine gun" as defined in Section 5848(2) of the Internal Revenue Code of 1954 and, accordingly subject to the provisions of the National Firearms Act, and (2) that the substitution of a selector shaft lock, in lieu of a selector lever assembly, on the M-14 "rifle" is of temporary nature and, therefore, does not materially alter the classification thereof for purposes of the National Firearms Act.

In the United States, a Federal Firearms License (FFL) is granted to an individual by the Department of Justice Bureau of Alcohol, Tobacco, Firearms and Explosives (BATFE). There are several types of Federal Firearms Licenses. The type of FFL held by the dealer legally dictates what kinds of firearms he can buy or sell. A myriad of state and local laws also affect FFL holders. The license types are as follows:

**Table 18: U. S. Federal Firearms Licenses**

| Federal Firearms License Type | Description |
|---|---|
| 1 | Title 1 firearm dealer or gunsmith |
| 2 | Title 1 firearm dealer who is a pawnbroker |
| 3 | Curio & Relic firearm collector |
| 6 | manufacturer of non-armor piercing ammunition and reloading components |
| 7 | manufacturer of Title 1 firearms and non-armor piercing ammunition and reloading components |
| 8 | importer of Title 1 firearms and ammunition |
| 9 | Title 1 and Title 2 destructive devices dealer |
| 10 | manufacturer of Title 1 firearms, Title 2 destructive devices and non-armor piercing ammunition and reloading components |
| 11 | importer of Title 1 firearms, Title 2 destructive devices and ammunition |

The type of FFL, among other requirements, also determines if the dealer can pay a Special Occupational Tax to the BATFE to import, manufacture or deal in National Firearms Act firearms (Classes 1 and 4, 2 and 5, and 3 respectively).

Firearms Identification - Firearms manufactured in or imported into the United States are required to meet the following as set forth in Title 27 of the Code of Federal Regulations. The April 2006 edition text is reproduced here:

TITLE 27--ALCOHOL, TOBACCO PRODUCTS, AND FIREARMS

CHAPTER II--BUREAU OF ALCOHOL, TOBACCO, FIREARMS, AND EXPLOSIVES, DEPARTMENT OF JUSTICE

PART 478 COMMERCE IN FIREARMS AND AMMUNITION

Table of Contents Subpart F - Conduct of Business Sec. 478.92 How must licensed manufacturers and licensed importers identify firearms, armor piercing ammunition, and large capacity ammunition feeding devices?

(a)(1) Firearms. You, as a licensed manufacturer or licensed importer of firearms, must legibly identify each firearm manufactured or imported as follows: (i) By engraving, casting, stamping (impressing), or otherwise conspicuously placing or causing to be engraved, cast, stamped (impressed) or placed on the frame or receiver thereof an individual serial number. The serial number must be placed in a manner not susceptible of being readily obliterated, altered, or removed, and must not duplicate any serial number placed by you on any other firearm. For firearms manufactured or imported on and after January 30, 2002, the engraving, casting, or stamping (impressing) of the serial number must be to a minimum depth of .003 inch and in a print size no smaller than 1/16 inch; and (ii) By engraving, casting, stamping (impressing), or otherwise conspicuously placing or causing to be engraved, cast, stamped (impressed) or placed on the frame, receiver, or barrel thereof certain additional information. This information must be placed in a manner not susceptible of being readily obliterated, altered, or removed. For firearms manufactured or imported on and after January 30, 2002, the engraving, casting, or stamping (impressing) of this information must be to a minimum depth of .003 inch. The additional information includes: (A) The model, if such designation has been made; (B) The caliber or gauge; (C) Your name (or recognized abbreviation) and also, when applicable, the name of the foreign manufacturer; (D) In the case of a domestically made firearm, the city and State (or recognized abbreviation thereof) where you as the manufacturer maintain your place of business; and (E) In the case of an imported firearm, the name of the country in which it was manufactured and the city and State (or recognized abbreviation thereof) where you as the importer maintain your place of business. For additional requirements relating to imported firearms, see Customs regulations at 19 CFR part 134.

(2) Firearm frames or receivers. A firearm frame or receiver that is not a component part of a complete weapon at the time it is sold, shipped, or otherwise disposed of by you must be identified as required by this section.

**U. S. Law and the Chinese M14 Rifle**

The U. S. Department of Treasury import ban of March 14, 1989 affected the Chinese M14 rifles then being brought into the United States. After the import ban, Chinese M14 type rifles entered the US market with a rubber recoil pad instead of the M14 style hinged butt plate, the bayonet lug ground off, the flash suppressor castle nut welded on and the flash suppressor either removed or installed without the open slots which made the item suppress muzzle flash. From November 30, 1990 onward, the Chinese rifles were usually imported without an accompanying magazine. A known exception is the case of Century Arms International. After June 1992, Century Arms supplied a Chinese twenty round magazine blocked to five rounds capacity with each Chinese rifle for an unknown period. Each modified Chinese magazine had a metal block welded to the bottom of the follower to limit its capacity to five rounds. Presumably, the magazine modification was performed to comply with the July 1992 passage of the Canadian magazine capacity ban. Century Arms International imported Chinese M14 rifles into Canada before they arrived in the United States. Until November 30, 1990 one could install imported parts that would restore the Chinese M14 type rifle to a configuration prohibited from import after March 14, 1989.

On November 30, 1990 the assembly of imported rifles using imported parts to circumvent the import ban became illegal by federal regulation, which has the force of law. The BATF on that date published regulations to enforce Title 18 U. S. Code section 922 (r). These regulations prohibit the assembly of a semi-automatic rifle (or shotgun) using more than ten specified imported parts if that firearm was banned from importation after March 14, 1989. So, after November 29, 1990 the importer or owner of a Chinese M14 type rifle could have replaced a sufficient number of Chinese parts with USGI parts to “domesticate” the rifle (create the legal equivalent of a non-import rifle by making it comprise no more than ten specified import parts), thereby allowing the installation of a slotted flash suppressor with bayonet lug, and pistol grip stock or folding stock. This was legal under federal law until September 13, 1994.

On September 13, 1994 the Violent Crime Control and Law Enforcement Act went into effect. Effective September 13, 1994, all semi-automatic M14 type rifles were allowed only one specified feature if assembled on or after that date. Typically, manufacturers chose the lugless slotted flash suppressor for the one feature. If a sufficient number of specified Chinese parts were replaced with USGI parts on a Chinese M14 type rifle after September 13, 1994 so that no more than ten specified imported parts were in the rifle, a lugless slotted flash suppressor was permissible under federal law. Effective September 13, 2004, the 1994 Violent Crime Control and Law Enforcement Act regarding features on semi-automatic centerfire rifles was automatically repealed by the sunset provision.

Thus, the federal laws regarding features and imported parts on Chinese and American semi-automatic M14 type rifles revert back to what existed on September 12, 1994. Some cities and states restrict features of magazine fed semi-automatic centerfire rifles, e.g., Buffalo, California, Chicago, Connecticut, Massachusetts, New York, New York City, Rochester and Toledo. Consult federal, state and local laws before changing any features on any firearm.

After the March 14, 1989 import ban and before May 26, 1994, Armscorp USA, Federal Ordnance and Century Arms International assembled M14 type rifles using American made receivers and Chinese parts sets. Poly Technologies M14 type rifles in the United States are generally regarded as having been imported and assembled prior to September 13, 1994. Reportedly, some Norinco M14 type rifles were sold prior to September 13, 1994 and some were warehoused by Century Arms International and then assembled and sold after September 13, 1994.

Domestication of The Chinese M14 Type Rifle – The owner of a Chinese M14 type rifle imported into the United States after November 29, 1990 may install a slotted flash suppressor with a bayonet lug in the United States if no more ten specified imported parts are in the assembled rifle and if allowed by state and local laws. If the import date or assembly date in the United States for a particular Chinese M14 cannot be solidly documented before November 30, 1990, the rifle owner should not assume it to be so in order to remain within the law. From Title 27 Code of Federal Regulations revised April 01, 2007:

Sec. 478.39 Assembly of semiautomatic rifles or shotguns.

(a) No person shall assemble a semiautomatic rifle or any shotgun using more than 10 of the imported parts listed in paragraph (c) of this section if the assembled firearm is prohibited from importation under section 925(d)(3) as not being particularly suitable for or readily adaptable to sporting purposes.

(b) The provisions of this section shall not apply to:
(1) The assembly of such rifle or shotgun for sale or distribution by a licensed manufacturer to the United States or any department or agency thereof or to any State or any department, agency, or political subdivision thereof; or
(2) The assembly of such rifle or shotgun for the purposes of testing or experimentation authorized by the Director under the provisions of Sec. 478.151; or
(3) The repair of any rifle or shotgun which had been imported into or assembled in the United States prior to November 30, 1990, or the replacement of any part of such firearm.

(c) For purposes of this section, the term imported parts are:
(1) Frames, receivers, receiver castings, forgings or stampings
(2) Barrels
(3) Barrel extensions

(4) Mounting blocks (trunions)
(5) Muzzle attachments
(6) Bolts
(7) Bolt carriers
(8) Operating rods
(9) Gas pistons
(10) Trigger housings
(11) Triggers
(12) Hammers
(13) Sears
(14) Disconnectors
(15) Buttstocks
(16) Pistol grips
(17) Forearms, handguards
(18) Magazine bodies
(19) Followers
(20) Floorplates

Semi-automatic Chinese M14 type rifles as imported into the United States, did not have these four parts: barrel extension, mounting block (trunion), bolt carrier, and pistol grip. *One possible method* of installing an American made flash suppressor with a bayonet lug, where allowed by state and local law, while complying with 27 CFR 478.39, is as follows.

Leave these ten specified parts on the Chinese manufacture M14 type rifle: receiver, barrel, operating rod, trigger housing, sear, trigger, hammer, bolt, disconnector and gas piston. The U. S. Rifle M14 nomenclature does not include the term "disconnector." No part of the rifle is named "disconnector" in any of the U. S. military manuals or in any of the product (part) drawings of the M14 or M14 NM rifle technical data packages. The function of a disconnector is to release the hammer when the trigger is pulled. The disconnector is a separate part in the AK47 and the M16. In the M14, the disconnect function is performed by the top lugged portion of the trigger. After the trigger is pulled and released, the trigger lug engages the hammer hooks to prevent further firing until the trigger is subsequently pulled. The M14 trigger counts as two parts for the purpose of the above list of foreign named parts.

After checking the rifle is empty of ammunition in the chamber and in the magazine, replace these six parts in this order: 1) remove the Chinese magazine (three named parts) and never use it again in the rifle 2) remove the Chinese hand guard and stock (two named parts) 3) install a USGI hand guard and American made stock 4) remove the Chinese solid faux or bobbed flash suppressor and flash suppressor nut (one named part). This leaves ten named foreign made parts in the Chinese M14: receiver, barrel, bolt, trigger housing, hammer, trigger, sear, disconnector, operating rod, gas piston. *If allowed by state and local laws*, now install a USGI flash suppressor with bayonet lug and an American made flash suppressor nut. Note that an American made flash suppressor nut will work on a Chinese barrel but not vice versa. By installing an American made flash suppressor and nut on the barrel last the rifle will not even momentarily exist in a configuration that is prohibited from importation. Installing an American made flash suppressor nut on a Chinese barrel should avoid any cute accusation of it being a foreign made "muzzle attachment."

American made parts can be installed in a Chinese M14 type rifle but the U. S. owner must not install a slotted flash suppressor or a folding stock or a stock with a pistol grip with more then ten specified imported parts from the list above on the rifle. Note that parts made by Wayne Machine, Inc. (Taipei, Taiwan) for the Springfield Armory, Inc. M1A are also imported into the United States. Disclaimer: As always, local, state and federal laws and regulations are subject to change. Note that the U. S. Code of Federal Regulations is revised annually. The rifle owner or gunsmith is responsible for complying with all current local, state and federal laws and regulations.

President William Jefferson Clinton imposed a ban on firearms and ammunition from the People's Republic of China on May 26, 1994. His decision was one part of several actions taken to renew Most Favored Nation (MFN) trading status with China. The Presidential decision to renew MFN trading status followed a year long Department of State review of China's treatment of political dissidents, prisoners, emigrants, and religious worshipers. President Clinton imposed the import ban on firearms and ammunition from the People's Republic of China based on authority granted in the Arms Export Control Act of 1976 (22 U. S. Code section 2778). Consequently, the BATF would not approve any further ATF Forms 6 to import Chinese M14 rifles. Firearms already in transit at the time of the ban were exempt though under federal law and allowed to clear U. S. Customs at the port of entry.

On April 06, 1998, U. S. Secretary of Treasury Robert E. Rubin issued an official press release declaring a ban on any further importation of semiautomatic rifles that could accept a magazine capable of holding more than ten cartridges and designed for a military assault rifle. Further, in letters dated July 13 and August 12, 2005, the BATFE stated that ATF Forms 6 would no longer be approved after December 31, 2005 for importing "any frames, receivers, or barrels for firearms that would be prohibited from importation if assembled." Under these current interpretations of the "sporting purposes" language of the 1968 Gun Control Act, Chinese M14 rifles, receivers and barrels are not eligible for importation into the United States.

**1994 Assault Weapons Ban**

On September 13, 1994 President William J. Clinton signed bill H. R. 3355 known as the Violent Crime Control and Law Enforcement Act of 1994 (hereafter referred to as the 1994 AW Ban), into law. This law created new legal categories of semi-automatic rifles and semi-automatic pistols called "semi-automatic assault weapons" (AW or AWs). Title XI of the 1994 AW Ban prohibited any future manufacture, transfer to or possession by civilians of certain semi-automatic rifles and pistols made after that date, and also outlawed any future transfer to or possession by civilians of newly-manufactured ammunition feeding devices (commonly called magazines) with a capacity exceeding ten cartridges. This law was written with a ten year sunset provision, wherein the law by its own terms would expire on September 13, 2004 if Congress took no action to renew or extend the 1994 AW Ban.

Before this federal law expired, a number of states enacted their own permanent bans on certain semi-automatic firearms (by name and/or physical features). Some states also prohibited civilian possession of ammunition feeding devices capable of containing a specified number of cartridges, either in connection with their own versions of an AW ban or without affecting civilian ownership of semi-automatic firearms. Most states' laws of this sort did not apply to firearms and/or magazines already in possession, while other states required citizens owning the affected items to either surrender them to law enforcement officials, register them with the state government, sell them out of state (or to a licensed firearms dealer who could then sell the newly-declared contraband only to law enforcement or military users), or store them out of state. Such states included California, Connecticut, Hawaii, Maryland, Massachusetts, New Jersey and New York. As it related to the M14 type rifle, the 1994 AW Ban limited the number of specified features it could possess. The applicable sections of this expired federal law are set forth below:

> TITLE XI--FIREARMS SUBTITLE A--ASSAULT WEAPONS
>
> SEC. 110102. RESTRICTION ON MANUFACTURE, TRANSFER, AND POSSESSION OF CERTAIN SEMIAUTOMATIC ASSAULT WEAPONS.
>
> (a) RESTRICTION- Section 922 of title 18, United States Code, is amended by adding at the end the following new subsection: `(v)(1) It shall be unlawful for a person to manufacture, transfer, or possess a semiautomatic assault weapon.
>
> (b) DEFINITION OF SEMIAUTOMATIC ASSAULT WEAPON- Section 921(a) of title 18, United States Code, is amended by adding at the end the following new paragraph: `(30) The term `semiautomatic assault weapon' means-- `(B) a semiautomatic rifle that has an ability to accept a detachable magazine and has at least 2 of-- `(i) a folding or telescoping stock; `(ii) a pistol grip that protrudes conspicuously beneath the action of the weapon; `(iii) a bayonet mount; `(iv) a flash suppressor or threaded barrel designed to accommodate a flash suppressor; and `(v) a grenade launcher;

Consequently, manufacturers and gunsmiths in the United States almost always assembled M14 type rifles with a fixed stock and lugless flash suppressor or muzzle brake while the 1994 AW Ban was in effect. After the federal AW ban expired, Springfield Armory, Inc. M1A rifles were still shipped from the factory with either a lugless flash suppressor or muzzle brake and a ten round magazine because of the various state AW bans in effect.

**Canada Firearms Laws**

Until about 1978, a USGI M14 rifle was treated the same as any other rifle under the law in Canada. Canada then implemented restrictions on the ownership of firearms capable of automatic fire. Since 1992, firearms in Canada have been assigned to one of three legal categories: 1) Non-Restricted 2) Restricted and 3) Prohibited. A semi-automatic only M14 type rifle, e.g., Springfield Armory, Inc. M1A, is classified as a Non-Restricted firearm. Semi-automatic only M16 type rifles are listed as Restricted firearms. A rifle with a barrel less than 18.5 " long is also categorized as a Restricted firearm. Fully automatic and "converted automatic" rifles are both classified as Prohibited firearms. The category of Prohibited Weapon, later changed to Prohibited Firearm, was created in 1978 by passage of a bill in the Canadian Parliament. A select fire capable M14 is considered as fully automatic. A M14 that was select fire capable but rendered semi-automatic only is called a "converted automatic." Canadians may still possess USGI M14 rifles but are prohibited from shooting them and the selector shaft and sear release is welded together or the selector lug is cut off.

Effective October 01, 1998, the Firearms Act requires a Canadian firearm owner to possess a valid license, known as a Possession and Acquisition License (PAL). After obtaining the PAL, the firearm owner is required to register each firearm. A Registration Certificate for each firearm is issued to the licensee. To obtain a PAL, the applicant must successfully pass at least one firearms safety course, submit an application and pay a fee. The licensee must pass an additional firearms safety course and pay a higher fee to obtain a PAL that allows possession of Restricted firearms. The PAL is issued for a period of five years.

Moving a Restricted or Prohibited firearm from the owner's residence requires obtaining an approved Authorization To Transport (ATT) document from the appropriate Province Chief Firearms Officer. Regardless, an ATT cannot be approved for taking a Prohibited long gun to a shooting range. Firearms in Canada are also subject to storage, display, and handling regulations. There are also individual Province regulations and licensing for hunting activities. Interestingly, a non-resident can legally obtain a PAL and all necessary Registration Certificates and ATT documents. Effective July 01, 1993, all semi-automatic centerfire rifle magazines must be modified to accept no more than five cartridges.

Disclaimer: The reader is encouraged to research state and local laws regarding magazine feeding devices and semi-automatic firearms to avoid violating any law. Nothing in this work is to be interpreted as offering legal advice, and the author encourages anyone with legal questions to consult with an attorney, or an attorney with a government authority responsible for enforcing the relevant law(s) and who is assigned responsibilities relating to enforcement of those laws.

**Part 2 Notes**

1. Duff, Scott A. and CWO John M. Miller. p. 14 and Poyer, Joe. p 20. Ownership of the company changed in November 1974 according to Duff and October 1974 according to Poyer. A search for "Springfield Armory" on the U. S. Patent and Trademark Office web site shows that the name has been used in commerce since November 01, 1974. Mr. Ballance agreed that the sale to Bob Reese occurred during the fall of 1974 (author's October 08, 2004 telephone interview).

# Part 3

# All Things Small and Wonderful

**M14 Barrel Material**

Typically, commercial manufacture M14 type rifle barrels are made of AISI 4140 alloy or AISI 416 stainless steel. While much has been written discussing the merits of molybdenum-chromium versus stainless steel for barrels the best evidence seems to indicate that both are equal in match accuracy for at least the first 5000 rounds. Throat erosion and accuracy degradation occurs slowly and steadily in AISI 4140 barrels. AISI 416 stainless steel barrels tend to retain consistent accuracy then suddenly develop significantly larger shot groups. The advantage of the stainless steel barrel is better general surface corrosion resistance.

**General Information on AISI 4140 Alloy Steel**

The following information on AISI 4140 alloy steel is presented as background information. It is a medium carbon molybdenum-chromium alloy steel. Its description is as follows:

Typical Uses – This is a very common alloy steel. It is used to manufacture gears, axles, connecting rods, hand tools, etc.

Features - Toughness, good ductility and good torsional and fatigue strength

Machinability – Average surface cutting speed is 110 feet per minute. The machinability rating is 66 % of AISI 1112 in the annealed condition.

Forming – Good in the annealed condition

Normalizing – Typically heated at 1675 degrees Fahrenheit for sufficient time to ensure thorough heating then allowed to air cool

Hardening – This alloy can be hardened by 1) normalizing by heating to 1550 Fahrenheit then oil quenching then tempering or 2) annealing then cold working.

Annealing – Heat to 1600 degrees F then slowly cool in the furnace.

Forging – Forging is performed from 2200 degrees to 1750 degrees F.

Tempering – The steel is heated at temperatures ranges from 400 to 1200 degrees F depending on the hardness wanted. The lower the tempering temperature the higher the hardness and tensile strength. For example, AISI 4140 steel that is oil quenched then tempered to 1300 degrees Fahrenheit has an ultimate tensile strength of 118,000 psi. The same steel that is oil quenched and tempered to 700 degrees Fahrenheit has an ultimate tensile strength of 231,000 psi.

**General Information on AISI 416 Stainless Steel**

Stainless steels are alloy steels with at least 10.5 % chromium content and nickel content ranges from 0 to 22 %. Stainless steel alloys are divided into five types, austenitic, duplex, ferritic, martensitic and precipitation hardening. Each type of stainless steel has its own set of characteristics. This in turn determines the suitability for a given application. For example, martensitic stainless steels are chosen for applications where high mechanical strength is needed and corrosion resistance is not critical. AISI 416 alloy is a martensitic stainless steel. Its description is as follows:

Typical Uses – Valve parts, pump shafts, bolts and nuts, gears, electric motor shafts, gears

Features – Very good corrosion resistance, good strength, excellent machinability, poor weldability and magnetic in all conditions

Machinability – The machinability rating is 85 % of AISI 1112 steel. This alloy was the first free machining stainless steel developed. It has the highest machinability rating of any common stainless steel.

Hardening – This alloy can be hardened by heating between 1700 and 1850 degrees Fahrenheit, quenching in oil and tempering. This process first produces 100 % austenite structure followed by formation of martensite.

Annealing – For a full anneal, heat AISI 416 stainless steel to between 1500 and 1650 degrees Fahrenheit for thirty minutes per inch of thickness. Cool the steel at a maximum rate of 86 degrees Fahrenheit per hour to 1112 degrees Fahrenheit then air cool.

Tempering – First heat the steel to obtain the hardness and strength wanted. A lower tempering temperature results in higher hardness and tensile strength, while higher tempering temperatures produce lower hardness and tensile strength. When AISI 416 stainless steel is heated, oil quenched and then tempered to 1202 degrees Fahrenheit, it will have an ultimate tensile strength of 109,000 psi and a hardness of 20 HRC. The same steel that is heated, oil quenched and tempered to 399 degrees Fahrenheit has an ultimate tensile strength of 194,000 psi and a hardness of 41 HRC. Industry practice is to avoid tempering this alloy between 750 and 1076 degrees Fahrenheit because poor toughness and corrosion resistance results.

### The Barrel Making Process

Barrel making is a centuries old process. Some steps in the process may not be performed in the order described herein, depending upon the method of rifling employed. To make a rifle barrel, a hole is drilled through the center of a piece of round bar stock using a gun drill. The hole is then reamed if it will be cut or button rifled or it is honed if it will be hammer forged. Reaming and honing improve the bore finish and make the interior diameter more consistent. The barrel blank is then rifled. Rifling forms the lands and grooves of the barrel at the desired twist rate. M14 barrels are typically formed with four grooves but some have five, six or eight grooves.

Rifling is performed using one of three methods: 1) cut 2) button and 3) hammer forging. Cut rifling uses a cutter to form the barrel grooves. Krieger, Obermeyer and Satern make their barrels by the single point cut method, with the tool cutting in only one groove at a time. USGI National Match M14 barrels were produced by the broach cut method. Badger Barrels, Inc. used this method to make the M62-R1 barrels. Button rifling involves pushing or pulling a button with lands through the blank to form the grooves of the barrel. Barrel makers such as Criterion, Douglas, Hart, Shilen and Wilson Arms use the button rifling method. In hammer forging, the barrel blank starts off shorter than the finished length. The blank has a mandrel passed down the bore then it is pounded on the exterior by opposing hammers. The barrel blank is squeezed off the mandrel and cut to the desired length. TRW made chromium plated USGI M14 barrels by the hammer forging method.

After rifling, the barrel blank will usually be stress relieved. Stress relieving can be done by heat treatment or cryogenics. When drilling removes material from the bore, stresses build up inside the barrel's remaining material. If this stress is not relieved, the barrel blank can bend during the next step in the process. Such a barrel will also not shoot well. After stress relief, the barrel blank exterior contour is formed by turning it on a profile lathe. The last major metalworking step is lapping. This is done to polish the bore, remove machining marks, and achieve the desired dimensional consistency. The final machining operation is usually cutting the chamber. The barrel is stamped as desired by the maker then blued or phosphate coated if made of molybdenum-chromium alloy steel. Finished rifle barrel hardness is typically 25 to 35 HRC. For example, Smith Enterprise, Inc. M14SE 22 " and Mk 14 SEI 18 " chromium plated barrels are hardened to 35 HRC. This leaves the barrel strong enough to handle the chamber pressure with a comfortable safety factor yet tough enough to resist substantial impact.

Springfield Armory chromium plated M14 barrels were drilled, turned and plated from forged blanks. Winchester used the following procedure to make USGI M14 barrels. Re-sulphurized AISI 4150 molybdenum-chromium alloy steel was hot extruded and sheared into barrel blanks. The barrel blanks were furnace heated and oil quenched with a twenty minute cycle time for the heat treatment. Next, the barrel blank was machined by drilling the bore then turning the exterior contour by four passes on lathes. The barrel was then prepared for chromium plating by electro-polishing the bore. The chromium plating was then applied. The chromium plating was applied 0.0015 " thick at the breech end of the rifling, with the plating thickness intentionally tapered very slightly to a thickness of 0.001 " at the muzzle. The barrel bore was finished to a bright luster. The USGI chromium plated barrel bore has a minimum hardness of 850 on the Vickers scale (better than 65 HRC). The final manufacturing step was phosphate coating.

USGI M14 barrels were fired with a proof round and then examined by magnetic particle inspection for any signs of cracks, seams or other defects. If the barrel passed proof firing and non-destructive examination, it was stamped on the chamber with the symbols M and P inside a circle. USGI chromium plated M14 barrels weigh 31.7 ounces and were designed for a service life of 15,000 rounds. The USGI M14 chromium plated barrels has a time dependent maximum rate of fire. The USGI M14 with a chromium plated barrel may be fired at the following rate without damage to the rifle or injury to the operator:

Semi-automatic: 1 minute - 40 rounds per minute (rpm), 2 minutes - 40 rpm, 5 minutes - 30 rpm, 10 minutes - 20 rpm, 15 minutes - 20 rpm, 20 minutes - 20 rpm, 30 minutes or longer - 15 rpm.

Automatic: 1 minute - 60 rpm, 2 minutes - 50 rpm, 5 minutes - 40 rpm, 10 minutes - 30, 15 minutes - 30 rpm, 20 minutes - 25 rpm, 30 minutes or longer - 20 rpm.

**M14 Barrel Length**

M14 barrels vary in length and contour profile but they share some common features. Both ends of the M14 rifle are threaded. The breech end threads secure the barrel to the receiver. The muzzle end threads are for securing the muzzle attachment to the barrel. Raised outside diameter surfaces locate the operating rod guide, front band, gas cylinder and flash suppressor. The M14 barrel has female splines for locating the flash suppressor and gas cylinder. The barrel gas port channels propellant gas into the gas cylinder. The barrel chamber is cut with two longitudinal grooves for securing the hand guard band. A locating shoulder serves as a rearward stop for the front band.

The following is a list of barrel lengths for the M14 type rifle. Troy Industries had barrels less than 16 " in length installed on Rock SOPMOD M14 units upon special request. A rifle with a barrel less than 16 " long is considered a short barrel rifle in the United States (all NFA rules apply).

**Table 19: M14 Type Rifle Barrel Lengths**

| Rifle Builder | Length, contour, rate of twist, number of grooves and chromium plated? | Comments |
|---|---|---|
| Chinese | 22 ", standard, 1:12 four groove, yes | Norinco and Poly Technologies |
| Commercial | 22 ", heavy, 1:10, 1:11, or 1:12, four or six groove, no | match grade, Barnett, Douglas, Krieger Barrels, Wilson Arms, etc. |
| Commercial | 22 ", medium, 1:10, 1:11, four groove, no | match grade, Barnett, Douglas, Krieger Barrels, Wilson Arms, etc. |
| Commercial | 22 ", medium, 1:12, four groove, no | Krieger Barrels USMC M14 DMR pattern with slight changes to accommodate commercial receivers |
| Commercial | 22 ", standard | rack grade, Krieger Barrels, discontinued as of March 2008 |
| Fulton Armory, LRB Arms | 22 ", standard, 1:10 or 1:12, four, no | Wilson Arms, Criterion Barrels (1:12), Krieger (1:10) |
| Fulton Armory, LRB Arms | 22 ", standard, 1:12, four, yes | Criterion Barrels |
| Georgia Arms Precision | 22 ", heavy, 1:10, no | M62-R1, Badger Barrels, stainless steel |
| LRB Arms | 22 ", medium, 1:10, six groove, yes | supplied by Criterion Barrels |
| Smith Enterprise, Inc. | 22 ", medium, 1:10, four groove, no | M14SE, Wilson Arms, chromium-molybdenum alloy steel, M118LR chambered, SEI part number 9345-M14SE |
| Smith Enterprise, Inc. | 22 ", medium, 1:10, four groove, no | M14SE, Krieger Barrels, stainless steel, M118LR chambered |
| Smith Enterprise, Inc. | 22 ", standard, 1:10, four groove, no | M21A5, chromium-molybdenum alloy steel, M118LR chambered, SEI part number 2028 |

| | | |
|---|---|---|
| Springfield Armory, Inc. | 22 ", standard, 1:12, six groove, no | Wilson Arms blanks, standard M1A model |
| Springfield Armory, Inc. | 22 ", medium, 1:11, six groove, no | loaded standard and National Match M1A models |
| Taiwan | 22 " | T57, State Arsenal |
| U. S. Marine Corps | 22 ", medium, 1:12, four groove, no | M14 DMR and M39 EMR, Kreiger Barrels, stainless steel |
| U. S. Marine Corps | 22 ", medium, 1:11, 5 R groove, no | M14 DMR, Rock Creek, stainless steel |
| USGI | 22 ", standard, 1:12 four groove, yes | M14, USGI part number 7790190 |
| USGI | 22 ", standard, 1:12, four groove, yes | M14 NM, USGI part number 7791173 |
| USGI | 22 ", standard, 1:12, four groove, no | M14 NM, USGI part number 7791362 |
| USGI | 22 ", medium, 1:12, four groove, no | M14 NM, USGI part number 9345206 |
| USGI | 22 ", heavy, usually 1:12, four groove, no | M14 NM, USGI part number 9349847 |
| Harrington & Richardson, Inc. | 19.3 ", standard, 1:12, four groove, yes | Guerilla Gun, barrel shortened by subcontractor |
| Commercial Bush | 18.5 ", standard, 1:10, four groove, no | The Firing Line group buy, supplied by Criterion Barrels |
| Commercial Bush | 18.5 ", heavy, 1:10, 1:11 or 1:12, four groove, no | Krieger Barrels |
| Fulton Armory, LRB Arms | 18.5 ", standard, 1:12, four groove, no | Fulton Armory Bush, LRB Arms Tanker, supplied by Criterion Barrels |
| Fulton Armory, LRB Arms | 18.5 ", standard, 1:12, four groove, yes | Fulton Armory Bush, LRB Arms Tanker, supplied by Criterion Barrels |
| LRB Arms | 18.5 ", medium, 1:10, six groove, yes | LRB Arms Tanker, supplied by Criterion Barrels |
| NSWC Crane | 18 ", standard, 1:11, six groove, no | Mk 14 Mod 0, supplied by Springfield Armory, Inc. |

| | | |
|---|---|---|
| Smith Enterprise, Inc. | 18 ", standard, 1:10, four groove, yes | M118LR chambered, SEI part number 2027, only six installed on civilian rifles as of November 2006 |
| Smith Enterprise, Inc. | 18 ", medium, 1:10, four groove, no | M14SE and Mk 14 SEI, supplied by Wilson Arms, M118LR chambered, SEI part number 9345-MK14, only three installed on civilian rifles |
| Springfield Armory, Inc. | 18 ", standard, 1:11, six groove, no | M1A Bush and Scout Squad models, Wilson Arms blanks, machined by Springfield Armory, Inc. |
| Norinco | 17.625 ", standard, 1:12, four groove, yes | Imported by Gun Parts Corp. |
| Smith Enterprise, Inc. | 17.625 ", medium, four groove, no | Bush rifle conversion and initial M14 EBR models, limited number installed on civilian rifles |
| Springfield Armory, Inc. | 16.25 ", standard, 1:11, six groove, no | SOCOM M1A models |
| RD Systems | 16 ", standard, 1:11.27, five groove, no | SOPMOD M14, supplied by Mike Rock |
| Smith Enterprise, Inc. and LaFrance Specialties | 13.5 ", standard, 1:12, four groove, yes | M14K |
| Smith Enterprise, Inc. and LaFrance Specialties | 13.5 ", medium, 1:10, four groove, no | M14K, blank supplied by Douglas |

**USGI M14 Rack Grade Barrels**

Military service barrels are made of molybdenum-chromium alloy steel. M14 rack grade barrels are chromium plated, standard (lightweight) contour and have a 1:12 twist rate. There were several manufacturers of USGI M14 chromium plated barrels. The following is a list of the manufacturers along with the barrel identifying markings and *observed* dates of production:

Harrington & Richardson (H-R) - May 1960 to February 1964
Olin-Mathieson Chemical Corporation (Winchester) - November 1960 to May 1964
Saco-Lowell / Maremont (SAK, 26978) - November 1968 to May 1983
Springfield Armory (S A) - November 1959 to October 1967
Thompson-Ramo-Wooldridge (TRW) - November 1962 to April 1966

Saco-Lowell - Saco-Lowell became a part of Maremont Corporation by no later than 1971. Arvin Industries, Inc. acquired Maremont Corporation in 1986. Colt's Manufacturing Company, Inc. (West Hartford, CT) owned the Saco, ME plant from late 1998 to July 2000. General Dynamics Armament Systems, a wholly owned subsidiary of General Dynamics (Falls Church, VA) bought Saco Defense in July 2000. In May 2002, General Dynamics Armament Systems purchased Advanced Technical Products, Inc. (Roswell, GA). Consequently, the division became General Dynamics Armament and Technical Products, Inc. This facility has manufactured firearms under contract for Magnum Research, Weatherby and other commercial firearms companies. The plant also produced M60 machine guns and Mk 19 40 mm automatic grenade launchers for the U. S. military. Saco-Lowell enjoys a highly favorable reputation amongst the chromium plated M14 barrel makers.

In the spring of 2005, Smith Enterprise, Inc. extensively tested its chromium plated standard contour 1:10 twist M118LR chambered 18 " barrel. Production quantities of this barrel were delivered to Smith Enterprise, Inc. beginning in March 2006. This barrel was designed for the Mk 14 Mod 1 rifle. The barrel was intended to replace barrels on rack grade M14 rifles while being able to shoot 110 to 175 grain projectiles. These barrels have a one degree crush angle and are designed to headspace between 1.6325 " and 1.6355 " on USGI M14 receivers. The exterior of the chamber is machined to provide additional gripping surface during barrel installation. Military Specification MIL-R-45012E allows removal of chromium plating to properly headspace a barrel to the receiver. Due to variations in receiver geometry among commercial manufacturers, these barrels may not headspace properly on commercial manufacture M14 type receivers.

Chromium plating of barrel chambers and bores increases barrel life, improves sustained fire capability, enhances corrosion resistance and makes cleaning easier. The chromium plated chamber aids extraction and allows the rifle to function when fouled with firing residue and dust. The disadvantages of a chromium plated bore are a slight loss of accuracy and increased manufacturing cost as compared to a non-plated bore. The loss of accuracy is not an amount the average shooter would notice. In the plating process, the anode must be centered perfectly in the barrel to avoid uneven deposition of chromium on the bore.

A typical USGI M14 barrel marking is as follows: H R 7790190 1 63 AK. H R is the manufacturer, Harrington & Richardson, Inc. 7790190 is the USGI part number for the M14 chromium plated barrel. 1 63 is the month and year of manufacture, January 1963. AK was the material lot for the steel used to make this particular barrel. Typically, the barrel manufacturer, drawing number, date and material lot are visible by simply retracting and locking the operating rod. The exception to this rule is that some Canadian Arsenals (National Match), Springfield Armory, and Winchester barrels require the hand guard to be removed to see the factory markings.

USGI M14 barrels that have passed all inspections will have the DOD acceptance stamp, magnetic particle inspection M stamp and the proof firing circle P stamp all on the chamber exterior. Canadian Arsenals manufactured M14 barrels are the exception to this rule because they lack the DOD acceptance stamp. If there is a punch mark just inside or just outside the circle of the proof firing stamp it means the barrel was removed from a M14 rifle by the military, nothing more, nothing less.

**USGI M14 National Match Barrels**

USGI match grade M14 barrels were made to stricter dimensional standards than the rack grade barrels. In 1963, the M14 National Match barrel bore diameter was specified as 0.300 " + 0.0010 " and groove diameter was required to be 0.3075 " + 0.0010 ". Any taper in the bore had to decrease from the chamber to the muzzle. These dimensions were checked with an air gauge that had an accuracy of 0.0001 ". The M14 National Match barrel was also examined for straightness using an optical straightness gauge. The optical barrel straightness gauge was developed at Springfield Armory and was accurate to within 42 seconds of arc. The maximum deviation for straightness was 2 minutes 23 seconds of angle along the entire length of the barrel. The M14 National Match muzzle barrel was required to be free of all burrs and nicks. USGI M14 National Match grade barrels of all contour sizes were short chambered. Installation of a USGI M14 National Match barrel required finish reaming of the chamber.

According to the August 1975 *American Rifleman*, there were some chromium plated standard contour National Match barrels made at Springfield Armory in 1962 during the production run of the first 3000 M14 NM rifles. The part number for these barrels was 7791173. This was an alternative standard match barrel. It was held to the same dimensional tolerances for the bore and groove as the non-plated National Match barrel (USGI part 7791362). The chromium plating added to the manufacturing cost but did not enhance rifle performance. Consequently, chromium plating of National Match M14 barrels was discontinued. With this one exception, match grade M14 barrels are not chromium plated.

The U. S. Army Marksmanship Training Unit tested heavyweight design match grade barrels in the mid-1970s at Fort Benning. The heavyweight barrel was found to significantly improve target group size and required much less external contour machining. The longer operating rod guide adopted in 1982 for use on heavyweight M14 barrels was originally designed by SFC Gerald "Hook" Boutin. All other factors being equal, heavyweight barrels produce tighter target shooting groups because of better resistance to vibration and elongation from prolonged firing and the forces created from sling tension over thinner contour barrels.

The National Board for the Promotion of Rifle Practice (NBPRP) approved the heavyweight design for the M14 NM rifle used in its regional and National Trophy competitions by July 1975. The NBPRP required that M14 type rifles used in competition with the heavyweight barrels had to keep the M14 sights, stocks, hand guards, gas systems and flash suppressors. In 1979, Ohio National Guard armorer, (then Staff Sergeant) John M. Miller, tested M1A serial number 010047 for accuracy in a test tunnel. The average extreme spread for ten shot groups of match ammunition fired from a machine rest at 200 yards was 5.25 " with a 1:12 twist standard contour USGI National Match barrel and 3.35 " with a Douglas heavyweight 1:10 twist match grade barrel.

Gene Barnett (using Douglas Premium blanks), Canadian Arsenals, Hart Rifle Barrels, Krieger Barrels, Mike Rock Rifle Barrels, Nomura Machine, Saco-Lowell / Maremont, SGW, Springfield Armory, and TRW made National Match M14 barrels. The following is a list of the manufacturers for standard contour National Match barrels along with the identifying mark and *observed* dates of production:

Canadian Arsenals, Ltd. (C A) - April 1967 to June 1967
Saco-Lowell / Maremont (SAK, 26978) - July 1965 to June 1985
Springfield Armory (S A) - December 1962 to ~ 1965
Thompson-Ramo-Wooldridge (TRW) - April 1964 to April 1966

Standard contour National Match barrels are capable of respectable accuracy with good ammunition. Mr. Art Luppino was able to group 0.465 " at 100 yards with handloaded ammunition (168 grain Sierra match bullets, Federal Cartridge Company cases and F210 primers, and 41.7 grains of IMR 4895 powder) on March 19, 2007 with a Canadian Arsenals M14 National Match barrel on a Springfield Armory, Inc. M1A using iron sights.

Gene Barnett was an Army National Guard armorer before going into business. He supplied the U. S. Air Force, U. S. Marine Corps and U. S. Army National Guard with M14 National Match barrels from the early 1980s onward. Mr. Barnett retired in 2008. The Marine Corps used both medium and heavyweight barrels while the National Guard and Air Force used only heavyweight barrels from Gene Barnett. The U. S. Marine Corps marked its shooting team M14 rifle barrels with the letters RTE. RTE stood for Rifle Team Equipment.

In June 1981, the drawing for the medium weight contour National Match barrel, F9345206, was completed at the U. S. Army Armament Research and Development Command (Dover, NJ). The material, inspection, testing, marking, and coating requirements were essentially repeated from the lightweight National Match barrel drawing. However, the machining tolerances for the barrel bore and groove diameters were held to a more stringent limit. The medium weight NM barrel bore diameter was not allowed to vary by more than 0.0001 " over the entire length. The same restriction applied to the barrel groove diameter. The more restrictive diameter limits for the bore and the groove results in a more accurate barrel, all other factors being equal.

Schuetzen Gun Works (SGW) was established in 1956 by Bob Schuetz as a barrel manufacturer. The company moved from Colorado Springs, CO in 1975 to its new home of Olympia, WA. In 1982, the firm was renamed Olympic Arms. Dates of production observed for SGW lightweight match barrels extend from July 1982 through August 1983. The contract ended in September 1983. More than 1,200 of these barrels were produced. Its government contract required SGW to use steel from a particular vendor. The material lot numbers observed on SGW barrels were 45346 (1982 production) and 20084 (1983 production). SGW manufactured the barrels and delivered them to Rock Island Arsenal for assembly on M14 NM and M21 rifles. At that point, Rock Island Arsenal found the properties of this lot of steel to be inconsistent. This was the fault of the steel supplier and not SGW. For reasons not understood, the SGW barrels were distributed through the military supply system and some were installed on M14 NM and M21 rifles. Some of the SGW barrels failed during normal use. Consequently, the SGW barrels, installed and those in stock, were recalled and collected by Anniston Army Depot. From there, the barrels were sent back to SGW around 1984.

SGW then tested all the barrels for proper hardness. Those that passed testing were remarked OLY and sold. These OLY marked broach cut match grade barrels give excellent accuracy and service. WARNING: One of the SGW barrels that did not pass testing was tested for hardness at three positions on the exterior. The result varied from 10 to 14 HRC. This is too soft for a rifle barrel and unsafe to use. The M14 NM standard contour barrel is to be hardened to 35 HRC per the drawing. If a SGW M14 barrel is encountered it should be tested for hardness and evaluated by a reputable M14 gunsmith. The author observed an SGW M14 barrel for sale at a gun show in Phoenix, AZ in December 2003. Beware!

Nomura Machine made M14 medium weight National Match barrels in 1992 and heavyweight National Match barrels in 1992 and 1993. Saco-Lowell / Maremont made lightweight (standard), medium weight and heavyweight contour National Match M14 barrels. Maremont produced medium weight and heavyweight National Match barrels in 1983. Mike Rock Rifle Barrels, Inc. M14 barrels were made in 1994 and 1995 for the U. S. Marine Corps. The gas system was moved forward 0.035 " on these heavyweight barrels to increase the dwell time so that 190 grain bullets could be used in competition. These barrels should not be confused with the Rock Creek barrels used on the M14 DMR. Canadian Arsenals, Springfield Armory and TRW manufactured USGI M14 National Match barrels in the standard contour.

The USGI National Match barrels for the most part used a 1:12 twist. One exception was several Lackland AFB U. S. Air Force-built M14 NM rifles which were rebuilt by Ted Brown in the past for the Oregon Air National Guard. These Barnett barrels had a twist rate of 1:10 and were stamped USAF on the right side of the chamber.

A USGI contract M14 National Match barrel that has passed all quality assurance inspections will be stamped or engraved NM near the muzzle. Typically, match grade M14 type rifle barrels begin to lose competition level accuracy after 5000 to 9000 rounds depending on use and cleaning regimen. Non-plated barrels can provide rack grade accuracy as long as 12,000 rounds. The approximate weight for a medium weight M14 barrel is 2 pounds 6 ounces and 3 pounds 9 ounces for a heavyweight M14 barrel.

**Chinese M14 Barrels**

Chinese barrels are lightweight (standard) contour chromium plated barrels. The quality of Chinese barrels is generally very good and the chromium plating is well done. The Chinese have extensive experience in chromium plating parts because of manufacturing AK type and SKS rifles. Chinese barrels are chambered for 7.62 x 51 mm NATO ammunition. Shooters have obtained 1 " groups at 100 yards with Chinese barrels. Numrich Gun Parts Corporation imported a small quantity of 17.625 " long chromium plated Norinco M14 barrels around 2002. Otherwise, Chinese barrels are 22 " long.

**U. S. Commercial M14 Barrels**

Commercial M14 barrels in production range from 16 " to 22 " long. Installation of barrels less than 16 " long on M14 type rifles in the United States are custom made and require registration as a Short Barreled Rifle under the National Firearms Act of 1934. Where allowed by state and local law, a bayonet lug installed on barrels 18.5 " or longer will allow normal removal of the gas cylinder plug for cleaning of the gas system.

Barrel makers, such as Douglas and Krieger, offer M14 type barrels in different twist rates and choice of molybdenum-chromium or stainless steel. The standard twist rates are 1:10, 1:11 or 1:12. Commercial match barrels will be medium weight or heavyweight. 1:10 twist barrels are better for stabilizing heavier bullets, e.g., 168 grain Sierra hollow point boat tail Match. The commercial manufacturers listed below all produce high quality M14 barrels. Springfield Armory, Inc. first assembled 1:11 twist barrels on its M1A rifles in 1978.

The first commercial barrel installed on a M14 rifle was performed by U. S. Army Sergeant Telkey at the U. S. Army MTU in the early 1960s. At the time, the U. S. Army was not sure if the National Rifle Association would approve of such a modification. Commercial and match barrel makers include Citadel, Criterion Barrels, Douglas, Hart, Krieger, Obermeyer, Shilen and Wilson Arms. Douglas Barrels, Inc. (Charleston, WV) has been manufacturing rifle barrels for over fifty years. RD Systems installed a proprietary 1:11.27 twist barrel for its Rock SOPMOD M14.

Wilson Arms Company began business in 1954. The firm has been engaged in large scale rifle barrel production since the early 1960s. Wilson Arms uses CNC machining centers to produce molybdenum-chromium alloy steel and stainless steel barrels made to customer specifications. Chromium plating of the chamber and bore is available.

Shilen Rifles, Inc. began business in 1955. The company produces various rifle and pistol barrel blanks. For the M14 type rifle, Shilen offers 416 stainless steel .308 caliber barrel blanks in 1:10 and 1:12 twists.

Krieger Barrels and Obermeyer produce excellent quality custom barrels. Krieger Barrels, Inc. (Richfield, WI) was established in 1982 by John Krieger. The firm has manufactured M14 barrels for U. S. military branches since 1982. In 1999, Krieger formed another company, Criterion Barrels, to make rifle barrels for manufacturers such as Weatherby, Inc. Criterion Barrels, Inc. has produced M14 barrels from 2003 onward.

Olympic Arms produced some heavyweight match grade 1:12 twist stainless steel M14 barrels in 1985. They are marked with a proof P stamp, the brand identifer OLY, the letters SS and NM, and the month and year of manufacture. These should not be confused with the USGI contract standard weight barrels previously discussed.

In November 2003 Fulton Armory began selling chromium plated and non-plated commercial manufacture standard contour M14 barrels. Criterion Barrels, Inc. supplies these barrels to Fulton Armory. They are marked C.B.F.A. Lightweight (standard contour) and medium weight M14 barrels sold by Fulton Armory are made to its specifications and come with a limited lifetime warranty on materials and workmanship. LRB Arms was selling Wilson Arms chromium plated and non-plated standard contour M14 barrels as of May 2004. These barrels were stamped, e.g., LRB 7790190 5/04 WA. Later that same year, LRB Arms began to offer Criterion 18.5 " chromium plated and non-plated standard contour barrels. Criterion chromium plated barrels assembled on LRB Arms receivers were marked in a manner similar to the USGI drawing requirement, e.g., LRB 7790190 9/05 JG CBI. The 9/05 is representative of the month and year the barrel was made. Between 2004 and 2006 Springfield Armory, Inc. had used three standard contour barrels of the same length on its SOCOM M1A models but each with a slightly different chamber external profile.

Smith Enterprise, Inc. was to be supplied with barrels from Wilson Arms for future production M14K rifles and to fulfill a 2004 request from the Philippine government for 1,400 M14 barrels. The barrels were to be made to Ron Smith's specification. This specification required the barrel to be 22 " long, four groove standard (lightweight) contour with a 1:10 twist rate and 7.62 mm Navy chamber. The 7.62 mm Navy chamber is sized for heavier bullets. Some of the barrels were to be chromium plated and some not.

Accuracy Systems, Inc. can install a 1.100" diameter 26" stainless steel plain end barrel on a M14 type rifle. This installation includes a modified gas cylinder and gas cylinder lock. M14 barrels installed by gunsmith Tom Luhmann were marked TLC.

**USGI M14 Stock Designs**

The stock serves five basic functions for the M14 rifle: 1) reduces felt recoil to the operator 2) protects and holds the operating components 3) provides a comfortable gripping surface for the operator 4) allows attachment of a carry sling for hands free transport and 5) in some designs acts as a storage compartment for a cleaning kit.

The following list is a compilation of USGI M14 stock variations and the month and year of the original drawings. Different part numbers were assigned to the stocks, stock subassemblies and stock assemblies. Typically, a stock subassembly consisted of the bare stock, the ferrule, and the front sling swivel assembly and for wood stocks, the liner and two liner screws. The butt plate assembly and fasteners and rear sling swivel were added to the subassembly to form the stock assembly. The 1984 design M14 NM rifle stock lacks a stock liner and liner screws. The purpose of the ferrule was to protect the relatively thin front end of the stock.

1) September or October 1954 - T44E4: 7267084 - wood stock assembly (7267083 - bare stock)

2) September 1959 - M14: 7790702 - wood stock assembly (7790810 - stock subassembly)

3) December 1961 - M14 NM: 7791175 - wood stock assembly (7791280 - stock subassembly, 7791174 - bare stock)

4A) June 1964 - M14 NM: 11010281 - wood stock assembly with routing and bedding (11010282 - stock subassembly, 7791174 - bare stock)

4B) June 1964 - M14: 11010264 - wood stock assembly (11010262 - stock subassembly, 11010263 - bare stock)

5) December 1965 - M14: 11686428 - reinforced fiberglass stock assembly (5910348 - stock subassembly with upper butt screw, nut and retainer, 11686427 - stock subassembly, 11686426 - bare stock)

6) May 1984 - M14 NM: 9392337 - wood stock assembly with routing and bedding (9381706 - stock subassembly, 9362638 - bare stock)

**USGI M14 Wood Stocks**

Background Information – The information on black walnut, yellow birch and cherry wood is presented below for the benefit of the reader.

Black Walnut (*Juglans nigra*)

Description – The heartwood color is light gray brown to chocolate brown to purple-black brown. The sapwood is colored creamy white to yellow brown. Black walnut has a straight grain typically but the grain can be wavy or curly. Its texture is coarse. Walnut can be steamed to make the sapwood darker and the heartwood lighter which allows more of the tree to be used. Steaming is done for aesthetic purposes and does not otherwise change the properties of walnut.

Common Uses – Gunstocks, furniture, cabinets, musical instruments, and other uses. It is an excellent wood for carving and lathe turning.

Durability – Black walnut is very durable. The sapwood is susceptible to attack by the powder post beetle. The heartwood is resistant to preservative treatment and biodegradation.

Yellow Birch (*Betula alleghaniensis*)

Description – The heartwood color is light brown to reddish brown. The sapwood is colored light red brown or light yellow. Yellow birch has straight, close grain and a fine, even texture.

Common Uses – Furniture, high grade flooring and plywood, upholstery frames among others

Durability – Yellow birch is perishable and susceptible to attack by the furniture beetle. The heartwood is moderately resistant to preservative treatment. The sapwood is permeable.

Cherry (*Prunus serotina*)

Description – The heartwood color varies from red to reddish-brown to deep red. There may be brown flecks in the heartwood. The sapwood is colored creamy white to creamy pink to reddish brown. Cherry has a fine, straight grain and a smooth texture.

Common Uses – Furniture, cabinets, flooring, boat interiors, and others. It is an excellent wood for carving and lathe turning.

Durability – Cherry is moderately durable. The heartwood is moderately resistant to preservative treatment. The sapwood is susceptible to attack by the furniture beetle.

Wood blanks supplied for military small arms were inspected and sampled to meet minimum requirements for general condition, grain slope, moisture content, end coating, and contractually specified dimensions. Wood blanks were inspected to be free of splits, honeycombing, brashness, checks, shakes and excessive warping and shrinkage.

Defects such as sapwood, mineral streaks, burly grain and a limited amount of sound pin knots and pinworm holes were allowed. The grain slope for M1 and M14 rifle stock wood blanks could not vary more than 1 " from the horizontal for any 12 " in length in the critical area. The critical area for M1 and M14 rifle wood stock blanks was defined as the forward 26.5 " + or - 1" of the blank. Average moisture content for kiln-dried blanks was limited to 6 to 8 percent. Air-dried wood blanks could not have more than 25 percent average moisture content. Green wood blanks had no limits for moisture content. Both ends of every wood blank supplied were required to be coated to control split ends. If the number of unsatisfactory blanks examined exceeded the allowable number for a given lot size, the entire lot was rejected. Regardless, any unsatisfactory condition specimen was not accepted. Kiln-dried wood blanks were sampled for case hardening. No more than two of the fifty-four specimens of each kiln charge were allowed to fail the case hardening test. If so, the entire kiln charge lot was rejected.

**Table 20: Properties of Walnut, Birch and Cherry**

| Material Property | Black Walnut | Yellow Birch | Cherry |
|---|---|---|---|
| density (lb/ft$^3$) | 40 | 43 | 36 |
| specific gravity | 0.59 | 0.62 | 0.54 |
| Janka hardness (pounds) | 1010 | 1260 | 950 |
| modulus of elasticity (psi) | 1,790,000 | 2,010,000 | 1,665,000 |
| bending strength (psi) | 14,800 | 16,600 | 13,520 |
| shearing strength (psi) | 1,370 | 1,880 | 1,700 |
| compression parallel to the grain - maximum crushing strength (psi) | 7,680 | 8,170 | 7,865 |

USGI Wood Stock Production - Springfield Armory, Harrington & Richardson, and Winchester made wood stocks for their USGI M14 rifles. Frank Overton was the owner of S. C. Overton & Co. (South Haven, MI). This company was the largest employer in South Haven, MI when it went out of business in 1990. From World War II until 1990, S. C. Overton & Co. produced M1 Carbine, M1 Garand and M14 stocks and M1 Garand hand guards. It was the exclusive supplier to TRW for walnut and birch M14 stocks. Early S. C. Overton & Co. M14 stocks were made from black walnut but most were made from birch harvested from a single forest in Maine near the Canadian border. The black walnut wood came from the U. S. government stockpile. The wood was shipped at government expense to S. C. Overton and formed on government owned stock making machinery operated by S. C. Overton & Co. employees. The automatically operated multi-station machines performed all woodworking operations except the finish sanding. Overton birch M14 stocks tend to be stained a very dark brown. The production rate for these machines was 400 stocks per hour. The M14 stock making machinery was converted around 1971 or 1972 to produce M1 Garand stocks for a new government contract. S. C. Overton & Co. was still producing M1 Garand stocks and inventoried contract over run M14 stocks when it closed down in 1990. S. C. Overton & Co. had also manufactured match grade M14 stocks for Karl Maunz. Sykes Manufacturing made replacement M14 stocks for Springfield Armory.

The basic process of making a wood gun stock can be divided into four steps. A rectangular piece of wood is first shaped to create the rough exterior outline of the stock. Next, the interior geometry of the stock is formed with inletting tools. Finish work creates the final dimensions of the stock. Lastly, the stock is sanded to remove splinters and rough texture. The first M14 stocks were made of black walnut. Beginning in 1961, yellow birch was the standard wood with black walnut as the alternate.

Some wood USGI M14 stocks have a raised shelf at the base of the firing mechanism inletting. Ferrules, the piece of metal at the very front end of the stock, on wood USGI stocks are either dimpled (round punch mark on the sides) or crimped (half-moon indentation on both sides). Standard size wood stocks were made from 1959 to 1963, possibly later depending on the drawing number. In contrast with the high degree of automation in all other production processes for the M14 rifle, the USGI wood stock makers all hand sanded every stock one at a time with a rotary sander. This was done to smooth the stock and ensure that all surfaces were true and all corners sharp. Due to naturally occurring differences in density of wood, the yellow birch and black walnut M14 stocks weighed between 34 and 38 ounces. USGI M14 wood stocks were made with steel liners fitted around the magazine well. This feature was incorporated into the T44 and T44E1 rifle designs in 1953 to prevent the stock from splitting when launching grenades. Military Standard MIL-STD-1270A(WC) is the procedure for repairing M14 and M14E2 wood stocks.

USGI Wood Stock Markings – USGI manufacturers' markings were often stamped in the butt end of the M14 wood stocks as follows: H for Harrington & Richardson, O for S. C. Overton & Co., S A for Springfield Armory, S under a half-diamond for Sykes Manufacturing and W-W for Winchester. Some wood M14 stocks have a number stamped into the wood under the butt plate, e.g., 1 or 3. It may be necessary to remove the butt plate to see the manufacturer stamping. Mathewson Tool Company and Springfield Armory made T44E4 stocks but not all are stamped with the manufacturer marking. At least some of the Springfield Armory T44E4 stocks were marked S A under the butt plate and had the DOD cartouche. The 1966 Springfield Armory inspection procedure required the M14 NM stock to be identified with the last four digits of the receiver serial number.

Wood stocks were marked with a ½ " high DOD cartouche, also referred to as a Defense acceptance stamp, on the left side near the receiver and a proof mark on the underside of the grip if they passed final ordnance inspection and proof firing, respectively. A DOD cartouche inside a circle on the left side of the butt stock near the rear sling swivel has been observed on a small number of USGI wood stocks. A smaller DOD cartouche is often stamped in the firing mechanism inletting area of Winchester M14 stocks. The proof firing stamping is a 5/16 " high letter P inside a ½ " diameter circle that is stamped on the stock on the forward side of the grip. There appear to be two types of letter P proof marks, one with a serif font P and the other with a sans serif or Arial-style P. The proof firing marking appeared on U. S. military rifles from 1873 until the end of M14 production in the 1960s.

Before final assembly, each wood stock was dipped in tung oil. The walnut stocks were dipped twice but the birch stocks only once. It was found during the first half of 1962 that two coats of oil left excessive oil and residue on the birch stocks due to that wood's different grain characteristics and slower absorption of oil as compared to walnut. Consequently, the procedure was changed to one coat of oil for birch stocks. Commercial producers of the USGI M14 rifle sprayed a stain on the birch stocks prior to the dipping in oil. This produced a color very close to that of black walnut. After several days of draining and drying, sample stocks were tested for resistance to smoke and water before the rest of the lot was approved for oil treatment and final assembly. TRW was assembling its M14 rifles with birch stocks in the fall of 1962. The last M14 rifles assembled with wood stocks left the commercial manufacturers in July 1963. Birch stocks are stronger and harder than walnut stocks. Walnut is about 10 % lighter than birch.

A few cherry stocks were made as well. Some beech M14 stocks with the selector cutout were available in the civilian market in 1973. Reportedly, the beech stocks were manufactured by Reinhart Fajen, Inc. but this has not been confirmed. Springfield Armory was not the source of the beech M14 stocks. The Armory only used walnut and birch for making M14 stocks. Wood M14 stocks will not become too hot to handle if left in direct sunlight but the preservative, tung oil or linseed oil, will be drawn out. The walnut M14 stock will burn after 1 minute 20 seconds of exposure to an open flame.

The 1984 design National Match stock (part number 9352638) can be made with the following materials: 1) black walnut 2) English walnut 3) yellow birch 4) sweet birch 5) laminated layers of black walnut 6) laminated layers of English walnut 7) laminated layers of yellow birch 8) laminated layers of sweet birch 9) sycamore 10) pecan 11) black locust 12) maple 13) red birch or 14) heat-moulded plastic. The plastic moulded stock must weigh a minimum of 2.5 pounds and have color Forest Green number 34079 per FED-STD-595.

Replacement Stocks - Most replacement USGI wood stocks will not have the proof P and DOD cartouche markings. Replacement stocks from Springfield Armory, however, were stamped with the DOD cartouche. Some of the Springfield Armory National Match M14 walnut stocks were bedded to a gage rifle. Springfield Armory National Match M14 walnut stocks were given the DOD cartouche and proof P markings. Springfield Armory shipped both bedded and non-bedded National Match M14 walnut stocks.

Winchester and Sykes Manufacturing National Match "big red" birch M14 stocks have the part number 11010263 stamped into the wood under the butt plate. A number of the Winchester stocks were also stamped with the DOD cartouche and proof P markings with some cartouches placed on the left side of the butt stock. Other Sykes Manufacturing wood stocks were stamped with the part number 7791174 on the butt end. These were replacement National Match stocks. Replacement USGI M14 wood and synthetic stocks were packaged without the hardware with the exception of the ferrule and sometimes the liner and screws for the wooden models. A square shaped piece of plastic was installed in the hinge area and two pieces of thin wood, one on either side inside the packaging, were used to protect the stock during transport and storage. The butt hinge protectors are gold or white in color and have the part number 7791050 centered on the top surface.

Around 1982, oversized stocks were allowed for competition at Camp Perry. Quickly, oversized walnut, birch and laminated wood M14 stocks became popular among military and civilian shooters. Solid wood USGI stocks are sought after for the appearance and historical authenticity. However, solid wood tends to swell or contract with changes in ambient temperature and humidity.

Laminate stocks were in use as early as World War II when Nazi Germany fielded Steyr K98 rifles with wood laminate wood stocks. Wood laminate stocks are made by gluing layers of wood together to create a rough form that could be worked into a finished rifle stock. This composition of wood and glue is very strong and resistant to impact. Yale University performed destructive testing in 1954 on wood laminate gun stock blanks. Laminated wood stocks are slightly heavier than solid wood stocks but they are more resistant to temperature and humidity fluctuations. They can be bedded just like solid wood stocks.

Reinhart Fajen began making wood gun stocks in the 1950s at his facility in Warsaw, MO (1963 address Box 338 Warsaw, MO). His craftsmanship earned a well-deserved reputation among hunters. Later on, Reinhart Fajen, Inc. purchased Bishop Stocks and grew rapidly. Reinhart Fajen produced factory issue stocks for rifle manufacturers such as Sturm, Ruger & Co. and Savage Arms Company. Reinhart Fajen Acquisition, Inc. made USGI M14 stocks in 1988 and 1990 for two U. S. Army contracts. It made three styles of M14 stocks in two materials, walnut and laminated wood. Style I was the USGI standard contour and Style III was the oversized National Match stock (USGI part number 9352638). Later-manufacture oversized National Match stocks do not have stock liners. They were made to be bedded and have been routed for the rear lug. The M14 stocks supplied by Fajen to the U. S. government for the First Gulf War were shipped to Rock Island Arsenal for cutting the selector cutout, preserving and packing before stocking in the DOD supply system.

Unfortunately, Mr. Fajen passed away in 1998 and the company struggled thereafter. Reinhart Fajen, Inc. was then acquired by the Potterfield Group. The Potterfield family made a valiant but unsuccessful attempt to turn a profit from the plant which had moved earlier to Route 1 Box 214A Lincoln, MO 65338. Manufacturing operations were suspended in Lincoln, MO by the fall of 1998. Production of stocks for other rifles was then contracted out to several companies around the United States using proprietary CNC software programs. The equipment and inventory was sold off. Boyds' bought the stock inletting equipment from Reinhart Fajen, Inc. Springfield Armory, Inc. bought half of the remaining inventory of M14 stocks and Midway USA purchased the remainder. All of the stocks, including the M14 models, quickly sold out once it was known that the Lincoln, MO plant had ceased operating. Springfield Armory, Inc. installed stocks made by Reinhart Fajen, Inc. on M1A rifles until at least January 1999.

As of 2004, Battenfeld Technologies, Inc. continued to manufacture this line of stocks for rifles other than the M14 type. Midway USA was originally started as a local gun shop in Ely, MO in 1976 by Larry and Brenda Potterfield. The business grew rapidly so that by 1983 it was strictly a mail order company. By 2007, Midway USA employed 250 people and occupied a 100,000 square foot facility in Columbia, MO. Battenfield Technologies, Inc., a product development company for the shooting sport, is headed up by their son, Russ.

**USGI M14 Synthetic Stocks**

The purpose for development of a synthetic material stock for the M14 rifle was two-fold: 1) to avoid a single supply source or single type of material for the stock and 2) to avoid the varying quantity and quality of walnut wood. As a result of testing performed in 1961, the U. S. Army Infantry Board expected that synthetic material stocks would last twice as long as those made from walnut and that pricing for the synthetic stock would compete with walnut stocks.

Experimental and production versions of the synthetic stock were fiberglass reinforced polyester plastic shell halves glued together with polyurethane foam filling in between. Experimentation with synthetic material stocks began in the late 1950s for the M14 project as at least two T44E4 rifles were fitted with black color man-made material gunstocks. James S. Lunn and others patented a reinforced fiberglass M1 Garand rifle stock in 1959. Lunn Laminates (NY) made a number of M1 reinforced fiberglass stocks. Synthetic material stocks for the M1 and M14 rifles were evaluated by the U. S. Army Infantry Board during the first half of 1960. Due to similarity with the Lunn design M1 stocks, the firm may have been involved in the 1960 development for the M14 reinforced fiberglass stock but this has not been confirmed.

General Tire & Rubber Company joined Springfield Armory in 1960 in conducting research to develop a synthetic stock for the M14 rifle. Development of this lighter, stronger stock made of fiberglass reinforced polyester plastic for the M14 proceeded in stages from 1960 until late 1965. The drawing for the final version M14 fiberglass stock is dated December 1965. Beginning in 1962, fiberglass stocks were installed on M14 rifles at the factory but it was not by Springfield Armory. The following year, Springfield Armory produced a single batch of 10,000 M14 rifles in October 1963 with synthetic material stocks.

The early synthetic material stocks had no checkering and the hole for the upper butt plate screw had a wood insert to which the wood stock upper butt plate screw was anchored. These early issue synthetic stocks were milk chocolate brown in color. At least some of these early stocks were marked on the inside of the magazine well as follows: right side top line - DM-1775-GB-2, right side bottom line - DT, left side top line - DT and left side bottom line - DM-1775-GB-1. Later-manufacture fiberglass stocks were assembled with an upper butt plate screw with a finer thread. The later upper butt plate screw is anchored to a steel nut held inside a metal bracket inside the stock. 1961 pre-production synthetic stocks were found satisfactory for mounting the M15 grenade launcher sight. If a M15 grenade launcher sight was mounted on a 1961 synthetic M14 stock, the screws had to be mounted about 1/8 " lower than what was done on the wood stock. This was to avoid protrusion of the top screw into the magazine well creating interference with fitting the receiver. This fitment issue was solved by the time the 1965 design was drawn up.

Stock ferrules on synthetic USGI stocks are either crimped or dimpled but the dimpled ferrules are not common. Military Specification MIL-S-45921A and drawing F11686427 require the ferrule to be cemented and crimped to the stock to prevent movement. Thus, it appears that dimpled ferrules are earlier production stocks. While not common, some USGI synthetic stocks were marked at the factory with the Defense Acceptance Stamp using a steel die.

The USGI M14 synthetic stock was designed and tested for ruggedness. Forty sample stocks were selected by the U. S. government representative during initial production and monthly thereafter. Any failure of any test of any sample stock meant the day's production or the represented batch was rejected.

Ten tests were conducted on each sample lot of production fiberglass reinforced plastic stocks: 1) physical examination 2) functioning firing 3) targeting and accuracy 4) adhesive and foam 5) twist 6) shock resistance 7) shock resistance endurance 8) low temperature shock resistance 9) low temperature abuse and 10) heat resistance. Some tests were conducted on all forty sample stocks, e.g., visual, functioning firing and targeting and accuracy. Most of the tests though were conducted on a portion of the sample lot. For example, twist testing was performed on five stocks and shock resistance was tested on ten stocks in each sample lot. The sample stock testing is briefly reviewed here:

Physical Examination – The sample stock was examined for proper assembly and measured for compliance to specified dimensions at several points. Both sides of the synthetic stock were tested twice each at the butt, the receiver and the forearm areas for hardness for a total of twelve readings per stock. The readings were required to average a minimum of 50 Barcol. The Barcol scale is used to measure the hardness of reinforced and non-reinforced rigid plastics.

Functioning Firing – The stock was assembled with other components to make a complete M14 rifle. The rifle was placed into a fixture to simulate offhand firing. The rifle was test fired using two full twenty round magazines in both semi-automatic and automatic using M59 or M80 ball ammunition.

Targeting and Accuracy – Again, the sample stock was made part of a complete M14 rifle and placed into a test fixture. The rear sight aperture was set at eight clicks from bottom and zero windage. The rifle sights were aligned at the six o'clock position on a target and fired for ten rounds. The results of the sample lot of forty synthetic stocks were compared to the targeting and accuracy results of forty wood stocks known to be satisfactory. The targeting and accuracy results of the synthetic stock sample lot had to equal or exceed those of the forty wood stocks to pass.

Adhesive and Foam – The stock was sectioned by cutting at a minimum of eleven specified areas along the length of the stock. The foam was examined for any presence of voids. The specific requirement was that the foam fill had to be free of voids more than 10 % of the total volume with none more than ¼ " in diameter and no more than one void per two cross-sectioned areas.

Twist – The sample stock was mounted into a test fixture and torqued to 40 ft-lbf once each in the clockwise and counterclockwise directions. The stock was visually examined for any defects.

Shock Resistance – The stock was assembled with other components to make a complete M14 rifle. The M76 grenade launcher was attached to the flash suppressor and the spindle valve turned to the horizontal (gas cutoff) position. The rifle was placed into a fixture. With the toe of the butt stock at 45 degrees, five practice anti-tank grenades were launched using M64 grenade cartridges. The sample stock was then removed from the rifle and examined for any defects or signs of damage.

Shock Resistance Endurance – Three of forty stocks in each sample lot were selected for this test. It is performed in the same manner as the shock resistance test but 100 rifle grenades are fired instead of five using each sample stock.

Low Temperature Shock Resistance Test – This test was performed just like the shock resistance test except the rifle was kept at – 65 degrees Fahrenheit + or – 5 degrees for three hours before and then during the test.

Low Temperature Abuse Test – The sample stock assembled into a complete M14 rifle was stored at – 65 degrees Fahrenheit + or – 5 degrees for three hours then dropped from a height of 3 feet on to a hardwood bench. The test was repeated so that the stock would impact at different points (left side, right side, and butt stock toe and heel) on the bench. After this, the rifle was allowed to swing 90 degrees by its own weight from a horizontal position, while held at the muzzle, so that the stock would hit the flat side of the hardwood bench. This was repeated so top, bottom and both sides of the stock impacted the side of the bench.

Heat Resistance – The sample stock was assembled into a M14 rifle with the bolt, firing mechanism and operating rod spring removed. The test rifle was placed in a stand to hold it in the horizontal position. A 115 Volt AC, 1000 Watt heating rod with an effective heating length of 24 " was placed inside the barrel. The heating rod was connected to a variable voltage control. A thermocouple was attached to the top of the barrel about 10.5 " from the end of the muzzle. The thermocouple was wired to a pyrometer to indicate the barrel temperature during the test. By increasing the voltage applied to the heating rod in stages, the rifle barrel temperature was brought up to 1200 degrees Fahrenheit. At that point, electric current flow through the heating rod was stopped and the barrel cooled to ambient temperature. The stock was then examined for any damage.

USGI M14 synthetic stocks have the letters DT as well as other alphanumeric characters in the magazine well area. A small gap between the middle portion of the receiver and the stock is normal for USGI wood and synthetic M14 stocks, but is more noticeable on many fiberglass stocks. The USGI synthetic M14 stock itself weighs 34 to 36 ounces. A USGI M14 synthetic stock with all the correct metal hardware weighs in at about 46 ounces. The USGI M14 synthetic stock will become too hot to hold if left outdoors for as little an hour in the direct sun. If the synthetic stock is brought into the shade for two minutes or more, it will cool sufficiently to be comfortable to handle. The USGI M14 synthetic stock will burn after 2 minutes 10 seconds of exposure to an open flame. Both wood and synthetic M14 stocks are strong enough to break the operator's fall to a prone shooting position from a run. Each type of stock will withstand fifty vertical butt strokes against a test dummy but will suffer damage in less than fifty horizontal butt strokes against the same butt stroke dummy. The damage is likely to occur in the firing hand grip area of the stock. USGI M14 synthetic stocks have always been allowed for competition at Camp Perry.

USGI synthetic M14 stocks were made as late as 1968. The U. S. Army awarded a contract to General Tire & Rubber Company in 1968 for 500,000 synthetic M14 stocks to be used as replacement stocks. At about $2,187,000.00, the February 1968 contract was the single largest known dollar amount awarded for production of a M14 rifle part ever. According to an employee working at the lab during the period, a product improvement program had been written up for the M14 synthetic stock at the General Thomas J Rodman Laboratory at Rock Island Arsenal in the early 1970s. In 1972, the Army reorganized the arsenal system. As part of the reorganization, the Rodman Laboratory staff was reduced from 125 employees to a skeleton crew of twenty-one. The M14 stock improvement program never went any further.

**USGI M14E2 Stocks**

The M14E2/M14A1 rifle was fitted with a walnut or birch straight-line stock. At least one laminate wood M14E2 stock was made and it was issued for service. At least 10,350 M14E2 stocks were made in the 1960s. At least 8,350 M14E2 stocks were produced in 1963 and 1964 and another 2000 or better about 1967 or 1968. The first M14E2 stocks were made in late 1963. Most of the M14E2 stocks were made of birch at Canadian Arsenals Limited in Long Branch, Ontario, Canada in 1964 to support the M14E2 conversion project at Springfield Armory.

Canadian Arsenals Limited produced Browning pistols, Sten submachine guns and other military equipment during and after World War II. In 1986, the Canadian government privatized its Crown corporation, Canadian Arsenals Limited, by sale to the SNC Group for $Cdn 92,000,000. By 2001, SNC Group was known as General Dynamics Ordnance and Tactical Systems-Canada, Inc. Long Branch is a suburb of Toronto.

The few walnut M14E2 stocks were made at Springfield Armory, Rock Island Arsenal and Anniston Army Depot. Springfield Armory walnut M14E2 stocks have the DOD cartouche but Canadian Arsenals birch M14E2 stocks do not. Winchester made at least one cherry M14E2 stock. Sykes Manufacturing also made birch M14E2 stocks, presumably under contract for Springfield Armory. An additional 2,000 or more M14E2 stocks were produced around 1967 or 1968 but without the fore grip and butt plate assemblies. This latter batch of stocks was released around 1978 or 1979. These M14E2 stocks were sold with commercial reproduction fore grip and butt plate assemblies. The reproduction M14E2 butt plate bracket assemblies were made by casting.

In 1971, surplus parts dealer Pete Michaels (Batavia, IL) bought more than 3,000 M14A1 stocks without hardware and more than 200 M14A1 stocks with hardware. Springfield Armory, Inc. sold M14E2 birch and walnut stocks before 1994. Jack Dailey, owner of Fred's (Ramseur, NC), was the winning bidder in 2000 on a U. S. government auction of 2,701 M14E2 stocks.

The USGI M14E2 stock has a selector cutout, rubber and steel recoil pad, smooth surface flip up butt plate, a pistol grip and rubber coated aluminum fore grip. The fore grip locks into place when in use. It retracts and swings upward towards the operator by pulling on a latch on the rear side of the grip. The position of the fore grip is adjustable. A medium weight or heavyweight M14 barrel will fit in an M14E2 stock with no problems.

**Commercial Synthetic Match Grade Stocks**

McMillan Fiberglass Stocks, Inc. – As a boy, Gale Alvin McMillan became an excellent marksman by hunting rabbits to help provide food for the family. He became a bench rest competition shooter in 1958 and enlisted in the U. S. Air Force the same year. During ten years of military service, Gale McMillan shot competitively and worked on rifles for other competitors. After the service, he settled in Phoenix, AZ and was employed in the plastic mold making industry. He applied his knowledge and experience to start making fiberglass rifle stocks in 1973. He started his own company in 1975 producing fiberglass rifle stocks and building rifles. Around 1986 or 1987, McMillan Fiberglass Stocks began using CNC machine tools in its manufacturing operation. Through the years, Gale was assisted by his wife, Gloria, and other family members in the day-to-day operations of the business. In 1987, their sons Kelly and Rock, bought and took over the stock making business. Sadly, Gale McMillan succumbed to cancer on May 29, 2000. McMillan Fiberglass Stocks, Inc. has brought many creative designs to the gunstock market.

McMillan Fiberglass Stocks developed its M1A stock in the 1980s to meet the request from the U. S. Marine Corps for a more durable M14 stock. Around 1987, the McMillan M1A stock design was changed to lengthen the grip and eliminate the stock liner screw depressions. In the present day, McMillan makes three models of fixed butt stock synthetic stocks for the M14 type rifle, M1A, M2A and M3A. The obvious difference between the three models is the grip style but they all must be bedded to the rifle's receiver and firing mechanism before use. These stocks can be fitted with or without a steel liner. The M2A and M3A models have adjustable cheek pieces. The McMillan M1A stock is a traditional design sized for heavy barrel M14 type rifles and is the most common choice of stock for U. S. Army M25 rifles. McMillan M2A stocks have been fitted on M25 rifles for the Army 10th Special Forces Group and M14 DMR rifles for the U. S. Marine Corps. The U. S. Navy SEALs built its M14SSR rifles with McMillan M3A stocks. The M2A and M3A stocks are not allowed to compete as Service Rifles per the rules for Director of Civilian Marksmanship and NRA High Power Competition matches, but may be used in NRA High Power Rifle competitions as a Match Rifle (a class usually populated by shooters using bolt action rifles).

Bell and Carlson - Bell and Carlson is a designer and manufacturer of synthetic material rifle stocks. It offered a M14 rifle stock in 2005 and 2006 in its special purpose line of stocks (catalog number C190). The stock was built with structural urethane, aramid, graphite and fiberglass in a choice of seventeen finishes. The stock accommodated a heavyweight contour barrel and the magazine well was flared to facilitate quick magazine changes.

Warbirds Custom Guns - In November 2007, Warbirds Customs Guns made available a mixed material match style stock for the M14. These stocks were made of fiberglass with an internal aluminum skeleton from the receiver area to the fore end. Options included a metal stock liner and inletting for a receiver rear lug. Stocks without the liner required bedding behind the receiver lets in order to provide a recoil bearing surface. The stocks were sold with a lifetime warranty as long as any adjustments or modifications were done by Warbirds Custom Guns. The Warbirds Custom Guns M14 stock had a semi-target pistol grip, weighed just under 3 pounds and was available in a choice of colors.

**Folding and Telescoping Commercial Stocks**

Folding and telescoping design stocks have been commercially available for the M14 type rifle since at least 1978. States such as California, Connecticut, Massachusetts and New York prohibit or regulate installation of folding or telescoping stocks on semi-automatic centerfire rifles capable of accepting a detachable magazine, e.g., M14 type rifles. There may be other states and municipalities with restrictions on the installation of folding or telescoping stocks. Consult state and local laws before installing these stocks.

When purchasing a folding or telescoping stock for the M14 type rifle, the end user should determine what features and capabilities are important for its intended use. The following criteria should be evaluated for each model when selecting a high end commercial M14 stock: 1) ability to use iron sights 2) available rail space over the receiver 3) adjustment of the butt stock length-of-pull 4) ease of field stripping 5) ability to accommodate different barrel contours 6) flexibility in mounting night vision and daylight optics and other accessories (flashlight, vertical fore grip, etc.) 7) accuracy enhancement 8) receiver-to-stock fit including the ability to accommodate select fire components 9) balance of the rifle when fully configured and 10) operator comfort.

1978 Commercial M14 Folding Stock – About 1978, Wayne Young (then 4723 Marino Street Columbus, GA) manufactured and sold a BM59 Alpine style folding stock for the M14 type rifle. He sold ninety-eight of these high quality M14 folding stocks. The folding butt stock mechanism was fabricated by arc welding steel tubes and steel plates together. The upper horizontal tube of the butt stock was 0.9 " in diameter. The folding butt stock was phosphate coated then covered with several layers of black color vinyl. The thick vinyl covering of the wide upper bar made a firm and comfortable cheek weld possible. The butt stock was folded to the right side by pushing a friction latch, on the left side of the stock, outward from the stock and moving the butt stock to the right. The folding butt stock mechanism was mated to a modified M14E2 stock subassembly behind the receiver heel. The folding stock weighed 3.2 pounds. Length of pull for the folding stock was 14 ". With the butt stock folded, the overall length for a 22 " barreled rifle was 36 ". Thomas A. Buss, a surplus small arms parts dealer hailing from Springdale, PA, bought eighty of these folding stocks. The remaining stocks were sold to various individuals.

Springfield Armory, Inc., Reese Surplus, Inc., Choate Machine & Tool, Inc. and Vltor Weapons Systems - Choate Machine & Tool, Inc. (Bald Knob, AR) began operation in 1972. Choate Machine & Tool produces gun stocks and other firearms accessories. In early 2005, the company had begun development on a new design pistol grip folding stock for the M14 type rifle.

Springfield Armory, Inc. offered commercial M1A-A1 folding stocks in the 1980s and early 1990s. The company made three versions of the M1A-A1 folding stock. The first version was either a modified M14 or a modified M14E2 stock. These stocks were cut just behind the receiver well, where a Beretta BM59 Alpine metal butt stock was added. These BM59 butt stocks had butt plates with a rubber pad on the upper half of the butt plate and two braces for supporting the butt plate. The first version M1A-A1 stock often used a modified M14 stock and had a Beretta BM59 plastic pistol grip added to it, rather than starting out as a M14E2 stock. The plastic pistol grip had a storage space accessed by a metal cover on the bottom. The first version of the M1A-A1 stock may or may not have the selector cutout because it originated as a USGI stock. M1A serial number 0663XX, built in the fall of 1991, was assembled with a Beretta BM59 Alpine folding stock mated to a commercial walnut stock and Beretta BM 59 plastic pistol grip with the metal cover.

The second version of the Springfield Armory, Inc. folding stock has the same BM59 butt stock folding mechanism as the first version but does not have the lower butt plate supporting brace. It has a hardwood pistol grip and full length rubber butt pad. The butt pad itself will fold up against the single metal brace. On the second version, the supporting brace, butt pad assembly, and hardwood pistol grip were commercially manufactured parts. The second version M1A-A1 folding stock was made with either a modified BM59 stock or a USGI M14 stock. If a modified BM59 stock was used there will be no selector cutout and the front end sling swivel was left on the left side. If a M14 stock was used to build this version of the folding stock, the selector cutout and front end bottom side sling swivel were left as is. This version is still available from Reese Surplus, Inc. (Colona, IL) as a modified Beretta BM59 folding stock fitted to the M1A or M14. Reese Surplus has sold this version in the past with a M14 wood stock as the base for the assembly.

Springfield Armory, Inc.'s third version of a M1A folding stock was a Choate Machine & Tool, Inc. plastic butt stock folding arm with steel hinge, mated to a truncated USGI M14 stock. The folding arm mechanism was attached by two large screws to either a M14E2 stock without the selector cutout filled in or a synthetic M14 stock with an added synthetic pistol grip and the selector cutout filled in. The third version synthetic material folding stocks were black color with a textured surface and a full length rubber butt pad. This type of folding stock was assembled to M1A serial number 081239 in mid-1994 at the factory. The inside of the butt plate on the Choate Machine & Tool folding arm was marked as follows: first line – CHOATE TOOL CO. second line – BOX 218 third line – BALD KNOB, ARK. fourth line – 72010. Springfield Armory, Inc. sold the third version folding stocks as late as 1999 with the instruction that they were to be installed on rifles assembled prior to September 13, 1994, in compliance with the 1994 Assault Weapons Ban still in effect at that time.

In 2005, Springfield Armory, Inc. introduced the M1A SOCOM II LE model. This rifle was fitted with a VItor Weapons Systems M14 Modstock. The VItor M14 Modstock (model number M1S-1) was a collapsing butt stock and pistol grip mated by a machined aluminum adapter to a USGI reinforced fiberglass M14 stock. The VItor M14 Modstock could be raised or lowered 1 " in height for better alignment between the shooter's eye and any mounted optical sight. The height of the M14 Modstock could be adjusted by loosening, moving up or down, and then tightening a 3/8 " hex head bolt at its front end.

The five-position collapsing butt stock allowed the length of pull to be adjusted from 10.5 " to 14 ". The butt stock had ambidextrous connections for installing a sling swivel. Both the butt stock and pistol grip had storage compartments. The Vltor M14 Modstock was available in black, flat dark earth (tan) or olive drab green. It could not be fitted to select fire M14 type rifles as the selector cutout was filled in. The right hand side of the aluminum adapter is laser engraved with a code and serial number. As an option, the Vltor collapsing butt stock assembly could be replaced with its fixed length A1 Modstock. The Vltor pistol grip could also be swapped out for other makes of M16 style grips.

SparrowHawk Stocks - In the fall of 2003, SparrowHawk Stocks introduced the M-14CM4 stock to the market. The M-14CM4 stock is the mating of a M16 type four-position telescoping stock and pistol grip to a synthetic M14 stock for use on M14 type rifles where allowed by law. State and local law may allow installation of this stock if the butt stock is fixed and a muzzle brake is permanently installed. Consult state and local laws before installing this stock. A lower front hand guard and M1913 Picatinny style accessory rails are optional. Colors available were black, white, olive drab and earth brown.

Rock SOPMOD M14 Stock - The Rock SOPMOD M14 had a telescoping stock. The alloy aluminum stock body was attached to a titanium six-position collapsible rail butt stock and adjustable cheek rest. Length of pull from the rear of the butt stock to the pistol grip was approximately 11 " when fully extended. This was designed to accommodate operators wearing body armor. The telescoping stock extended and retracted with the push of a button at the end of the stock behind the receiver heel. The stock had ambidextrous sling swivel studs. The stock color was usually black.

Troy Industries Telescoping M14 Stock Project - LAW483 Enterprises designed the Drop-In Modular Battle Stock for Troy Industries. Troy Industries had a prototype Drop-In M14 Battle Stock on display at the 2004 SHOT Show. The prototype stock was made of fiberglass and incorporated a magazine well with an opened up lengthwise dimension, making magazine insertion much easier. The enlarged magazine well also resulted in a hump-like area just in front of the magazine well, providing a grip point on the stock. The Drop-In M14 Battle Stock prototype had a telescoping M16 type stock that also folded to the left side, an M16 type grip with a textured surface and ambidextrous sling swivel studs. The prototype model had M1913 Picatinny style rails at the three, six and nine o'clock positions on the fore end. The company then expressed plans to add a twelve o'clock rail to the production model.

By the fall of 2004, the M14 Drop-In Modular Battle Stock had been further refined and reclassified as the M14 Modular Stock System (MSS). The M14 MSS was a drop in stock with no replacement of parts needed other than the stock and hand guard. It was designed to fit all standard configuration M14 type rifles and be modified to accept other M14 type models. The stock body was machined from bar stock T6 alloy aluminum and hard coat anodized to military specifications in a choice of black, green, or tan colors. The design called for a six-position collapsible and side folding M16 carbine style butt stock. The butt stock assembly was to have modular storage compartments and a sling swivel on the top edge at the rear end. Further, the M14 MSS included a full M1913 Picatinny rail system with a full length bottom rail, 6 " side rails and a detachable top rail. The side and bottom rails were to be supplied with rail covers. The detachable top rail ran from the front band to just in front of the rear sight aperture. All rails featured numbered cross slots and sported military specification ¼ " x 20 threaded holes. The Troy Industries M14 modular stock weighed less than 3.5 pounds.

Several design changes were made in the M14 MSS project in 2005. Consequently, it made sense to rename the M14 stock project. Troy Industries introduced its Compact Battle Rifle Stock (CBRS) at the Tactical Response Expo on August 30 and 31, 2005 in Chantilly, VA. As introduced in August 2005, the CBRS consisted of a 2.5 pound stock assembly and a 1.9 pound M1913 Picatinny rail assembly. Both assemblies were made of alloy aluminum and available in either black or dark earth (brown) PTFE finish with matching pistol grip and rail covers.

By May 2006, the CBRS was renamed the Drop In Stock System (DISS). The M14 DISS was designed to duplicate the ergonomics of the M16A4 carbine. Consequently, no cheek rest was needed for this stock with optical scopes and sights. The M14 DISS stock assembly was shaped to accommodate standard, medium weight and heavyweight barrels and the M14 select fire components. The stock assembly included a Vltor Weapon Systems six-position collapsing M16 style butt stock with storage compartments. A removable plate could be attached to the side of the stock whether or not a selector cutout was present. The stock assembly had adjustable and locking mechanical bedding at the trigger guard, operating rod guide and the gas cylinder. These features allowed the stock to be tensioned for improved accuracy because the barrel harmonics remained consistent with each shot fired.

The M14 DISS was removed and installed just like a USGI M14 stock. The operating rod guide did not need replacement. The Vltor collapsing butt stock could be replaced with Ace stocks and adapter blocks to create a left-hand or right-hand folding stock. The top rail required removal of the rear sight assembly, but not the cartridge clip guide, to allow installation of the rail assembly. The twelve o'clock rail attached to the rear sight pocket and the barrel with a V-shaped block assembly. A different V-shaped block assembly was used for medium weight and heavyweight barrels. The top rail ran from the front band back to the rear sight. The rail assembly had three, six and nine o'clock M1913 Picatinny rails as well. The six o'clock rail was 12 " long.

By October 2006, Steve Troy took the decision to return to the term SOPMOD because Troy Industries brought the SOPMOD M14 to the market and that product is identified with the firm in the M14 rifle community. The Troy modular M14 stock was then coined as the Troy SOPMOD M14 Modular Chassis System or Troy MCS for short. In October 2006, the pre-production model was marked on the left side at the magazine well as follows: top line - TROY SOPMOD M14 middle line - MODULAR CHASSIS SYSTEM bottom line - CAGE CODE 311EZ. A semi-automatic only M14 rifle fitted with an October 2006 pre-production Troy SOPMOD M14 Modular Chassis System, Magpul M93B collapsing butt stock, EOTech dot sight, Troy Industries back up iron sights and a full magazine weighed in at 12 pounds.

The exploded parts diagram for the production version of the Troy M14 MCS was dated March 29, 2007. A Troy MCS stock manufactured in July 2007 was marked as follows on the upper rail left side: top line - TROY M-14 MODULAR CHASSIS SYSTEM middle line - CAGE CODE 3EZ11 P/N MCS-14 PATENT PEND. bottom line - WWW.TROYIND.COM. The lower rail right side was marked: top line - TROY M-14 MODULAR CHASSIS SYSTEM middle line - CAGE CODE 3EZ11 P/N MCS-001 PATENT PEND. bottom line - WWW.TROYIND.COM.

Troy Industries began shipping the stock to retail customers in May 2007. Due to the variety of commercial products available for the M16 family, the Troy M14 MCS was not supplied with a butt stock or pistol grip. It was a true drop-in modular stock for the non-receiver lugged M14 type rifle with any barrel contour up to and including USGI heavyweight match grade. The Troy MCS was offered in black or flat dark earth colors. The Troy M14 MCS had three, six, nine and twelve o'clock M1913 Picatinny rails. The twelve o'clock rail had an impressive fifty-four rail slots.

The upper half of the assembly was secured to the rifle by use of a barrel band clamp at the front end and a M16 type push pin at the rear end. The barrel band clamp was made from two machined aluminum halves surrounding the barrel and gas cylinder just behind the front band. The two halves of the barrel band clamp were secured by four hex head screws. The rear sight assembly was removed to clear the rear sight pocket for the twelve o'clock rail. Two hex head screws were threaded through the rear sight knob holes to secure the twelve o'clock rail at the rear. The M16 receiver style push pin was inserted through a hole on the right side just behind the receiver heel to secure the lower half to the upper half of the assembly. A cover plate was placed in front of the front band and secured by three hex head screws to the lower and upper halves of the MCS. The Troy MCS was made to be compatible with all M16 type butt stocks except thumbhole models. Field stripping the Troy MCS stock was accomplished by removing the firing mechanism and pushing the M16 receiver style push pin outboard to release the lower half. The upper half remained attached to the barreled action for maintenance.

Some stock weights are provided for comparison purposes:

USGI M14 birch stock with hardware but no hand guard assembly - 2 pounds 11 ounces
USGI M14 synthetic stock with hardware but no hand guard assembly - 2 pounds 14 ounces
USGI M14E2 birch stock with hardware but no hand guard assembly - 3 pounds 6 ounces
Troy M14 MCS assembly with no pistol grip, fore grip or butt stock - 3 pounds 12 ounces

Depending on the make and model of butt stock, vertical fore grip and pistol grip used, the fully outfitted Troy M14 MCS assembly weighs 1 to 2 pounds more than a USGI M14 synthetic stock with hardware.

Sage International, Ltd. – Sage International, Ltd. began operations in 1973. Mr. John Klein is the owner and President of the company. Its modern manufacturing facility boasts extensive machining and welding capabilities. Sage International, Ltd. makes rifle and shotgun accessories, vehicle gun racks and inspection mirrors.

The idea for the M14 Enhanced Battle Rifle began in 2000 with some U. S. Navy SEALs from the Atlantic Fleet looking for a compact M14 rifle for arctic operations. The project request was assigned to Naval Surface Warfare Center (Crane, IN). David P. Armstrong worked on this new M14 rifle project. He first modeled the M14 EBR stock by starting with the telescoping mechanism sold by Sage International, Ltd. to NSWC Crane for use on the Remington 870 shotgun and adding it to a USGI M14 fiberglass stock.

Other modified USGI M14 stocks were submitted to the U. S. Navy SEALs for evaluation. These experimental M14 stocks included: 1) a Butler Creek side folding model 2) a telescoping M16 carbine stock assembly mated to a modified USGI M14 synthetic stock and 3) a cut off M14E2 stock with a M2 bipod leg and rubber butt pad added to the rear. The Navy SEALs preferred the Sage International telescoping shotgun stock modification from among those submitted for evaluation. The Navy SEALs requested a cheek rest be developed for the compact M14 design as the original modified Sage model did not have one. Due to feedback provided by the U. S. Navy SEALs, several USGI M14 synthetic stocks were modified with Sage International Remington 870 telescoping butt stocks, assembled to M14 rifles with 22 " barrels and issued for use. Additionally, two experimental prototype M14 rifles were fitted with the Sage telescoping modified USGI synthetic stocks but given 18 " heavyweight barrels, custom made accessory rails and a prototype quick detaching sound suppressor. A standard model Knight's Armament Company RAS-14 rail system was added to a M14 rifle fitted with one of the Sage telescoping modified USGI synthetic stocks in a brief experiment. The M14 EBR concept blossomed from that point onward to include accessory rails.

NSWC Crane designed a stock chassis in the summer of 2002. The task of manufacturing prototype M14 EBR stocks for evaluation was then assigned to Sage International, Ltd. The firm initially considered making the stock body out of plastic by injection molding but settled on an alloy aluminum design. A highly modified form of the original Sage telescoping shotgun butt stock was added to the stock chassis to create the first design M14 EBR stock. The 2002 design modified telescoping butt stock included a cheek rest. The stock chassis included weight lightening machine cuts and full length six and twelve o'clock Picatinny accessory rails. The USGI cartridge clip guide was replaced with a Picatinny rail strip for mounting of a scope ring.

Sage International, Ltd. debuted the M14 EBR stock for the public at the 2003 SHOT Show in Orlando, FL. Subsequently, Mr. Armstrong patented the M14 Enhanced Battle Rifle (EBR) stock. Mr. Armstrong was the In-Service Engineering Agent for the Mk 14 project at the Weapons Branch, Weapons Division, Ordnance Engineering Department at NSWC (Crane, IN).

NSWC Crane let a bid for the M14 EBR stock on May 11, 2004. The five year contract was awarded to Sage International, Ltd. The Sage International M14 EBR stock was a steel wire telescoping pistol grip stock with adjustable polycarbonate cheek piece and adjustable butt pad. The stock body was CNC machined from 6061-T6 aluminum-magnesium alloy billet. This alloy is commonly used to fabricate items such as aircraft and electrical fittings and bicycle frames. The M14 EBR stock had ambidextrous sling swivels and four military standard M1913 Picatinny rails around the barrel and one behind the receiver heel. It was designed to fit a M14 type rifle with a standard contour and medium weight barrels. The Fulton Armory medium weight barrel had been contoured to fit in between the two hand guard screw bosses in the EBR stock. The M14 EBR stock was not made to fit heavyweight barrels.

The standard size operating rod guide was replaced with an operating rod guide supplied by Sage International, Ltd. The operating rod guide was attached to the stock with three screws. Once that was done, it was a matter of reassembling the rifle with the stock bolted to the new operating rod guide and replacing the traditional front band with a washer to align the gas cylinder to the barrel. The M14 EBR stock operating rod guide was machined from AISI 4130 alloy steel. The M14 EBR stock top rail could be taken off by removing six screws. The M14 EBR stock was built with a barrel tensioning screw located at the front end of the top (twelve o'clock) rail. Earlier models of the stock utilized a lock nut and later models had a setscrew to keep the tensioning screw from backing out. The barrel tensioning screw was adjusted to eliminate vertical stringing during rapid fire. The tensioning screw was not utilized during U. S. Navy acceptance testing of the Mk 14 Mod 0 rifle. Sage International, Ltd. also made a M1913 Picatinny rail clip guide for anchoring a scope or dot sight. The clip guide base could be used in conjunction with its stock for mounting optics.

Sage International, Ltd. (Oscoda, MI) has produced M14 EBR and M14 Chop Mod stocks for the U. S. military and for domestic and foreign commercial markets. The Sage International EBR stock has seen service on M14 rifles in use by U. S. Army soldiers in Afghanistan. As of November 2006, at least one Sage International M14 EBR stock was fitted to a T57 rifle in the Taiwan Army. That particular T57 had the selector lock installed and was fitted with a traditional design rifle scope.

In late November 2004, Sage International produced an unknown quantity of upgraded M14 EBR stocks for the U. S. Navy SEALs for evaluation. The specification for this developmental stock was supplied by Naval Surface Warfare Center at Crane, IN. This upgraded second generation version of the M14 EBR stock was named "Chop Mod." It was intended to lighten the weight of the U. S. Navy Mk 14 Mod 0 rifle. NSWC prototype Chop Mod stocks were created by cutting a section of the fore stock out and then welding the front end back on to the remaining body. The Chop Mod stock is a lighter weight non-reflective anodized gray color version of the M14 EBR stock. Twenty-five extra holes are drilled in the frame, rails and butt stock/pistol grip mount to reduce the weight. Additionally, the top rail is 11.25 " long or 1.75 " shorter than the original M14 EBR stock. The side rails are 1.60 " shorter than the original black color M14 EBR version. The shortening of the accessory rails further reduces the stock weight. Consequently, the Chop Mod stock weighs four ounces less than the original M14 EBR model. The six-position steel wire butt stock runs through a sturdier butt stock/pistol grip mount that is fitted with a new internal metal support tab. The side of the Chop Mod stock is marked on the right hand side below the operating rod rail from top to bottom: first line – EBR CHASSIS STOCK second line – SAGE INTERNATIONAL, LTD third line – Oscoda, Mi 48750 Patent Pending. The stock inscription was done with dot matrix style lettering for all stocks produced in November 2004.

During the November 2004 batch production run of M14 Chop Mod stocks Sage International, Ltd. also made twenty-five of these lightened anodized gray color M14 stocks but with a 13 " full length top rail like the original black color M14 EBR stock model. This single lot of twenty-five stocks was released by Sage International through authorized distributors to the civilian market. Beginning in the winter of 2005, all Sage International M14 stocks available to the civilian market have the same features as this single lot of twenty-five gray color M14 stocks except smooth lettering is used for the manufacturer's inscription. The Chop Mod version is used on the U. S. Navy Mk 14 Mod 0 rifles from the end of 2004 onward. Before production of the original M14 EBR stock ceased in January or February 2005, a number of black EBR stocks were produced with the shorter Chop Mod side rails and smooth lettering inscription described above. The Sage M14 Chop Mod stock has also been produced with an anodized coyote brown finish.

Sage International, Ltd. introduced its Mk14 Mod 0 CQB stock at the 2005 SHOT Show in Las Vegas, NV. This model was a M14 Chop Mod stock fitted with a collapsible M16 carbine style butt stock. These stocks became available to the commercial market in April 2005. They were available in black or gray and reduced the weight by 1.1 pounds over the M14 Chop Mod stock. A vertical fore grip that attached to the bottom rail was a factory option. A California legal version of the Sage International M14 stock was available to the public by March 2005. This version had a fixed synthetic black overmolded Hogue shot gun butt stock with sling plate, butt pad, and top, bottom and side rail mounts but no pistol grip. LAW483 Enterprises offers two standard grip butt stocks for the Sage International, Ltd. M14 EBR stock, 11.5 " and 13.25 " length of pull. LAW483 modifies Hogue shot gun butt stocks to achieve the desired length of pull. The Hogue overmolded shot gun butt stocks feature a good quality recoil pad and textured grip.

In December 2006, Sage International produced the first batch of its third generation M14 stock, the Sage CQB SEAL model. This stock had dark earth (medium brown) color plastic parts: vertical fore grip, pistol grip, hand guard, and triangular frame collapsible butt stock with removable cheek rest. The magazine well has been redesigned to further reduce the overall weight. The side rails have been lengthened and the top rail changed to allow installation of a M14SE barrel. All of these components with the stock chassis total 4 pounds 9.2 ounces in weight. The chassis body has a dark earth anodized coating. The Sage CQB SEAL stock will accept a medium contour barrel without modification. This model was 1.25 " shorter than the first generation M14 EBR stock when both were fully extended and 2 " longer than the first generation M14 EBR stock when both were fully collapsed. Eleven or twelve of the Sage CQB SEAL stocks were released to the civilian market in early 2007. In June 2008, the color of the stock chassis was changed to a lighter shade of gray.

The Sage M14 EBR stock for the U. S. Marine Corps was released for limited sale in the civilian market in October 2007. This model had a light chocolate brown color. The stock twelve o'clock rail was factory modified at the rear end to accept a side three point scope mount. The Sage operating rod guide was changed so that it would fit a Smith Enterprise, Inc. M14SE medium weight barrel. This Sage stock model was marked as follows on the right hand side: top line - EBR CHASSIS STOCK middle line - SAGE INTERNATIONAL, LTD bottom line - Oscoda, MI 48750 Patent 6839998. The U. S. Marine Corps designated the M14 configured in this stock as the M39 Enhanced Marksman Rifle (EMR) in October 2007. Collapsing rail or buffer tube butt stocks can be installed on both variations of the CQB stock and the M39 EMR model stock.

The Sage International, Ltd. M14 stocks have gone through a developmental evolution. The chassis style defines the stock version even though the butt stocks are interchangeable between different models. The Sage International, Ltd. M14 alloy aluminum chassis stock is an approved alteration for the USGI M14. To summarize the evolution of the Sage International, Ltd. M14 stocks associated with modern military versions of the M14 rifle, the following sequence of product development is offered:

Early First Generation - 1) full length forestock terminating at the gas cylinder 2) ribbed and very straight chassis bottom from the rear end to the magazine well 3) lack of radial holes in the magazine well 4) lack of rail grooves.

Late First Generation (early Mk 14 Mod 0) - 1) full length forestock 2) slightly curved chassis bottom from the rear end to the magazine well 3) rail grooves 4) lack of radial holes in the magazine well 5) welded rail brackets.

Early Second Generation (late Mk 14 Mod 0) - 1) full length forestock 2) slightly curved chassis bottom from the rear end to the magazine well 3) rail grooves 4) six radial holes in the magazine well 5) lack of welds on the rail brackets.

Late Second Generation (Mk 14 Mod 1 and M39 EMR) - 1) chopped length forestock 2) moderately machined chassis bottom from the rear end to the magazine well 3) rail grooves 4) six radial holes in the magazine well 5) lack of welds on the rail brackets or fitted with a M4 style butt stock extension tube.

Early Third Generation - 1) chopped length forestock 2) heavily machined chassis bottom from the rear end to the magazine well 3) moderately machined pistol grip area 4) rail grooves 5) six radial holes in the magazine well.

Late Third Generation - 1) chopped length forestock 2) heavily machined chassis bottom from the rear end to the magazine well 3) heavily machined pistol grip area 4) rail grooves 5) six radial holes in the magazine well.

The top covers for the standard barrel use six screws. One of the screw holes was omitted for the medium weight barrel top covers due to the wider barrel profile.

Marstar Canada - Beginning in January 2007, Marstar Canada was offering a Canadian manufactured alloy aluminum chassis stock for the M14 rifle (catalog number M14-105). The M14-105 was machined with three, six, nine and twelve o'clock Picatinny rails and had an anodized black finish. The stripped chassis weighed 4.5 pounds and did not have a selector cutout.

LAW483 Enterprises - By the fall of 2004, LAW483 Enterprises offered two folding stocks. The Drop-In Modular Battle Stock was a folding and collapsing stock model. It had Picatinny rails at three, six and nine o'clock, a proprietary enhanced magazine well for easier insertion, and proprietary fore end texturing with a choice of either bottom or side sling swivels. The highly modified USGI M14 synthetic stock utilized a M16 carbine type collapsible butt stock and M16A1 style pistol grip. Its BSR Folding Stock mated a Beretta BM59 folding mechanism to a modified USGI M14 synthetic stock. The BSR Folding Stock was formed to follow the contours of the USGI M14 wood stock and given a front end side sling swivel. BSR stood for Beretta Springfield Reese because this stock would fit the folding mechanisms offered by those three manufacturers. Filling of the selector cutout, various grades of surface texturing, single point sling attachment, and camouflage pattern painting were additional options for either stock. These stocks were no longer available as of 2006. The LAW483 M14H6 stock debuted at the 2009 SHOT Show in Orlando, FL. This was a drop-in fiberglass stock with a fore end suited for adding rail mounts. The grip of the M14H6 stock was more vertical than a USGI M14 stock. LAW483 Enterprises continues to expand its selection of M14 stocks. To this end, the business added a Terrco Northstar 20-2R Duplicarver and a milling machine to its capital inventory in 2009.

McMillan Fiberglass Stocks, Inc. – McMillan Fiberglass Stocks completed its first production run of folding MFS-14 stocks in October 2004. The McMillan Fiberglass Stocks tactical MFS-14 stock used a six-position M16 carbine style padded butt stock that was attached to a folding mechanism mounted to a modified M2A stock. The butt stock folded to the receiver left side which allowed for firing while folded. When extended, it locked positively and only required a tug to release. The sling swivel was located on the right side of the stock just above the pistol grip. The McMillan tactical MFS-14 stock had three different fore end rail configurations. One rail configuration covered the barrel from the barrel ring to the front band and the front 4 " or so at the fore end at the three, six and nine o'clock positions. Another rail arrangement extended the six o'clock rail forward to accommodate a bipod and the third configuration extended the twelve o'clock rail to the rear. The MFS-14 stock required bedding for installation.

Accuracy International, Ltd. - At the 2008 SHOT Show in Las Vegas, NV, Accuracy International displayed its prototype aluminum chassis folding stock for the M14. It had an adjustable stock comb and thumbhole grip. The paint finish was mostly tan with a little brown. Availability was anticipated for later that year.

**Other Stocks**

Generally, commercial market wood stocks will not have a selector cutout. There has been at least one exception though. In 2005, Fulton Armory offered an unfinished new manufacture walnut USGI pattern M14 stock with or without the selector cutout

Before 1994, Springfield Armory, Inc. offered extra fancy AAA grade walnut stocks as an option for the M1A. Springfield Armory, Inc. M1A black color synthetic stocks are often fitted with a rubber butt pad. This softens the recoil and the overall length is increased by an inch. Some Springfield Armory, Inc. black color crinkle texture and woodland camouflage synthetic stocks did not have the selector cutout filled in. This was typical of M1A stocks in the late 1980s and early 1990s. Beginning in 2003, Springfield Armory, Inc. standard and Scout Squad M1A rifles were produced with mossy oak hunting camouflage pattern synthetic stocks. Until the summer of 2008, Springfield Armory, Inc. M1A rifles were outfitted in textured and painted USGI synthetic, commercial walnut or USGI birch stocks. Beginning mid-2008, Springfield Armory, Inc. assembled some M1A rifles with its new manufacture molded polymer stock. These stocks are black in color, have no selector cutout, and do not require use of the USGI butt plate screw square nut and nut retainer.

Boyds' Gunstock Industries, Reinhart Fajen, Inc., Shaw and Wenig Custom Gunstocks have manufactured wood stocks for the M14 type rifle at one time or another. Reinhart Fajen, Inc. supplied a lot of 100 match grade M1A stocks without the selector cutout to Springfield Armory, Inc. in Texas in late 1971. The Reinhart Fajen, Inc. Style II was a medium contour stock available in walnut or laminated wood. Fred Wenig was the plant manager at Reinhart Fajen, Inc. for many years. He now operates his own gun stock making business in Lincoln, MO. Wenig Custom Gunstocks produces a Monte Carlo style comb M1A rifle stock with a more vertical grip and double palm swells. It is available in walnut or laminated birch. The Wenig traditional style M1A stocks are made in maple or walnut. Wenig also produces the adjustable cheek rest walnut stock for the Springfield Armory, Inc. M21 rifle.

Boyds' Gunstock Industries offered two styles of M1A stock in walnut or laminated wood until October 2007. The Boyds' Style I was not inletted for bedding but Style II had a semi-inlet cut and must be bedded. The Style II stock was discontinued in October 2007. At the same time, the Style I M1A stock was dropped from its catalog. Boyds' M1A walnut stocks were slightly wider at the rear end than the USGI M14 butt plate.

Springfield Armory, Inc. offered Shaw stocks as optional items in 1982 and 1988 through 1990. In 1982, there were two M1A Combat models. One model had a laminated walnut standard stock and a metal flappered butt plate. The other M1A Combat model was fitted with a laminated walnut pistol grip stock and a rubber butt pad. Both stocks had the John Shaw design forearm. In 1988 and 1989, both Shaw walnut standard and walnut M14E2 style stocks were offered. The following year 1990, the Shaw walnut standard stock was an optional catalog item. The John Shaw design stocks were easily identified by the rectangular shaped extra forearm thickness in the area of the front sling swivel. The front sling swivel was secured to the stock by two hex head screws.

The Chinese stocks on M14 rifles imported into the United States by Keng's Firearms Specialty and Century Arms International were made of chu wood. Chu wood only grows in Manchuria, China near the Russian border. Chinese M14 type rifles imported by IDE USA/CJA into the United States have walnut stocks. The walnut for these stocks was harvested in Yunnan Province, People's Republic of China. Chu is softer and lighter than black walnut. Why was chu wood selected for the Chinese M14? Because chu has very good resistance to the effects of mildew, a desireable property in the humid climate of Viet Nam.

For long term storage, a rifle fitted with a wood stock should have the trigger guard unclamped from the stock. This will allow the wood stock to expand and contract as the weather changes, avoiding compression of the wood and loosening of the receiver-to-stock fit.

The USGI M14 fiberglass stock lends itself to camouflage pattern finishes by anyone with an imagination, a steady hand and paint. Whamo Camo (MO) painted about 500 M14 fiberglass stocks with camouflage patterns between 1998 and 2006. Of the two dozen or so patterns offered, the Vietnam Tiger Stripe was the most requested. Likewise, Karsten's Custom Camo (UT) camouflage patterns are likewise superb examples of what can be done to dress up the M14. Karsten's Custom Camo has been in business since 2001.

The flip up butt plate on the M14 and M14E2 stocks was adopted from the M15 rifle that was declared obsolete in 1959. An M14 stock can be fitted with an M1 Garand butt plate to shorten the overall length by about ¼ ". However, the part of the stock heel which houses the butt plate's hinge should be filled in with suitable material. An alternate solution provided by SparrowHawk M14 Stocks is to remove the hinge and roll pin from the M14 butt plate. The stock is preserved and the storage compartment is still readily accessible. A USGI M14 stock installed to a Chinese M14 rifle will require fitting, as there are small dimensional differences. A design for an adjustable butt stock extender was patented by Peter Lautrec (then of Baldwin, WI) in 1994. Mr. Lautrec's design took advantage of the butt stock storage compartment to house two dowels. A butt plate was attached at the rear of the dowels. Without the spacers, the length of pull was extended by 1 5/8 ". Various length spacers up to 1 " could be added for even greater length of pull.

Israeli Military Industries modified the USGI M14 stocks it supplied for the Israeli Defense Forces. An integral cheek rest and rubber butt pad for sniper duty was added to each stock. The Israelis used two different versions of its M14 stock. The early version had a shorter length cheek rest, while the later version used a longer cheek rest. A rubber pad was attached to the rear end of the longer cheek rest on stocks so equipped. The IDF M14 stocks also had left hand side sling swivels just aft of the stock ferrule and just forward of the rubber butt pad and a metal-reinforced bipod stud just aft of the bottom front sling swivel. Some of these stocks have been exported back to the United States for commercial sale. Springfield Armory, Inc. purchased some of these stocks and painted them black. These stocks were used in the assembly of the IDF M1A rifles. By 2000, scoped M14 rifles in the Estonian Army were fitted with medium green color thumbhole plywood stocks and classified at the M14 TP model.

Sage International, Ltd. - Sage International offered its M14 EBR stock with a fixed Remington 870 shot gun butt stock or in conjunction with Fulton Armory, a wood M14 butt stock. This stock is legal under local state law for sale to California residents.

J. Allen Enterprises, Inc. - J. Allen Enterprises produces and markets the JAE-100 stock for M14 type rifles. Development of the stock began in 2003. The JAE-100 is legal for civilian owners in California. J. Allen Enterprises corresponded with the California Department of Justice for several months to ensure the design of the JAE-100 stock did not meet the California definition of an assault weapon pistol grip stock. This correspondence resulted in a letter from the California Department of Justice dated October 22, 2003 which specifically confirmed the definition of an assault weapon pistol grip stock. The JAE-100 stock design did not meet the definition of an assault weapon pistol grip stock.

The first generation JAE-100 stock was made of a proprietary polymer material molded over a full length aluminum skeleton. It had a textured exterior surface. The JAE-100 stock was offered in seven colors: dark earth, coyote brown, olive drab, titanium grey, lowlite green, grit tan or SWAT black. A cheek rest with adjustment spacers, a palm rest, an off hand rest and butt spacers were supplied with the stock for individual fitting. The cheek rest, palm rest, off hand rest, butt spacers, and butt adapter were made of polymer and the butt pad and grip were made of rubber. The first generation stock was configured for semi-automatic only M14 type rifles but would accept receivers with a rear lug.

The JAE-100 design changed the way the M14 type receiver was held to the stock. Two adjustable titanium locking plates and two screws locked the receiver to the full length aluminum skeleton. The locking plates rested outboard of the the trigger guard hooks inside the stock. The screws attached to the locking plates from the bottom of the stock. The firing mechanism was installed in the normal manner. The first generation JAE-100 stock weighed 3 pounds 4 ounces stripped (out of the mold before hardware added) and 5 pounds 4 ounces with all accessories installed. The first generation JAE-100 stock would accommodate standard, medium weight or heavyweight contour M14 barrels without any fitting. Sling swivel studs were located on the left hand side of the stock. The bipod stud was located aft of the M1913 Picatinny style rail section on the fore end bottom side. Options included textured matching color traditional style hand guard, a single point sling plate, and personalized markings. The first generation JAE-100 stock length of pull could be adjusted from 12. 4 " to 15.4 ". Its dimensions were as follows: overall length - 34.6 ", overall width - 2.1 " and overall height - 6.5 ".

In November 2007, J. Allen Enterprises brought the second generation JAE-100 stock to market. The same seven color choices were available to the buyer. Without optional accessories, the weight of the second generation JAE-100 stock was about 4 pounds. For the second generation stock, the optional accessories included: hand guard (standard, heavy barrel, or cutout for barrel scope mount), adjustable cheek rest with spacers, thumbwheel adjustable cheek rest, 6 " or 9 " long six o'clock Picatinny rail section, aluminum off hand rest with integral Picatinny rail section, 4 " or 9 " Picatinny side rail assembly, side mounted flush cups, bipod adaptor with a sling swivel stud, butt pad and spacers, butt stock single point sling plate, adjustable palm rest with spacers, barrel tensioner, titanium lug slides, and personalized markings.

The second generation JAE-100 stock differed from its predecessor with these features:

1) trimmer, narrowed butt stock

2) lower cheek comb for facilitating use of iron sights

3) shorter length-of-pull for the basic stock

4) butt adaptor was changed to anodized aluminum construction

5) augmentable or removable rubber grip

6) selector cutout model available for select fire rifles

6) 7075 alloy aluminum lug slides standard

7) flush plugs in eight positions standard with flush cups optional for either side of the stock

8) new fore end structure built into the aluminum skeleton to accept new optional barrel tensioner for in-use adjustment of force bearing on the barrel and front band

9) more visible aluminum on the bottom side of the stock

10) optional thumbwheel operated cheek rest enabling the operator to lower the cheek rest without tools

11) the inside of the fore end is all aluminum with welds machined down and no need for a thermal deflector

12) optional quick detach mechanism for the cheek rest.

LAW483 Enterprises – LAW483 Enterprises creates fixed butt M14 stocks by modifying USGI synthetic stocks or by forming them from laminated wood or by use of woodworking methods for extra fancy woods such as maple or walnut.  The M14 butt plate can be replaced with a M1 Garand butt plate or a rubber recoil pad.  The USGI M14 stocks are typically stiffened in the fore end and any factory depressions filled in.  The USGI synthetic stocks can also be modified to create a right, left, or ambidextrous vertical grip.  Options include filling of the selector cutout, various grades of surface texturing, single point sling attachment, side sling swivels, LAW483 proprietary enhanced magazine well, camouflage pattern painting, acrylic coating, and reducing or increasing the length of pull per customer order.

LAW483 M14 fixed butt stock offerings can be divided into four categories: 1) pistol grip 2) vertical grip 3) thumbhole and 4) standard grip.  The pistol grip models are the M-14 E2, and the M-21 E2.  Vertical grip M14 stock choices include the LAW-TAC Vertical Grip Ruck Rest, the LAW-TAC Off-Hand, and the Vertical Grip Match.  Two thumbhole style M14 stocks are available, the LAW483 Thumbhole Sporter and the LAW483 Thumbhole Tactical.  The more traditional standard grip choices include Standard Grip Recoil Pad, USGI M-14 Buttplate, M-1 Garand Buttplate, Body Armor Designated Marksman, and the LAW-TAC Patrol Stock.

Short Rifle Stock Systems, Inc. - Richard Cabral served in the U. S. Marine Corps from 1966 to 1974 and in the Army National Guard in the 1990s.  He is owner and Chief Executive Officer of Short Rifle Stock Systems, Inc.  In September 2007, Short Rifle Systems, Inc. introduced its bull pup stock conversion for the M14 type rifle known as the Short Rifle Stock System or SRSS.  The SRSS was available in two versions, SRSS-14T-A designed for Close Quarters Battle and the SRSS-21SA intended for use as a precision rifle.  Depending on the length of barrel on the rifle and the version installed, the overall length could be reduced from 17 " to 20 ".  Accordingly, the owner would be obligated to comply with the NFA rules regarding short barrel rifles.  The only tools needed to install the SRSS were a hex head wrench and a screw driver.  The stock body itself which supported the barreled action and firing mechanism could be fabricated from a number of materials to include machined alloy aluminum billet, fiberglass, polyethylene terephthalate resin, wood or carbon fiber. The cheek rest for the SRSS-14T-A model was made from alloy aluminum. Separate right hand side panels were made for M14 type rifles with and without select fire parts. The issue hand guard was replaced with an Amega Ranges, Inc. accessory rail for mounting optics. The stock panels and accessory rail were made of alloy aluminum. Installation of either SRSS model required removal of the rear sight assembly. By September 2008, the conversion kits were available in synthetic material, SRSS-1421SM, or machined billet alloy aluminum, SRSS-1421BA. The alloy aluminum conversion kit weighed 1.5 pounds more than the synthetic material kit. The stock conversions were available from beginning to the present in a choice of three finishes, black, tan or olive drab.

McCann Industries - Introduced at the 2008 SHOT Show, the McCann Industries carbon fiber M14 stock was compatible with any M16 type butt stock and pistol grip. It came with a matching carbon fiber hand guard that was secured to the stock with eleven hex head screws. Other than that, it assembled to the rifle like a USGI M14 stock. The McCann carbon fiber hand guard did not clip to the barrel. The front end of the hand guard and stock were formed to mate with the front band. A two piece alloy aluminum fitting was bolted and epoxied to the interior rear end of the stock. This fitting served as the means of attaching the butt stock assembly and pistol grip provided by the end user. The McCann carbon fiber M14 stock would accommodate standard, medium or heavyweight contour barrels. The stock was fitted with 7 " long M1913 Picatinny anodized alloy aluminum rail sections at three, six, nine and twelve o'clock. The McCann stock was available in black only but could be easily painted like the USGI synthetic stock.

In early 2008, Viron Tactical (Omaha, NE) made available its Generation 4 Viron stock for the M14 type rifle. The Generation 4 Viron stock is a wood core completely wrapped in carbon fiber. It has a clamp on each end of the receiver area to allow for secure fitting of different manufacture commercial receivers. The Generation 4 Viron stock accepts M16 compatible butt stocks and pistol grips. This stock has a six o’clock M1913 Picatinny rail, either 6 " or 11.5 " long according to the buyer’s preference. The President of Viron Tactical is Kenneth Hall.

**Hand Guards**

USGI Hand Guards - The very first hand guards for the USGI M14 were made of black walnut. These were changed to a slotted fiberglass model in 1961. Later, the under side of the slotted fiberglass hand guards were painted silver to help dissipate barrel heat. Apparently, some of the slotted hand guards stayed with the rifles for some time. From a photograph of PFC John F. Dugan, USMC taken in September or October 1966 near An Hoa, Quang Nam, Republic of Viet Nam, one can see a slotted hand guard on his M14 rifle.

The slotted fiberglass hand guards were found to be relatively fragile (especially by U. S. Marines practicing close order drill), and caused mirage over the barrel on rapid fire. So, some changes were made to the hand guard die to create a solid fiberglass hand guard. The average thickness of the M14 hand guard was increased from 0.070 " to 0.090 ". Both slotted and solid USGI hand guards were ribbed to increase rigidity. The solid fiberglass hand guard design was finalized in October 1961. The solid hand guard became the standard in 1962. USGI solid hand fiberglass guards were made in at least four color variations, coffee, brown, dark brown and black although the drawing only specifies one shade of lusterless brown, FED-STD-595 number 30045. Late production solid fiberglass hand guards have two ribs on the under side of the hand guard band (clip) groove. Wood and slotted fiberglass hand guards on USGI M14 and M14 NM rifles are replaced with solid fiberglass hand guards during overhaul.

Fiberglass was developed in the late 1940s. It is a composite material made up of glass fibers dispersed throughout a polymer resin matrix. Fiberglass has about the same longitudinal tensile strength as wood but it is not as stiff. The benefits of fiberglass hand guards over wood hand guards are less maintenance and better resistance to the effects of weather. Wood and fiberglass both have poor thermal conductivity which means they are excellent insulators. This is a useful engineering property for the M14 hand guard and stock for obvious reasons.

USGI M14 solid fiberglass hand guards have been observed with the following markings on the bottom side: 1) the letters DT followed by a number ranging from 2 to 67 or 2) the letters WC followed by a number or 3) just a number such as 2, 3, 4, 5, 6 or 8 as found on those made by Structurlite Plastics Corporation. The slotted hand guards have been observed with markings such as DT 9, DT 10, DT 12, DT 15, DT 23, DT 25, DT 31, and DT 32 on the under side. Earlier solid fiberglass hand guards were not painted silver on the under side, e.g., hand guard marked DT 19. Solid hand guards observed with the markings DT 23 and higher are painted silver on the bottom for heat dissipation. Solid fiberglass USGI hand guards weigh about 3 ounces.

Commercial Production Hand Guards - Between 1978 and 1994, Springfield Armory, Inc. sold heavy walnut match, fancy burley walnut, extra fancy AAA grade walnut and laminated walnut/maple hand guards for the M1A. It has installed commercial reproduction plastic hand guards on M1A rifles from the mid-1990s onward due to the scarcity of new USGI hand guards. Some Chinese M14 rifles were imported into the USA with a marbled brown synthetic hand guard. Reinhart Fajen, Inc. offered matching wooden hand guards when it was producing M14 stocks. Boyd's' did sell matching hand guards for their wood stocks until production ended in October 2007. Wenig Custom Gunstocks, Inc. offers walnut and laminated birch hand guards for its M1A Scope Stock. Commercial wood hand guards are noticeably thicker than the USGI wood hand guards. Fulton Armory offers a more rugged solid glass-reinforced polymer brown color hand guard, as compared to even the USGI solid fiberglass hand guard. The Fulton Armory hand guard may be ordered with an optional black color textured epoxy coating. Fulton

Armory glass-reinforced polymer and Springfield Armory, Inc. plastic hand guards are not silver color on the bottom side.

Carbon Fiber Hand Guards - In 2004 and 2005, there was a limited amount of research and development performed by private individuals to manufacture carbon fiber M14 hand guards. Carbon fiber-polymer, or carbon fiber for short, is one of many types of fiber-reinforced composite materials. A reinforced-fiber composite material is made up of strong but brittle fibers residing inside a tougher and more ductile solid matrix material, e.g., bricks made of mud and straw.

The carbon fibers can be loose and randomly arranged inside the matrix or they can be woven into two or three dimensions. Fibers can be formed from metal, glass, plastics, carbon, or other materials. The matrix material can be made from a metal (aluminum, magnesium, tin, etc.) or a polymer (polyester, epoxy, vinyl ester, etc.) or a ceramic (aluminum oxide, zirconium oxide, glass, etc.). Polymer base matrices are suitable for operating temperatures below 600 degrees Fahrenheit, e.g., M14 hand guard.

The size, shape and number of parts to be made will influence the choice of manufacturing method. Loose carbon fibers can be mixed with a liquid resin (matrix material). The mixture could then be loaded into an injection molding machine. The mixture is pushed through a die to the form the part. Or the composite material mixture could be sprayed against a form and allowed to harden.

Loose, random carbon fibers may be held inside a sheet of matrix material. Such a structure is referred to as a mat. The part can be formed by laying and pressing reinforced-fiber resin mat against a die, or pattern of the part. This method is suitable for manufacturing M14 hand guards. Pressing the mat against the die to form the part can be accomplished in a number of ways: 1) pushing a hand roller against the mat while the mat is lying in the die 2) using gas pressure or vacuum to press the mat against the die or 3) using a matching die to push the mat against the die underneath it. The form is taken from the die, cured, and the flashing, or trim removed to create the final product. Fiber-reinforced composite material can be finish machined by conventional means (saw, router, mill, drill, shear, sander, etc.) but precautions must be taken to avoid skin contact or inhalation with splinters and dust.

Carbon fiber mat is more expensive than fiberglass mat. Carbon fiber-epoxy composite material is several times stronger and stiffer than fiberglass, pound for pound. Not surprisingly, the greater strength of carbon fiber is more expensive. In 2005, carbon fiber mat was about four times the cost of fiberglass mat. Carbon fiber will deteriorate over time from ultraviolet ray exposure (sun light). Thus, a clear polyester coating containing an ultraviolet ray inhibitor should be sprayed on the surface of the die before the carbon fiber mat is laid down.

Epoxy resin is stronger than polyester resin or vinyl ester resin but also more expensive. M14 hand guards made from three layers of carbon fiber-epoxy resin composite material are strong enough to support the weight of a man standing in the middle with the ends supported without breaking or cracking. However, carbon fiber-epoxy resin is a brittle material. When the sides of a carbon fiber-epoxy resin hand guard were flattened together in a vise the material broke where held by the jaws of the vise.

In 2005, a private individual in the United States made carbon fiber-epoxy resin M14 hand guards for himself and a friend. When finished, the hand guards were about 0.030” thick using the vacuum bag method described above. One of the hand guards had an aesthetically pleasing turquoise color. He was able to produce this color by adding a small amount of blue pigment to the clear polyester ultraviolet ray inhibitor coating.

**USGI Sights**

The M14 type rifle has the best iron sights of any battle rifle. The sights are easy to operate. Once a 250 meter zero is set, the sights do not need adjust under most battlefield conditions. The M14 sights are almost identical to those found on the M1 Garand rifle but it has the longest sight radius of any magazine fed semi-automatic battle rifle in the world. The M14 rifle has a sight radius of 26.75 " with the rear sight aperture set at 100 meters. The very long sight radius helps maximize the battlefield accuracy of the M14 rifle. The long sight radius also makes it easier for farsighted shooters to use iron sights. There are three sizes of front sight blades and three sizes of rear sights.

Rear Sight Assembly - The standard issue rear sight aperture has a diameter of 0.069 " + 0.005 ". The USGI M14 also had two National Match rear sight aperture sizes, 0.0520 " and 0.0595 ". Either National Match rear sight aperture can be fitted with an adjustable hood (National Match rear sight apertures without the hood were made only for the M1 Garand rifle). Use of the hood on the rear sight allows for one-half minute of angle adjustments in elevation. The elevation knob always moves point of impact one minute of angle per click, while rotating the sight hood will add or subtract a half-minute of angle of elevation. A notch in the rear of the hood designates the direction of the extra adjustment—rotating the notch from the six o’clock position to the twelve o’clock position will add elevation, while rotating the notch from the top position to be on the bottom will subtract elevation. The hooded eyepiece was developed by no later than May 1961 at Springfield Armory by Nicholas J. Angelica.

Rear Sight Base - The M14 standard (rack grade) rear sight base was borrowed from the same 1937 vintage part for the M1 Garand rifle. Additionally, three other rear sight bases could fit the M14 rifle. These rear sight bases were marked NM, NM/2 and NM/2A. The NM rear sight base was designed about 1958. It accepted a non-hooded rear sight aperture but would not allow a hooded aperture to fully lower into the base. The 1961 design NM/2 rear sight base was a NM rear sight base machined after manufacture to allow a hooded aperture to fully seat in the base. Subsequent to the NM/2 modification, the 1963 design NM/2A rear sight base was a newly manufactured part that allowed the rear sight base to be fully lowered into the base.

Elevation and Windage Knobs - The M14 type elevation knob will have the letter M inscribed on it between the numbers 10 and 11. This denotes calibration in meters. If the elevation knob does not have a letter M, the knob is calibrated in yards and was made for the M1 Garand rifle. As a rule, M1 Garand rifle elevation knobs were not allowed on M14 rifles in the U. S. military. However, for a period of four months or less in 1969, M1 Garand rifle elevation knobs were authorized for replacement of M14 elevation knobs on M14 rifles at Fort Bragg. During this time, there was a shortage of M14 elevation knobs in the Army supply system. The elevation knobs on the M14 rifles at the Basic Training shooting ranges had worn out from use by recruits. In order to keep the M14 rifles in service for training and qualification, Rock Island Arsenal authorized the short term substitution of M1 Garand elevation knobs for the M14 rifles.

The windage knob on an M14 type rifle will either be the standard one minute per click adjustment, or the National Match model of one-half minute of angle per click adjustment. The National Match windage knob must be matched to a National Match rear sight base because they both have finer threads than the standard USGI parts. The finer threads of the National Match rear sight parts allow the smaller angle adjustments.

Front Sight - The front sights are classified by the width of the rear side of the sight blade. The standard or USGI front sight is 0.084 " - 0.010 " wide. The military National Match front sight is 0.065 " - 0.005 " wide. The top surface of both sight blades slope downward at an angle of 5 + 1 degrees, rear to front. The M14 front sight can be used as a range finding device by the shooter. Assuming a 22 " barrel length, a 20 " wide target (frontal view of a deer) will appear to be the same width of the front sight post at the following distances: 0.062 " USGI NM sight - 230 meters (251 yards), 0.072 " commercial NM sight - 198 meters (216 yards), and 0.084 " USGI sight - 169 meters (185 yards). NM sights will be marked NM 062 or NM 072 as appropriate.

Combination Gas Cylinder Lock Front Sight - The traditional M14 front sight and flash suppressor assembly is not the most suitable attachment point for a sound suppressor. The combination gas cylinder lock front sight was developed by Smith Enterprise, Inc. to meet the U. S. Navy requirement to allow for the possibility of installing a sound suppressor on Navy Mk 14 Mod 0 rifles. There are two basic designs of the Smith Enterprise combination gas cylinder lock front sight, a hooded non-adjustable post type sight and a traditional dovetail type sight.

If a M14 type rifle is assembled with a Sage International M14EBR or Chop Mod stock, the fastening of the Sage operating rod guide to the stock causes the bullet point of impact to be lower than it would be if a non-Sage stock was used. Also, a shorter barrel requires the height of the front sight to be taller to achieve the same point of impact as the standard configuration of 22 " barrel and traditional USGI flash suppressor and front sight.

Thus, when SEI installs a combination gas cylinder lock hooded non-adjustable front sight, the barrel length (18 " or 22 ") and the stock (Sage or non-Sage) are factors in setting the height of the post sight.

The hooded non-adjustable post type sight, model GLFS-H, was developed by no later than 2003. It was the first combination gas cylinder lock front sight produced by Smith Enterprise. The advantages of the hooded non-adjustable post type combination gas cylinder lock front sight over the traditional M14 front sight are faster target acquisition, better front sight protection, and no possible shifting of the front sight. Subsequently, the GLFS-D-18 and GLFS-D-22 combination gas cylinder lock dovetail type front sights were developed for users who wanted to be able to fine tune the iron sights while maintaining the option to mount a sound suppressor in conjunction with the SEI M14DC flash hider. The GLFS-D-18 model has a taller sight base to account for the shorter 18 " barrel it is mounted on. Similarly, the GLFS-D-22 part is intended for use with 22 " length barrels.

A very few of the Smith Enterprise M14 EBR combination gas cylinder lock dovetail type front sights have metal removed from under the front half of the dovetail sight base. The machining cut is a pronounced ninety degrees under the sight base. This particular modification was done an earlier means of allowing installation of a Smith Enterprise direct connect flash hider on a 17 5/8 " barrel. All Smith Enterprise combination gas cylinder lock front sights are made from nitrocarburized AISI 4140 alloy steel. The hardness specification for the combination gas cylinder lock front sights is 55 to 60 HRC. From 2004 onward, Smith Enterprise stamps its parts with serif font lettering.

Combination Gas Cylinder Lock Front Sight Markings - Earlier Smith Enterprise, Inc. combination gas cylinder lock front sights are marked PAT. PEND. on the top line and U.S.N. on the bottom line. Beginning in July 2005, the Navy issue combination gas cylinder lock dovetail type front sight was marked U.S.N. on the top line and SMITH ENT on the bottom line. Later that year, Smith Enterprise began marking combination gas cylinder lock front sights with U.S.A.F. and SMITH ENT in a similar fashion. By April 2006, the Navy Mk 14 issue combination gas cylinder lock sight marking was changed to U.S.N. on the top line and MK-14 on the bottom on the front side and S.E.I. on the rear side. The part markings change again by December 2006 to read on the front side: top line - U.S. and bottom line - M-14. The rear side was marked the same, S.E.I.

Installation of a Sage International, Ltd. M14 stock locks the stock and barrel together at a third point through the proprietary operating rod guide (the other two contact points are the stock ferrule to barrel front band and the receiver-to-firing mechanism interface). This fastening of the barrel improves accuracy but causes the non-Sage stock combination gas cylinder lock front sight, model GLFS-D-22, to have a point of impact markedly lower than what it would otherwise. The GLFS-D-18 model is employed on U. S. Navy and U. S. Air Force Mk 14 variant rifles which use the Sage International stocks. In 2006, Smith Enterprise, Inc. installed GLFS-D-22 gas cylinder lock front sights installed on M14 rifles rebuilt for the U. S. Army 101st Airborne (Assault) Division.

Both models GLFS-D-18 and GLFS-D-22 have a modest bevel on the front end under the barrel. This bevel facilitates use of the Smith Enterprise direct connect flash hider on 17 5/8 " barrels equipped with these front sights. The longer distance from front to rear of the dovetail style combination gas cylinder lock front sights does not permit use of the M2 type bipod.

**Commercial Sights**

Chinese rear sight aperture diameter tends to be larger than on the USGI standard model. Tooltech Machine, Inc. (Oxford, MI) can install a 1/8 " tritium insert into the M14 type front sight for use in low light conditions. Brownells, Inc. sells an Alley Supply globe style front sight and set of inserts for the M14 type rifle. This type of front sight is useful in reducing eyestrain in target match shooting. The Rock SOPMOD M14 and Troy Industries M14 MCS can use flip-up type M16 type sights.

Springfield Armory, Inc. - Springfield Armory, Inc. made a 0.072 " NM front sight for its match rifles in the 1980s. It is marked NM 072 on the side. Springfield Armory M1A Scout and Bush rifles are fitted with slightly different front sights to compensate for the shorter barrel. The Scout / Bush front sight blade height itself appears no different, but its base is 4 millimeters taller. It measures 0.697 " to 0.705 " from the bottom of the front sight base to the top of the rear side of the blade. This in comparison to the USGI design front sight which has a nominal height of 0.567 " from the base to the top of the rear side of the blade. This is significant as each 0.008 " is equivalent to one click of elevation on the rear sight knob for a 22 " barrel. The wrong front sight for either barrel will make a huge difference on the setting of the rear sight aperture for the sight zero.

Smith Enterprise, Inc. – Smith Enterprise M14 National Match front and rear sight parts are machined from AISI 4140 alloy steel bar stock using the wire EDM method. The rear sight aperture is the hooded type. Smith Enterprise plans to produce the standard rear sight aperture in the future. Amherst Arms will be the distributor for Smith Enterprise, Inc. front and rear sight parts.

Close Quarters Battle Application Sights - In 2004, XS Sight Systems introduced a M14 type rifle front sight for Close Quarters Battle situations. It is the factory issue front sight for the M1A SOCOM models. The front sight is a post sight. The rear side of the post, facing the operator, is a white color vertical strip with a tritium dot centered within the strip. This sight set is designed for faster acquisition of targets over the traditional sights. Sight sets for 16 ", 18 " and 22 " barrels are available. The XS Sight Systems front sight installed on M1A SOCOM models has a height of 0.725 " from the bottom of the base to the top of the rear side of the post. The rear sight aperture on the commercial M1A SOCOM and government Mk 14 Mod 0 models has been enlarged from the standard military diameter for faster target acquisition.

In August 2005 Smith Enterprise, Inc. debuted its M14 dovetail style tritium 0.076 " diameter dot front sight for low light conditions in short range combat. This sight was made from wire EDM manufactured AISI 4140 alloy steel and finished with a phosphate coating. The sealed tritium vial was supplied by Trijicon, Inc. In March 2006, Smith Enterprise, Inc. made available a second tritium front sight, a luminescent vertical bar post model. Like the tritium dot sight, this sight was also made from wire EDM machined AISI 4140 alloy steel and given a phosphate finish. It was marked SMITH ENT. on the right hand side. The luminescent post was supplied by Unertl Optical Company, Inc. In December 2008, the company finished its first batch of USGI design front sights.

Marstar Canada - In May 2007, Marstar introduced M14 metric thread gas cylinder lock front sights made in-house. The Marstar gas cylinder lock hooded front sight was manufactured from a choice of two materials, AISI 4140 alloy steel with a phosphate coating (catalog number M14-106) or titanium with a dull satin finish (catalog number M14-106T). These parts are compatible with Chinese manufacture M14 barrels only.

**Muzzle Attachments**

Several different muzzle attachments are available for the M14 type rifle. They can be classified into four categories, flash suppressors and hiders, muzzle brakes and stabilizers, grenade launchers and sound suppressors. Sound suppressors are discussed in separate sections. The reader should consult federal, state and local laws before removing or installing any muzzle attachments to an M14 type rifle. Some muzzle attachments may be illegal to attach to the rifle.

Closed Prong Flash Suppressors / Flash Hiders - A flash suppressor or hider is desirable for military purposes. It serves to eliminate the flash signature of a rifle or machine gun thereby conserving the shooter’s night vision and concealing his position from the naked eye. The flash suppressor works by cooling the gunpowder gas temperature to a point below the flash point. The wider bottom prong of the USGI and NM M14 flash suppressors aids in reducing recoil and muzzle rise. Finally, the flash suppressor serves as an attachment platform for the front sight, M6 bayonet, and M76 grenade launcher.

Flash suppressor testing of a T20E2 rifle in late 1951 demonstrated that a longer five prong suppressor was more effective at reducing muzzle flash than a shorter three prong suppressor. Consequently, the M14 flash suppressor design consists of five long closed prongs with one wider prong centered at the six o’clock position. This also reduces muzzle climb and dust signature. The USGI flash suppressor was fitted on all USGI M14 rifles except for match M14 rifles.

Match grade M14 rifles were fitted with flash suppressors that have been reamed out to National Match specification (a standard taper reamer is used to enlarge the end of the flash suppressor to 0.406 " wide). The USGI M14 flash suppressor drawing F7791053 required the wrought or cast specified steel to be heat treated before machining. This heat treatment procedure consisted of first heating the specified steel to between 1350 and 1575 degrees Fahrenheit. The steel was then oil quenched and tempered for a minimum of thirty minutes to achieve the specified hardness.

Brookfield Precision Tool also made a special flash suppressor for the U. S. Navy. It had a front sight machined into it as it was built to support a silencer. The silencer hid or interfered with the standard front sight so the standard flash suppressor was not used. Some Chinese made M14 type rifles imported into the United States after March 1989 have faux flash suppressors or the suppressors completely cut off at the muzzle. Some of the imported Chinese M14 rifles had the flash suppressor tack welded to the flash suppressor while others were not permanently secured at all. The Chinese faux flash suppressors were made without milling out the slots between the prongs. In 2001, Entreprise Arms, Inc. sold a M16A2 bird cage style flash suppressor for M14 type rifles. This has the advantage of shortening the rifle overall length by about one and one-half inches.

Yankee Hill Machine Co., Inc. introduced its Phantom M14 Flash Hider in 2008. It was offered with a detachable dovetail front sight base (Item # YHM-3080-M14-A) or without (Item # YHM-3080-M14). The dovetail front sight base was designed for use with a standard USGI or National Match front sight. It was secured to the rear end of the Phantom Flash Hider by a hex head screw. The detachable dovetail front sight base was sold separately as well (Item # YHM-3330). The detachable dovetail front sight base was not compatible with M14 barrels 18.5 " or shorter.

Open Prong Flash Suppressors / Flash Hiders – Smith Enterprise, Inc. makes an open prong flash hider which is not subject to problems normally associated with such designs. The straight prong flash hider design is susceptible to loosening under fire unless it is very tightly torqued on to the barrel. The Smith Enterprise flash hider solves this problem. It was invented, designed and refined by Sonja Sommers of Smith Enterprise, Inc. in 1994 and early 1995. It is a patented accessory. This flash hider is machined from AISI 8620 bar stock alloy steel then case hardened to provide a tough core and hard surface for maximum strength. It is given a phosphate coating and comes with a conditional lifetime guarantee. The dimensions are 2 ¼ " long and 0.861 " diameter. It is sound suppressor capable. The flash hider is secured to the barrel by threads but it is not a timed item (no specific parts need to be lined up when installed). When the Smith Enterprise flash hider is fastened, it is simply snugged tight and it does not need a lock washer to stop its rotation at any specific alignment. It conceals better than 99 % muzzle flash and greatly reduces muzzle climb even on full automatic. Four specially angled flutes dissipate the gas but contain the unburned powder allowing increased residual burn for less visible flash.

Smith Enterprise manufactured Sommers design M14 flash hiders for a short time in 1994. These flash hiders had six degree angled flutes, M16 style blank firing attachment grooves and a muzzle end snap ring brush protector groove. These features were incorporated into the 1995 patent. Subsequently, the Smith Enterprise M14 flash hider design was changed to a helix design without the blank firing attachment and brush protector grooves. It was discovered through testing that the brush protector groove enhanced flash so it was removed from the design. The helical flash hider tightens itself on the barrel's muzzle threads when the weapon is fired. The design also helps to evenly align exiting barrel gas to improve accuracy with all bullet types. The flash hider will have "left hand" angled slots for barrels with left hand threads and "right hand" angled slots for barrels with right hand threads. The Smith Enterprise flash hider has successfully passed the U. S. Navy 5000 round endurance test. It is in service with many U. S. law enforcement agencies and has been used in combat by the U.S. military.

Smith Enterprise offers four models of M14 flash hiders: 1) direct connect 2) traditional style front sight base with an integral flash hider 3) standard barrel muzzle attachment kit and 4) M1A SOCOM barrel muzzle attachment kit. The direct connect model threads directly to the barrel muzzle threads. The traditional style front sight base and standard barrel muzzle attachment kit versions attach to the barrel using the flash suppressor nut. The difference between these two is that the standard barrel muzzle attachment kit is a two part affair, a traditional style front sight base with male threads and a removable flash hider with female threads. The M1A SOCOM barrel muzzle attachment kit is also assembled into two parts, a combination gas cylinder lock front sight with a dovetail base with male threads and a removable flash hider with female threads. The M1A SOCOM barrel kit flash hider is patterned on the SA80 rifle flash hider supplied to the British military by Smith Enterprise, Inc. Except for the direct connect flash hider, these muzzle attachments use either a standard USGI or National Match front sight. The Smith Enterprise direct connect and M1A SOCOM kit flash hiders are sound suppressor capable (all NFA Rules apply). Use of the M1A SOCOM kit flash hider in conjunction witha sound suppressor requires installation of a modified gas cylinder plug available from Smith Enterprise, Inc. The modified gas cylinder plug allows the sound suppressor to fully engage the flash hider.

Springfield Armory, Inc. sold its M1A-A1 model with a short open prong flash hider from 1981 to about 1984. This flash hider was about 1 " long and had a slight taper narrowing to the front end. Starting in 2006, Arizona Response Systems (ARS) offered a muzzle attachment for the M1A SOCOM models. ARS modified the Springfield Armory, Inc. M1A SOCOM muzzle attachment by removing the muzzle brake and attaching an open four prong flash hider to the factory combination gas cylinder lock front sight. Entreprise Arms, Inc. listed a M14 open prong flash hider for sale for a time on its web site.

Adjustable Vibration Flash Hider - In years past, AWC Systems Technology has modified the M14 type rifle to increase accuracy by reducing barrel vibration. This modification included removing the front sight and flash suppressor, cutting the gas cylinder just forward of the spindle valve, welding a HK91 front sight just forward of the front band and threading an adjustable bird cage style flash hider on the barrel. This adjustable flash hider works in much the same way as the vibration reducing muzzle attachment on

Browning bolt action rifles. The flash hider is turned on the threads to find the optimum spot where accuracy is maximized for a given cartridge load.

Muzzle Brakes - Muzzle brakes are installed on M14 type rifles to reduce muzzle climb, felt recoil or to comply with state law, e.g., California's prohibition of civilian-owned flash suppressors. JP Enterprises, Inc. (Hugo, MN), famous for its M16 style muzzle brakes, has in the past manufactured a muzzle brake for the M14 type rifle. This muzzle brake included the sight base for the traditional dovetail front sight. Fabian Brothers Sporting Goods, Inc. (1986 address 3333 Midway Drive Suite 104 San Diego, CA 92110) made and marketed its M14 DTA MIL BRAKE muzzle brake in the mid-1980s. It was a two piece muzzle attachment consisting of a muzzle brake and flash hider. It was threaded on to the rear portion and secured with a lock nut. The flash hider was narrower than the muzzle brake section. The rear portion was secured to the barrel with the traditional flash suppressor "castle" nut. The rear portion had a bayonet lug and dovetail mount for the front sight. It was marked front to rear: front line - Fabian Bros middle line - MUZZLE STABILIZER rear line - CAL. 7.62. Even on automatic fire, it worked very well to keep the muzzle from rising. Jim Clark of Clark Custom bought the design rights from Fabian Brothers. Clark Custom produced another design muzzle brake for a time. This second muzzle brake had four radial holes in an otherwise solid wall cylinder. This single piece muzzle brake was integral with the front sight dovetail and bayonet lug.

Springfield Armory, Inc. installs its standard muzzle brake on the M1A Scout Squad model and all M1A rifles shipped to California except the M1A SOCOM models. The M1A SOCOM models have a proprietary combination gas cylinder lock and muzzle brake. Springfield Armory, Inc. installs a combination muzzle brake and stabilizer on its M25 model. That muzzle attachment has no provision for mounting a front sight.

Similar to its flash hiders, Smith Enterprise offers four models of M14 muzzle brakes: 1) U. S. Coast Guard (USCG) 2) Direct Connect California Compensator 3) standard barrel muzzle attachment kit and 4) M1A SOCOM barrel muzzle attachment kit. The Smith Enterprise, Inc. U. S. Coast Guard muzzle brake is machined from AISI 8620 alloy steel. It has successfully passed the U. S. Navy 5000 round endurance test. The USCG and standard barrel kit muzzle brakes attach to the barrel in the traditional manner, a threaded flash supressor nut. In October 2007, Smith Enterprise, Inc. made available its Direct Connect California Compensator. This part was made to look like the Smith Enterprise direct connect flash hider including the helical flutes but was in fact a muzzle brake making it legal for use in California. However, a small number were sold initially with straight flutes. The standard barrel and M1A SOCOM barrel muzzle attachment kits were introduced in mid-2008. All Smith Enterprise muzzle brakes use a standard USGI or National Match front sight except for the Direct Connect California Compensator which has no provision for a front sight like its sibling, the direct connect flash hider.

The standard barrel and M1A SOCOM kits both utilize threaded muzzle brakes to attach to the dovetail front sight base and the combination gas cylinder lock front sight, respectively. The removable muzzle brakes are included in each kit. The Direct Connect California Compensator and M1A SOCOM kit muzzle brakes are sound suppressor capable (all NFA Rules apply). Use of the M1A SOCOM kit muzzle brake in conjunction with a sound suppressor requires installation of a modified gas cylinder plug available from Smith Enterprise, Inc. The modified gas cylinder plug allows the sound suppressor to fully engage the muzzle brake. While it was available, the steel construction Entreprise Arms, Inc. muzzle brake was given a black oxide finish.

Troy Industries offered a CQB combination flash suppressor/muzzle brake for the Rock SOPMOD M14. It was machined from AISI 4140 alloy steel and given a phosphate finish. The front surface of the Troy Industries muzzle compensator consisted of many pyramid shaped points. The purpose of this was to prevent slippage of the muzzle when pressed against an opponent in extreme close quarters combat.

In 2007, Joe Dlask at Dlask Arms Corporation (Delta, BC) produced a small lot of muzzle brakes suitable for Chinese M14 barrels. The production Dlask Arms muzzle brake had four ports. It was threaded on to the barrel and then secured to the barrel flash suppressor splines by three small hex head setscrews. A pre-production version of this muzzle brake had a fifth port drilled at the front end for test instrumentation.

USGI M14E2/M14A1 Muzzle Stabilizer - The M14E2/M14A1 was fitted with the M2 bipod clamped to the gas cylinder and a stabilizer assembly fitted over the flash suppressor. Most rifle shooters are right-handed. Consequently, the stabilizer assembly had holes drilled in it which direct the majority of the muzzle gas to exhaust to the left side and slightly upward of the flash suppressor. This helped reduce muzzle climb during automatic fire. The original 1962 design of the USGI muzzle stabilizer did not include a locking mechanism also known as the yoke assembly. In September 1963, a yoke assembly was added to the muzzle stabilizer design. The early style yoke stop did not lock well enough to keep the stabilizer on the rifle during extended firing. So, the yoke stop was redesigned in April 1966 to the final version that is available today as a commercial reproduction. The second and final versions of the USGI M14E2 stabilizer assembly will be marked on the operating rod side of the locking mechanism with the part number. The second version was marked 7791661. The final version was marked ASSY 11686521. Earlier second version muzzle stabilizers were marked M on the front side of the locking mechanism lug while later second version and third version units were marked MPI in the same spot. Presumably, M and MPI mean the part was examined by magnetic particle inspection.

In the late 1980s, NSWC Crane modified the USGI M14A1 muzzle stabilizer. The muzzle stabilizer itself was redesigned as a hollow cylinder with semi-circumferential radial slots along most of its length but at the front end five wider radial slots were milled across the top and sides leaving the bottom solid. The front half of the NSWC muzzle stabilizer had more solid surface on the bottom than the rear half. The NSWC muzzle stabilizer project was begun by the supervisor of David P. Armstrong. His design greatly reduced felt recoil. Mr. Armstrong refined its design to minimize muzzle rise in automatic fire. Testing of the NSWC muzzle stabilizer in 1989 showed marked improvement in recoil reduction and muzzle control over the USGI design. The NSWC muzzle stabilizers were fabricated using both USGI and commercial reproduction M14E2 yoke assemblies. Mr. Armstrong did all of the production work with the exception of welding the yoke lugs to the stabilizer bodies. About thirty-five units were made and distributed to U. S. Navy SEAL Teams, including SEAL Team 3, for field evaluation. Unfortunately, funding was never obtained for this item.

Commercial reproduction M14E2 muzzle stabilizers made by Ray Kryza of Ray's Surplus (Warren, MI) are of high quality. These M14E2 muzzle stabilizers have been made since at least 1987. They will have a part number on the right side of the locking clamp.

Commercial Stabilizer – Springfield Armory, Inc. very briefly made its own version of a muzzle stabilizer for its folding stock M1A-A1 Bush rifle. Two variations of the Springfield Armory, Inc. muzzle stabilizer were made, one with a bayonet lug and one without. This muzzle stabilizer was made before the 1994 Assault Weapons ban. The muzzle stabilizer without the bayonet lug was installed at the factory in 1984 on M1A-A1 serial number 0298XX. The front portion of the Springfield Armory, Inc. muzzle stabilizer had a combination muzzle brake and bird cage style flash hider. It threaded on to the rear portion but was held in place by a single SAE 10-32 thread setscrew on the bottom. Removing the flash hider reduced the length of the rifle by 2.75 ". The rear portion of the muzzle stabilizer consisted of the front sight base and bayonet lug. It was marked on the bottom, front to rear: first line - SPRINGFIELD ARMORY second line - MUZZLE STABILIZER third line - CAL. 7.62. The outside diameter measured 0.6 " for the entire length of the stabilizer. Numrich Gun Parts Corporation and Sarco, Inc. imported cast reproduction M14E2 muzzle stabilizers which may or may not have any markings such as numbers or lettering. If there are no numbers or letters on a M14E2 muzzle stabilizer at all, it is of commercial manufacture.

Grenade Launchers – John C. Garand designed and patented a flash suppressor mounted grenade launcher for the T20/T44 type rifle. A benefit of his design was the positioning of the grenade all the way to the rear against the launcher no matter what the range. The distance to be fired was selected by turning a conical gas bleed ring at the launcher rear end to the desired setting. The stock suffered less impact force from launching grenades because excess gas was bled off through the conical bas bleed ring.

Earle M. Harvey at Springfield Armory may have designed what may be the most ambitious muzzle attachment ever conceived with the M14 rifle in mind. Mr. Harvey designed a combination muzzle stabilizer, recoil brake, flash hider and grenade launcher attachment. The muzzle attachment replaced the M14 flash suppressor and flash suppressor nut. It threaded on to the barrel muzzle end threads. It was designed to be installed as part of the rifle. The muzzle attachment was made ready for launching grenades by a quick twist of the front portion of the device. The Harvey muzzle attachment did not have any provision for mounting the rifle front sight. Presumably, the front sight would have been mated to the gas cylinder for M14 rifles equipped with these devices. Mr. Harvey filed a patent application for his muzzle attachment design on October 23, 1957 and it was approved on April 28, 1959.

The X-1 was an experimental breech-loading 40 mm grenade launcher made for the M14 rifle in 1961. It attached to the gas cylinder and bayonet lug. The electro-penciled marking Grenade Launcher 40 mm X-1 appears on the bottom side at the rear end. The X-1 grenade launcher used an experimental sight mounted on the left side of the stock like the issue M15 sight but it was larger with the angles of fire indicated along a protractor. A pull wire mounted along the right hand side of the stock terminated in a loop at a point between the trigger guard and the magazine.

The X-1 grenade launcher was developed by a Springfield Armory research engineer. It was tested at Fort Benning with very good success. However, the engineer, known as "Nick", almost lost his job because of it. Nick was asked by an unnamed official to fit a 40 mm grenade launcher to a M14 rifle. The unnamed official had been told by Rock Island Arsenal personnel that a 40 mm grenade launcher could not be added to a M14. Rock Island Arsenal was the parent command for Springfield Armory in 1961. Unfortunately, some professional jealousy existed at Rock Island Arsenal over the engineering expertise at Springfield Armory. Consequently, Nick's useful invention was not well received by personnel at Rock Island Arsenal. Nick may have been the same Nicholas Angelica who filed patents for the chamber brush and the National Match hooded eyepiece but this has not been confirmed.

While employed at Springfield Armory, Mr. Stanley D. Silsby of Granby, MA invented at least four different grenade launchers for the M14 rifle. He applied for a patent in 1961 on each design. The patents were approved in 1968 and 1969. All four designs had the launcher attached to the rifle at the bottom of the gas cylinder and at the bayonet lug. Two of the launcher designs employed pre-loaded disposable launcher tubes. The other two designs utilized permanent launcher barrels. Two grenade launchers were fitted with a storage rack under the launcher itself to hold an additional two 40 mm grenades or pre-loaded tubes. A patent application was filed simultaneously by Albert J. Lizza for an ejection mechanism used as the ejection mechanism in the Silsby design approved as U. S. Patent 3,404,477.

Of the four Silsby concepts, one was breech-loading (U. S. Patent Number 3,408,761). To launch a grenade using the breech-loading grenade launcher after loading, the operator had to simultaneously push the safety and the trigger buttons together against a spring. The safety and trigger buttons were located at the front end of the launcher on the bottom side. The breech-loading grenade launcher was the most viable of the Silsby designs.

Mr. Silsby was later employed by Colt's Manufacturing Company (then Hartford, CT) in the late 1960s and early 1970s working on the Army's Special Purpose Individual Weapon (SPIW) and the Air Force's Individual Multi-Purpose Weapon (IMP) projects. He was awarded five patents for work related to these two projects plus four patents for the M16 type rifle during his career.

Two 40 mm grenade launcher systems for the M14 rifle were demonstrated at Fort Benning and tested at Springfield Armory during the period of July 01, 1963 to June 30, 1964. The particular designs demonstrated and tested have not yet been identified.

The T140 grenade launcher was developed for the M14 rifle in 1955. The T140 grenade launcher latching handle assembly was redrawn in 1960. The T140 grenade launcher was adopted as the M76 and produced in 1961. The M76 grenade launcher weighs about 7 ounces. It is marked LAUNCHER GRENADE M76 U S on the rear end ring and 7790900 on the right side of the locking clamp. It became obsolete with the introduction of the M79 grenade launcher in the mid-1960s.

Rock SOPMOD M14 stocks could accommodate the newer M203 40 mm grenade launcher originally designed for installation on M16 series rifles. Civilians may own 40 mm grenade launchers in the United States in accordance with the National Firearms Act of 1934. Consult federal, state and local laws prior to installing a grenade launcher on a M14 type rifle.

**Military Sound Suppressors**

Military sound suppressors are used to conceal the origin of sniper fire, and/or deceive enemy troops regarding the shooter's location, by minimizing the muzzle blast. During the Viet Nam War, the XM21 rifle was sometimes equipped with the Sionics M14 SS-1 suppressor. Forty Sionics SS-1 suppressors were sent from the U. S. Army AMTU in February 1969 to the U. S. Army 9$^{th}$ Infantry Division Sniper School for testing in combat. An unknown quantity of Sionics SS-1 suppressors were shipped as a single batch to the U. S. Army in Viet Nam after April 1969 in support of the XM21. This suppressor consisted of a series of counterclockwise and clockwise metal spiral shapes abutting each other around a smooth perforated barrel extension core with rings fore and aft. A gas relief port was located at the rear end of the SS-1 suppressor. The SS-1 suppressor was designed for semi-automatic fire only. The Sionics SS-1 parts were made from 6061-T6 alloy aluminum and AISI 4130 alloy steel. The SS-1 suppressors were given a black color anodized finish. Physical data for the M14 SS-1 sound suppressor was as follows: 12.75 " overall length, 9.0 " additional length to the rifle when installed, 1.665 " outside diameter, 0.375 " bore diameter and 1 pound 15 ounces in weight. Some M21 rifles have been outfitted with Brookfield Precision Tool sound suppressors.

O. P. Seberger, Jr. was an electrician by trade but in retirement he took up sound suppressor design as his new career. He established OPS, Inc. (Shingletown, CA) in

1988. OPS, Inc. sound suppressors have seen service in Panama, Desert Storm, Somalia, Haiti and Afghanistan with the U. S. military. OPS, Inc. did more to advance sound suppressor technology from 1988 onward past 2000 than any other concern. One of its sound suppressors is featured in the 1994 movie *Clear and Present Danger* with Harrison Ford, Willem Dafoe and Anne Archer. OPS, Inc. sound suppressors are self-cleaning, maintenance free and guaranteed for 30,000 rounds or two years, whichever comes first.

After the American involvement in the Republic of Viet Nam, M14 DMR and M25 rifles were at times suppressed using OPS, Inc. 12$^{th}$ Model muzzle brake mounted sound suppressors designed by Phil Seberger. Designed to drain itself of water in six seconds or less, the 12$^{th}$ Model muzzle brake sound suppressor was made of fusion welded AISI 300 series stainless steel. Its sound attenuation was listed as 40 decibels. The military version muzzle brake suppressor included a barrel sleeve and thread protector. To install the OPS, Inc. sound suppressor, the operator needs to remove the thread protector on the suppressor. To configure a M14 rifle to accept the OPS, Inc. sound suppressor, the gas piston hole was welded shut then drilled to a diameter of approximately 0.055 ". The small hole restricted the flow of gas to the desired rate. With the suppressor installed, the bullet cleared the rifle before the operating rod was able to move enough to affect accuracy. Use of the OPS, Inc. 12$^{th}$ Model muzzle brake sound suppressor resulted in an average accuracy increase of 0.25 MOA and an increase of 20 to 50 feet per second bullet velocity. The muzzle brake portion of the assembly (manufacturer part number 01-B) reduced recoil and muzzle climb. If the sound suppressor was not installed, the muzzle brake created a noticeable flash signature at night when the rifle was fired. The OPS, Inc. suppressors saw service on M14 DMR rifles in Afghanistan during the Global War on Terrorism.

M14DC Sound Suppressor - Ron and Richard Smith of Smith Enterprise, Inc. and Dave Fisher of Fisher Enterprises (Tempe, AZ) have developed and produce a M14 sound suppressor that quickly attaches and detaches from the Smith Enterprise, Inc. direct connect flash hider. Production of the M14DC sound suppressor began in 2004. It is a factory supplied part of the M14SE/M21A5 rifle system, a first for the M14 platform. This sound suppressor weighs 2.08 pounds and has an overall length of 11.2 ". The length of the rifle is extended by 8.9 " with the suppressor installed. The suppressors sold to eligible civilians and U. S. law enforcement agencies are marked on the suppressor body: first line - FISHER ENT. MESA, AZ 85201 and the second line - MDL M14-DC CAL 7.62 S.N. M14-DC-XXXX. M14SE suppressors sold to the U. S. government and to other countries through the Foreign Military Sales program are marked with Smith Enterprise, Inc. on the body. The coupling mechanism will be marked FISHER ENT or FISHER/ SMITH ENT.

The suppressor body, end cap and baffles are made of 300 series stainless steel. The stainless steel portions of the suppressor exterior are coated with a black oxide finish. The quick detaching locking collar is made of titanium. 17-4 precipitation hardening stainless steel is used to fabricate the locking plates. All of the baffles are coated with thin dense chromium resulting in a surface hardness of 80 HRC. The first baffle in the sound suppressor is coated with polytetrafluoroethylene over the chromium. Both firms make the component parts needed for the M14DC sound suppressor and its lightweight version discussed below.

The suppressor does not require any modification of the M14 type gas system. This sound suppressor can be completely rebuilt in the field, a first for military sound suppressors. The M14DC sound suppressor may also be employed on M16 style, Enfield SA80, Fabrique Nationale FAL and FNC, and Heckler & Koch G3 and G36 rifles with the appropriate Smith Enterprise flash hider.

By May 2006, the M14DC suppressor body was changed to incorporate a 1 " long fluted contour just forward of the locking collar. In the fall of 2006, Smith Enterprise, Inc. made the initial delivery of M14DC sound suppressors to the U. S. Navy. The U. S. Navy has safety certified the M14DC sound suppressor for automatic fire on its Mk 14 Mod 0 and Mod 1 rifles.

M14DC Lightweight Sound Suppressor - By March 2006, Smith Enterprise, Inc. had developed and manufactured a titanium body version of the original M14DC model sound suppressor. The lightweight M14DC sound suppressor weighs 1.42 pounds. It was designed for semi-automatic fire and could be rebuilt in the field. The method of attachment to the rifle remained the same as with the original M14DC sound suppressor.

**Commercial Sound Suppressors**

Installation of a sound suppressor on an M14 type rifle may require modification of the gas system to prevent parts damage. Using a sound suppressor on a M14 type rifle generates some gas blow back into the face of the shooter. However, installation of a side three point scope mount on the suppressed M14 type rifle greatly reduces perceived blow back. Be sure to wear proper eye protection when shooting a suppressed M14 type rifle. Commercial manufacture sound suppressors sized for and used on .308 Winchester caliber rifles *typically* reduce the sound signature by 20 to 30 decibels.

Sound suppressors are regulated in the United States of America by the National Firearms Act of 1934 (the “NFA”). Note that the BATFE considers a sound suppressor to be a flash hider as well. It may be legal to own an NFA registered sound suppressor but still be illegal to use it for any purpose, e.g., State of Washington law. Consult all laws and an attorney knowledgeable in firearms laws prior to purchasing a sound suppressor.

American Suppressors - AWC Systems Technology has been manufacturing sound suppressors since 1983. In the past, the firm manufactured the M30 sound suppressor. The M30 suppressor used two mounting points to attach to a M14 type rifle. Today, AWC Systems Technology offers a smaller sized but very efficient sound suppressor for the

M14 type rifle, the Spectrum 2000. It is based on its Thundertrap model. The Spectrum 2000 sound suppressor is made from AISI 304 stainless steel, is 1.5 " in diameter, and weighs 28 ounces. It is 10.4 " in length but when installed the overall rifle length is only increased by 6.5 ". The flash suppressor and nut are removed from the rifle barrel. The Spectrum 2000 suppressor is then slid down the barrel and threaded on to the barrel threads for the flash suppressor nut. The rear end of the Spectrum 2000 suppressor stops about an inch from the front end of the gas cylinder plug. The suppressor comes in a choice of two finishes, matte black or matte stainless. The USGI front sight may be replaced with a combination gas cylinder lock front sight to retain the use of iron sights.

A commercial copy similar to the Sionics, Inc. M14SS suppressor was made before 1999 by Don Floyd, Inc. (Woodstock, GA). The Floyd Mod 14 suppressor had a relief valve at the rear end. At least 179 were made. Advanced Armament Corporation (Norcross, GA) produced a three prong M14 muzzle adaptor in May 2008 for its 762-SD sound suppressor.

Tim Bixler at South Central Research Corporation (Katy, TX) makes a sound suppressor for the M14 type rifle. It is called the Mk23 and can be taken apart for cleaning. Jet Suppressors (Aransas Pass, TX) offers a .308 Winchester caliber sound suppressor that can be threaded on to the M14 barrel flash suppressor nut threads. The titanium sound suppressor is seal welded. It measures 1.5 " in diameter and 9 " long. It is cleaned by soaking in solvent then air dried.

Troy Industries sold an optional sound suppressor for the Rock SOPMOD M14. It was made of fusion welded and stress relieved AISI 300 series stainless steel. The M14 sound suppressor weighed 22 ounces and had a diameter of 1.5 ". It was 10 " long but only added 5 " to the overall length of the firearm. The sound suppressor screwed on the barrel with left hand threads and self-tightened as the rifle was fired. The Rock SOPMOD M14 conversion allowed installation of the Troy Industries sound suppressor without modifying the gas system. This was because the Troy Industries suppressor was built with a back chamber to accommodate the gas. The Rock SOPMOD M14 would operate normally without harm while this suppressor was in use. The Troy Industries sound suppressor reduced sound level by 30 decibels or better when installed on a Rock SOPMOD M14.

Suppressed Tactical Weapons, Inc. (Rougemont, NC) offers a sound suppressor that screws on or permanently attaches to the USGI design M14 flash suppressor. The titanium STW suppressor weighs 14 ounces. The suppressor dimensions are 8.5 " long and 1.315 " in diameter. The advantage of this suppressor is that the front sight is not removed from the rifle.

Surefire, LLC (Fountain Valley, CA) offers two sound suppressors for the M14 type rifle. The Surefire sound suppressors weigh 1 pound 3 ounces and are both 1.5 " in diameter. They are available in a black finish for civilian sales. The sound suppressors can be quickly installed by use of a model specific Surefire suppressor adapter. For the M14, Surefire offers a flash hider adapter (part number FH762KM14) for its FA762K suppressor or a muzzle brake adapter (part number MB762SS01) for its FA762SS suppressor. The FA762K suppressor is 8.4 " long and extends past the muzzle by 5.6 " when installed with a Surefire adapter. The FA762SS suppressor measures 9.8 " long but only adds 5.5 " to the rifle length when installed. Surefire, LLC sells its sound suppressors with a lifetime warranty under normal use and conditions. In 2006, Surefire, LLC supplied a limited number of FA762K sound suppressors and FH762KM14 adapters to the U. S. Navy for the Mk 14 Mod 1 rifle. The FH762KM14 and MB762SS01 adapters are made from heat treated stainless steel and given a black finish.

In 2006, Gemini Technologies introduced its .308 Winchester caliber HVT sound suppressor. The HVT suppressor is made from stainless steel. It has a flat black oxide finish. The HVT sound suppressor has an overall length of 8.25 ", a diameter of 1.5 " and it weighs 24 ounces. The HVT suppressor is fitted to the M14 type rifle by use of the Gemini Technologies quick mounting flash hider type adapter. The flash hider type adapter adds 0.85 " and 4 ounces to the length and weight of the suppressor.

Foreign Suppressors – BR-Tuote (Joensuu, Finland) produces a line of suppressors for pistols, rifles and automatic weapons. Its all steel construction T6M14 suppressor screws onto the M14 barrel once the flash suppressor assembly is removed. These suppressors are self-cleaning.

**USGI M14 Technical Documentation**

Parts and accessories for the M14 rifle were manufactured according to government drawings and item specific military specification documents covering requirements not listed in the drawings. The government agency awarding a particular contract sent the latest Technical Data Package for the item to be made to the contractor. This practice continues to the present day.

The centerline for the M14 rifle is the center of the barrel gas port. The gas port itself is centered between two bore rifling lands. All the dimensions for the M14 are referenced from that datum line.

Part drawings for many M14 parts date to as early as 1954 and were updated until at least June 17, 1994 (drawing B7267096 Revision L). Virtually every M14 part drawing has been revised several times since 1958 when the original technical data package was assembled. A typical example is the operating rod spring guide drawing D7267027, originally dated October 04, 1954. It was redrawn and revised on July 10, 1958 at Springfield Armory. Through the years, this drawing has been revised many times. Drawing D7267027 was last updated by Picatinny Arsenal on April 01, 1979 as Revision M. The bolt may have been revised the most times, Revision Y to drawing F7790185 was issued on December 30, 1992. At least one M14 part drawing made its way into the computer age. Drawing C7267007 for the stock swivel bracket was last revised on August 30, 1993 using Computer-aided Design.

Although Computer-aided Design (CAD) drawings were first used in the 1960s by the automobile and aerospace industries, the M14 project drawings were done by hand with a rare exception as noted above. Before the advent of CAD, firearms designers and ordnance engineers drew parts by hand. The parts were machined, inspected, heat treated, assembled and tested. This process was repeated until the desired results were achieved. There was no magic in firearms design and manufacturing, just a lot of thought and effort. A couple gentlemen serve as fine examples of the talent involved in the production of the M14 rifle.

Mr. Albert A. Cole, Jr. was an ordnance engineer at Springfield Armory. Mr. Cole managed the draftsmen who drew and updated the drawings for the M14 project. He also worked with production employees at the four M14 manufacturers in testing and evaluating design changes to the M14 rifle. Most of the hundreds of refinements were minor but were made for the purpose of reducing the manufacturing cost. After Springfield Armory closed in 1968, Mr. Cole went to work at Picatinny Arsenal and later at Rock Island Arsenal. After his years of public service, he was employed by Sturm, Ruger & Co. in designing firearms before retiring in 1988.

One of the designers that worked for Mr. Cole was Guilio V. Savioli. Mr. Savioli immediately went to work at Springfield Armory upon graduating from high school. He designed the M1E3 bolt which featured the bolt roller later adopted in the M14. During the rain test of a T44, the barrel channel in the stock became flooded. So, Mr. Savioli solved the problem by designing the 5/16 " diameter hole into the bottom of the stock just forward of the sling swivel. He also designed the pre-'61 cleaning kit combination tool. After Springfield Armory closed in 1968, he worked at the Rodman Laboratory at Rock Island Arsenal and then at Picatinny Arsenal. He retired with thirty years of government service and at least eleven U. S. Patents to his credit.

All of the documents associated with manufacturing the M14 rifle are listed in a Technical Data Package List (TDPL). The M14 Rifle TDPL organizes the documents into five areas: 1) product (parts) drawings and associated lists (164 pages) 2) packaging drawings and documents (15 pages) 3) inspection drawings and documents (1034 pages) 4) specifications and standards (102 documents) and 5) outstanding approved engineering changes (29 pages). Similarly, the M21 Rifle TDPL consists of the following: 1) product drawings and associated lists (211 pages) 2) packaging drawings and documents (16 pages) 3) inspection drawings and documents (1,116 pages) 4) specifications and standards (95 documents) and 5) outstanding approved engineering changes (30 pages).

Specifications and standards in the TDPL fit into one of two broad categories, government and commercial. The government standards and specifications are identified by a MIL, DOD, FED or two letter prefix, e.g., MIL-W-12332 or QQ-S-698. A standard, in contrast to a specification, is denoted by STD in the second part of the document identifier, e.g., FED-STD-595. From 1989 onward, the M14 and M21 TDPLs include commercial standards and specifications from these professional organizations: American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), American Society for Testing and Materials (ASTM), American Welding Society (AWS) and the Society of Automotive Engineers (SAE-AS and SAE-AMS). In 1989, the U. S. military services began to adopt commercial manufacturing standards and specifications as they ceased maintaining equivalent federal and military documents. As of 2006, forty-seven of the 102 M14 Rifle TDPL standards and specifications were commercial documents.

Up until the Iran-Contra affair in 1987, the entire M14 Technical Package was available for civilian purchase from the U. S. government for less than $1000.00. This information is now made available to businesses with a CAGE Code which have a need for it or firms that are asked to bid on an item that the U. S. government needs. The item contract up for bid will come with the associated drawings and specifications. The term “mil spec” is not a trademark or other protected descriptive term, but is often used freely by sellers when describing firearms parts of uncertain origin or even clearly from non-military sources, so buyers must beware.

The U. S. Army, U. S. Marine Corps and U. S. Navy have published approximately thirty operations, maintenance, repair and inspection manuals for their M14 rifles. Every M14 type rifle owner should own a copy of 1972 edition TM 9-1005-223-34 as reference material because it is comprehensive and readily available. Rock Island Arsenal drafted an operator’s manual for the XM21 rifle, DTM 9-1005-221-10, but it was never adopted for distribution. Rock Island Arsenal did the original printing for the May 1967 edition of TM 9-1005-223-20. For the most part, the M14 series technical manuals were printed or reprinted by either the Government Printing Office or the Army Adjutant General’s Office.

**Table 21: U. S. Military M14 Publications**

| Subject | Number or Title |
|---|---|
| M14 - match conditioning procedures | Accurized National Match M-14 Rifle “M-14 (MTU-NM)"<br><br>Accurizing the M14 Service Rifle<br><br>TI-02648A-25/10C |
| T44E4 - operator’s manual | SA-NM11-2612 |

| | |
|---|---|
| M14 and M15 rifles - operator's and maintenance manual | Special Text 7-179 |
| M14 rifle - factory quality assurance inspection | ORDP-608-R-SA1 |
| M14 rifle - operator's and organizational maintenance manual with parts and tools list | TM 9-1005-223-12P |
| M14 rifle - operator's and organizational maintenance manual | TM 9-1005-223-12 |
| M14, M14E2 and M14A1 rifle - operator's manual | FM 23-8 |
| M14 - parts list | SL-4-02648A |
| M14 and M2 bipod - operator's and organizational maintenance manual | TM 9-1005-223-12 |
| M14 and M2 bipod - operator's and organizational maintenance manual | TM 9-1005-223-12 |
| M14 and M14E2 and M2 bipod - operator's and organizational maintenance manual | TM 9-1005-223-12 |
| M14 and M14A1 - marksmanship training | FM 23-16<br>FM 23-8 |
| M14 NM - factory inspection procedure | SA-SIP-7790476 |
| M14 and M14A1 and M2 bipod - organizational maintenance manual | TM 9-1005-223-20 |
| M14 NM and M14 M - operator's and organizational maintenance manual with parts and tools list | TM 9-1005-223-12P |
| M14 and M14A1 and M2 bipod - direct support through depot maintenance manual | TM 9-1005-223-35 |

| | |
|---|---|
| XM21 - operator's manual<br><br><br>M21 and M24 - operator's manual<br><br>M21 - operator's manual | TC 23-14<br><br>DTM 9-1005-221-10<br><br>TC 23-14<br><br>FM 23-10 Sniper Training Appendix B |
| M14 - organizational maintenance manual | SW 370-BK-MMI-20 |
| M14SSR - operator's manual | SW 370-BG-OPI-010 |
| M14 DMR - operator's manual | TM 02648C-10/1 |
| Mk 14 Mod 0 - operator's manual | SW 370-A2-OPI-010 |
| M14 and M2 bipod - depot maintenance manual | DMWR 9-1005-223 |
| M14 and M14A1 and M2 bipod - operator's manual | TM 9-1005-223-10 |
| M14 and M14A1 and M2 bipod - organizational maintenance manual | TM 9-1005-223-20 |
| M14 DMR - organizational and intermediate maintenance manual with parts and tools list | TM 02648C-24&P/2 |
| M14 and M2 bipod - direct support through general support maintenance manual | TM 9-1005-223-34 |
| M14 and M2 bipod - direct support through general support maintenance manual | TM 9-1005-223-34 |
| M14 and M14A1 and M2 bipod - direct support through general support maintenance manual | TM 9-1005-223-34 |
| M14 DMR - building procedures | TM 02648C-35/10 |
| M14 - manual of arms | FM 2-5 Drill and Ceremonies<br><br>FM 3-21.5 Drill and Ceremonies Appendix C |

**Timeline of U. S. Army M14 Field Manuals**

December 07, 1959 - FM 23-8 issued.
May 20, 1960 - FM 23-8 1959 edition Change 1 issued.
August 15, 1962 - FM 23-8 1959 edition Change 2 issued.
May 07, 1965 - FM 23-8 issued, supersedes 1959 edition and all associated changes.
March 22, 1968 - FM 23-8 1965 edition Change 1 issued.
April 15, 1974 - FM 23-8 issued, supersedes 1965 edition and associated change.
August 27, 1975 - FM 23-8 1974 edition Change 1 issued.
March 16, 1987 - FM 23-8 1974 edition Change 2 issued.

**Timeline of U. S. Army M14 Technical Manuals**

July 31, 1959 - TM 9-1005-223-12P issued.
October 28, 1959 - TM 9-1005-223-12 issued.
November 1959 - TM 9-1005-223-35P issued.
November 05, 1959 - TM 9-1005-223-34 issued.
1960 - TM 9-1005-223-12 1959 edition is reprinted.
September 15, 1960 - TM 9-1005-223-34P issued.
November 22, 1960 - TM 9-1005-223-20P is issued.
May 26, 1961 - TM 9-1005-223-12 issued, supersedes October 1959 edition.
September 07, 1961 - TM 9-1005-223-34 issued, supersedes November 1959 edition.
September 25, 1961 - TM 9-1005-223-35P issued, supersedes November 1959 edition.
November 15, 1961 - TM 9-1005-223-12 1961 edition Change 1 issued.
March 16, 1962 - TM 9-1005-223-12P issued.
1963 - TM 9-1005-223-12/P M14 NM issued.
January 22, 1963 - TM 9-1005-223-12 issued, supersedes 1961 edition with associated change and TM 9-1005-223-12P 1962 edition.
April 08, 1963 - TM 9-1005-223-34 issued, supersedes 1961 edition.
January 22, 1964 - TM 9-1005-223-12 1963 edition Change 1 issued.
February 08, 1965 - TM 9-1005-23-12 issued, supersedes 1963 edition with all associated changes.
August 16, 1965 - TM 9-1005-223-35 issued.
October 01, 1965 - TM 9-1005-223-12 1965 edition Change 1 issued.
March 23, 1967 - TM 9-1005-223-12 1965 edition Change 2 issued.
March 23, 1967 - TM 9-1005-223-35 1965 edition Change 1 issued.
May 19, 1967 - TM 9-1005-223-20 issued, supersedes TM 9-1005-223-12 1965 edition with all associated changes.
September 14, 1967 - TM 9-1005-223-35 1965 edition Change A issued for the U. S. Marine Corps.
December 29, 1967 - TM 9-1005-223-20 1967 edition Change 1 issued
January 02, 1968 - TM 9-1005-223-35 1965 edition Change B issued for the U. S. Marine Corps.
February 06, 1968 - TM 9-1005-223-20 1967 edition Change 2 issued

February 23, 1968 - TM 9-1005-223-12P M14 NM and M14 M manual issued, supersedes 1963 edition.
June 1968 - TM 9-1005-223-20 1967 edition Change 3 issued
July 01, 1968 - TM 9-1005-223-35 issued, supersedes 1965 edition with all associated changes.
July 02, 1968 to February 02, 1970 - TM 9-1005-223-35 1968 edition Change 1 issued.
1969 - TM 9-1005-223-20 1967 edition is reprinted.
June 1969 - TM 9-1005-223-35 1968 edition is reprinted.
June 20, 1969 - TM 9-1005-223-20 1967 edition Change 4 issued
October 1969 - TC 23-14 issued.
November 1969 - DTM 9-1005-221-10 issued as a draft version.
December 15, 1969 - TM 9-1005-223-20 1967 edition Change 5 issued
1970 - TM 9-1005-223-12P 1968 edition is reprinted.
February 03, 1970 - TM 9-1005-223-35 1968 edition Change 2 issued.
July 14, 1970 - TM 9-1005-223-35 edition Change 3 issued.
1971 - TM 9-1005-223-35 1968 edition with Changes 1, 2 and 3 is reprinted.
January 1971 - TM 9-1005-223-20 1967 edition Change 6 issued
July 1971 - TM 9-1005-223-35 1968 edition is reprinted.
March 21, 1972 - TM 9-1005-223-10 issued, supersedes portions of TM 9-1005-223-20 1967 edition.
August 02, 1972 - TM 9-1005-223-20 issued, supersedes 1967 edition with all associated changes.
August 02, 1972 - TM 9-1005-223-34 issued, supersedes TM 9-1005-223-35 1968 edition with all associated changes.
October 06, 1972 - TM 9-1005-223-10 1972 edition Change 1 issued.
April 20, 1973 - TM 9-1005-223-12P M14 NM and M14 M manual Change 1 issued.
May 08, 1973 - TM 9-1005-223-10 1972 edition Change 2 issued.
1975 - TM 9-1005-223-10 1972 edition is reprinted.
1976 - TM 9-1005-223-34 1972 edition is reprinted.
1980 - TM 9-1005-223-34 1972 edition is reprinted.
June 14, 1989 - TC 23-14 Sniper Training and Employment issued.

Note: The technical manuals currently in use by the U. S. Army are as follows:

M14 and M14A1 - 1972 editions of TM 9-1005-223-20 and TM 9-1005-223-34
M14 M and M14 NM - 1968 edition of TM 9-1005-223-12P with Change 1

Publication dates obtained for U. S. Navy and U. S. Marine Corps manuals were as follows:

November 27, 1972 - U. S. Marine Corps: TI-02648A-25/10B Match Condition Procedures Rifle, 7.62MM, M14
April 16, 1981 - U. S. Marine Corps: TI-02648A-25/10C Match Condition Procedures Rifle, 7.62MM, M14

July 31, 2000 - U. S. Marine Corps: TM 02648C-24&P/2 Organizational and Intermediate Maintenance Manual Including Repair Parts And Special Tool Lists For Rifle 7.62-MM, M14, DMR W/E 1005-01-458-6235
October 01, 2002 - U. S. Navy: SW370-A2-OPI-010 Operator's Manual for Rifle, 7.62MM MK 14 MOD Enhanced Battle Rifle (EBR)

**Table 22: U. S. Military Publications for M14 Related Items**

| Accessory | Number or Title | Issue Date dd/mm/yy or mm/yy |
|---|---|---|
| M4, M5, M6 and M7 bayonets with M8A1 scabbard - operator through depot maintenance manual with parts and tools list | TM 9-1005-237-15P | 12/18/64 |
| M6 and M7 bayonets with M10 scabbard - organizational and direct support maintenance manual with parts and tools list | TM 9-1005-237-23&P | 11/18/86 |
| M6, M7 and M9 bayonets with M10 scabbard - organizational and direct support maintenance with parts and tools list | TM 9-1005-237-23&P | 01/11/93 |
| M7A3 and M76 grenade launchers and M15 sight - operator through general support maintenance manual with parts and tools list | TM 9-1005-234-14P | 10/06/67 |
| Sionics, Inc. M14 SS-1 sound suppressor | Operation and Maintenance Manual for the Noise and Flash Suppressor Assembly M14 SS-1 | M14 NM - not available XM21 - 12/69 |
| Small Arms Field Maintenance Shop Set (FSN 4933-754-0664) | SM 9-4-4933-A13 | |
| Basic Small Arms Field Maintenance Tool Kit (FSN 4933-775-0366) | SM 9-4-4933-E04 | |
| Small Arms Repairman's Tool Kit (FSN 5180-357-7770) | SM 9-4-5180-A57 | |

**Table 23: U. S. Military Publications for M14 Optical Sights**

| Optical Sight | Number or Title | Issue Date dd/mm/yy or mm/yy |
|---|---|---|
| XM21 Adjustable Ranging Telescope | Adjustable Ranging Telescope (ART) Mounted on the Match Conditioned 7.62 mm M-14 Rifle | 09/68 |
| AN/PAS-4 - operation and maintenance manual for Varo, Inc. model | TM 5-1090-200-15 | 02/09/62 Change 1 05/06/63 Change 2 06/08/64 |
| AN/PAS-4 - Varo, Inc. model maintenance manual with parts and tools list | TM 5-1090-200-25P | 01/22/62 |
| AN/PAS-4 - operation, maintenance and overhaul manual for Polan Industries model | Operation, Maintenance and Overhaul Manual, Model P-155 | |
| AN/PVS-1 - operator's manual | TC 23-11 | 11/66 |
| AN/PVS-1 - organizational through general support maintenance manual with parts and tools list | TM 11-5855-236-24P | 12/71 |
| AN/PVS-2, 2A and 2B - operator's manual | TM 11-5855-203-10 | 08/29/74 Change 1 04/13/76 |
| AN/PVS-2 - operator through direct support maintenance manual | TM 11-5855-203-13 | 04/10/68 |

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|---|---|---|
| AN/PVS-3 and AN/PVS-3A - operator's manual | TM 11-5855-209-10 | 12/28/67 Change 1 06/21/69 Change 2 05/19/70 Change 5 in effect |
| AN/PVS-3 and AN/PVS-3A - organizational and direct support maintenance manual | TM 11-5855-209-23 | 02/20/68 Change 5 in effect |
| AN/PVS-3 and AN/PVS-3A - general support and depot maintenance manual with parts and tools list | TM 11-5855-209-40P | 04/18/72 |
| AN/PVS-2, 2A, 3 and 3A - procedure for determining serviceability | TB 11-5800-212-24 | 08/20/73 |
| AN/PVS-4 - operator's manual | TM 11-5855-213-10 | 12/31/76 09/13/85 (reprinted in 1990) 02/01/93 |
| AN/PVS-4 - organizational and direct support maintenance manual with parts and tools list | TM 11-5855-213-23&P | 06/01/93 |
| AN/PAQ-4 - operator's manual | TM 11-5855-261-10 | 05/28/81 |
| AN/PAQ-4 - organizational and direct support maintenance manual | TM 11-5855-261-23 | 10/21/81 |
| AN/PAQ-4 - organizational and direct support maintenance manual with parts and tools list | TM 11-5855-261-23P | 10/23/81 |
| AN/PAQ-4A - operator's and organizational maintenance manual with parts and tools list | TM 11-5855-297-12&P | 09/15/90 Change 1 in effect |

| | | |
|---|---|---|
| AN/PAQ-4B and AN/PAQ-4C - operator's and organizational maintenance manual with parts and tools list | TM 11-5855-301-12&P | 05/15/00 |
| AN/PEQ-2A - operator's and organizational maintenance manual with parts and tools list | TM 11-5855-308-12&P<br>TM 10271A-23&P/2 | 05/15/00 |
| AN/PVS-10 - operator's and organizational maintenance manual with parts and tools list | TM 11-5855-303-12&P | 03/01/03 |
| AN/PVS-14 - operator's manual | TM 11-5855-306-10<br>TM 10271A-10/1A | 06/01/00 |
| AN/PVS-14 - organizational and direct support maintenance manual with parts and tools list | TM 11-5855-306-23&P<br>TM 10271A-23&P/2 | 06/01/00 |

Beginning in June 1951, the U. S. Army has produced an equipment maintenance periodical in comic book format for its soldiers. Through the years, *PS The Preventive Maintenance Monthly* has been produced at Aberdeen Proving Ground (MD), Fort Knox (KY), Raritan Arsenal (NJ) and Redstone Arsenal (AL). Issues back to 1990 are also available online. Through its history, *PS* magazine has had two characters, Miss Connie Rodd (no later than April 1954 to the present) and Master Sergeant Half-Mast (no later than July 1954 to the present). Both characters instruct soldiers on proper care of all sorts of equipment. Specifically, there were more than sixty articles related to M14 rifle care and maintenance in the issues between December 1958 and July 1971. The August 1989 article included cleaning tips for the M14/M21. Basic preventive maintenance was covered in July 2006 and magazines and a M14 scope mount was mentioned in the June and September 2006 issues.

Nicolaus Associates (Jefferson, GA) has reprinted many hard-to-find U. S. military small arms documents including some of the early U. S. Army M14 manuals. Nicolaus also offers several informative wall posters compiled from government documents: 1) M14 Be Your Own Inspector 2) Rifle, 7.62 MM, M21 Sniper's 3) Rifle, 7.62 MM, M14 National Match: Initial Specifications 4) Rifle, 7.62 MM, M14: Cycle of Operation and 5) Rifle, 7.62-MM, M14 Nomenclature. William J. Ricca Surplus Sales has compiled all of the relevant *P S Magazine* articles from 1951 to 1973 on the M14 onto a compact disc. The efforts of William J. Ricca and Eric Nicolaus ensure that technical data on the M14 will remain available to those interested.

**USGI Parts**

Parts for the 1957 design U. S. government M14 rifles were made from December 1958 onward until at least 2008. The bulk of the parts production was, however, from 1960 to 1967. The government contractors involved were held to strict quality control standards. Requirements for correct dimensional geometry, surface roughness and finish, and heat treatment were specified in the applicable Quality Assurance Provisions and Supplementary Quality Assurance Provisions associated with each part. For example, the USGI M14 extractor had twenty-two inspection points for proper dimensional geometry. Still, there are often slight but significant differences in how USGI parts fit, e.g., bolts and operating rods with respect to the receiver. USGI bolts have been found to differ by as much as 0.004 " in length even when made by the same manufacturer.

The USGI drawing specified steel material for the following parts is listed as follows:

**Table 24: Material Selection for USGI M14 Parts**

| USGI M14 Rifle Part | Specified Material |
|---|---|
| barrel (parts 7790190, 7791362, 9345206 and 9349847) | chromium-molybdenum-vanadium or 4150 resulphurized alloy steel heat treated to 30 to 35 HRC |
| bolt | 8620H alloy steel |
| bolt lock | 8620 alloy steel for wrought material and precision casting |
| bolt lock spring | QQ-W-470 wire steel |
| bolt roller | ASTM A681 tool steel |
| bolt roller retaining ring | ASTM A228 steel wire |
| burr, M14A1 stock | 1045, 1050 or 1055 carbon steel spheroidized annealed |
| butt plate | aluminum per QQ-A-250 |
| bushing, M14A1 stock swivel rear | 1018 through 1022 carbon steel per QQ-S-634 |
| butt plate cap | 7075 T6 alloy aluminum |
| butt plate cap pin | 1050 through 1095 carbon steel |
| butt plate flapper, M14 | .17 to .24 carbon content steel drawing quality per QQ-S-698 |
| butt plate flapper, M14A1 | 1060 or 1065 carbon steel |
| butt plate hinge block | 6061 alloy aluminum |
| butt plate hinge spring | QQ-W-470 wire steel |

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|---|---|
| butt plate screw nut retainer | 1050 through 1070 carbon steel |
| butt swivel | 1018 through 1022 or 1141 carbon steel |
| cartridge clip guide | 4140 or 8620 alloy steel |
| connector | 8645, 8740, or 8742 alloy steel heat treated to 36 to 41 HRC |
| connector lock | 1018 carbon steel |
| ejector | 1060 carbon steel with fracture grain size 7 or finer |
| ejector spring | ASTM A228 cold drawn high carbon music spring wire |
| extractor | 8645 or 8740 alloy steel grain size 7 or finer |
| extractor spring | QQ-W-470 wire steel |
| extractor spring plunger | 1060 through 1095 carbon steel |
| firing pin, third version | 8640 or 8645 or 8740 spheroidized alloy steel with complete chromium plating |
| flash suppressor, late | 4140 alloy steel for wrought material<br><br>4140 alloy steel with carbon content 0.43 to 0.53 % for precision casting |
| flash suppressor nut | 8640, 8642, 8645, 8740 or 8742 alloy steel austenitic grain size 5 to 8 |
| front band | 1035 or 1050 carbon steel heat treated to 30 to 35 HRC |
| front sight | heat treated to 42 to 45 HRC:<br><br>8640, 8740 or 4150 alloy steel for wrought material<br><br>4140 alloy steel with carbon content was 0.43 to 0.53 % for precision casting |
| gas cylinder | 416 stainless steel with contents of 0.50 % or less in copper, 0.04 % or less in phosphorus, and 12.00 to 13.50 % in chromium |
| gas cylinder lock | 4150 alloy steel |
| gas cylinder plug | 416 stainless steel heat treated to 32 to 40 HRC |

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|---|---|
| gas piston | originally 416 stainless steel but later changed to 420 stainless steel with no more than 0.5 % copper content<br><br>440 stainless steel for M14SE gas pistons |
| grommet, M14A1 stock | rubber composition |
| hammer | 8620H alloy steel austenite grain size 5 or smaller and heat treated to 80 to 83 HRA hardness |
| hammer pin | 1060 through 1080 carbon steel |
| hammer spring | ASTM A228 cold drawn high carbon music spring wire |
| hammer spring housing | 1112, 1117 or 1212 carbon steel |
| hammer spring plunger | 1112, 1117 or 1020 carbon steel |
| hand grip, M14A1 stock | rubber coating |
| hand grip block, M14A1 stock | 8640 alloys steel |
| magazine body (tube) | 1050 spheroidize annealed drawing quality carbon steel and heat treated to 71 to 76 HRA hardness |
| magazine filler (late version) | cold rolled steel heat treated to No. 4 temper per QQ-S-698 |
| magazine floor plate | ASTM A109 carbon steel (no more than 0.25 % carbon) and heat treated to 71 to 76 HRA hardness |
| magazine follower and stop | Federal Specification QQ-S-698 drawing quality carbon steel and heat treated to file hard |
| magazine latch | 8615 alloy steel for wrought material and 8620H alloy steel for precision casting, heat treated to file hard |
| magazine latch spring | QQ-W-470 wire steel |
| magazine spring | ASTM A228 cold drawn high carbon music spring wire |

| | |
|---|---|
| operating rod | 8645H alloy steel (Gun Quality) with austenite grain size 7 or finer for the handle portion<br><br>8645H or 8742H for the tube portion<br><br>Both portions heat treated to 40 to 46 HRC |
| operating rod guide | 4140, 8640, 8645 or 8740 alloy steel |
| operating rod spring | 17-7 precipitation hardening stainless steel wire |
| operating rod spring guide (solid USGI version) | forged 8640 or 8645 alloy steel and heat treated to 40 to 45 HRC |
| operating rod spring guide (USGI version with holes) | stamped 8640 or 8645 alloy steel and heat treated to 40 to 45 HRC |
| rear sight aperture | 1141 carbon steel forging or 1040 carbon steel seamless tubing |
| rear sight base | 1141 carbon steel heat treated to 45 to 50 HRC |
| rear sight cover | 1055 or 1065 carbon steel austenitic grain size 5 or finer |
| rear sight elevation dog retainer | number 3 temper (quarter hard) carbon steel per QQ-S-698 or ASTM A109 |
| rear sight elevation knob | 1016 through 1020 or 1117 carbon steel or 8615 alloy steel |
| rear sight elevation pinion | 1037 or 1141 carbon steel |
| rear sight nut | 1141 carbon steel |
| rear sight nut lock | ASTM A109 carbon steel |
| rear sight spring | 1095 carbon steel spheroidize annealed |
| rear sight windage knob | 1022 or 1117 carbon steel |
| recoil pad, M14A1 stock | synthetic rubber molded over ASTM A109 sheet steel |
| recoil pad plug, M14A1 stock | synthetic rubber |
| safety | 1021 carbon steel for wrought material<br><br>8620 alloy steel with 0.08 to 0.18 % carbon content or 1020 for precision casting |
| safety spring | ASTM A504 wire steel |

| | |
|---|---|
| screw, M14 stock upper butt | 1018, 1020 or 1117 carbon steel per ASTM A108 |
| screw, M14A1 stock hand grip screw (late version) | 1020 carbon steel per ASTM A108 |
| screw, M14A1 stock recoil pad lower | 1018 to 1020 or 1117 carbon steel |
| screw, M14A1 stock recoil pad upper | 1018, 1020 or 1117 carbon steel per ASTM A108 |
| sear | 8620 alloy steel except sulfur content is 0.035 to 0.050 % with austenite grain size 5 to 8 |
| sear release | 8615 alloy steel for wrought material<br><br>8620 alloy steel except 0.10 to 0.20 % carbon content for precision casting |
| selector shaft | 1141 carbon steel or 8645 alloy steel |
| selector shaft lock | 1025, 1117 or 1118 carbon steel heat treated to file hard |
| small arms sling strap, 1986 design | bulked nylon webbing Type II |
| spindle valve | 440A stainless steel |
| spindle valve spring | 302 or 304 stainless steel |
| stock ferrule | ASTM A619 drawing quality steel |
| stock ferrule, National Match | ASTM A109 drawing quality steel |
| stock liner screw | 1035, 1040, 1137 or 1141 carbon steel |
| swivel, M14A1 stock front | 1018 to 1022 or 1141 carbon steel per ASTM A108 |
| swivel, M14A1 stock rear | 1018 to 1022 or 1141 carbon steel per ASTM A108 |
| swivel bracket, M14 stock | ASTM A366 or ASTM A109 dead soft temper carbon steel |
| swivel loop, M14 stock | 1018 to 1022 carbon steel per ASTM A108, A575 or A576 |
| trigger | 8620 alloy steel except sulfur content is 0.035 to 0.050 % with austenite grain size 5 or finer |
| trigger guard | 1060 or 1065 carbon steel |

| | |
|---|---|
| trigger housing | 1141 carbon steel with austenitic grain size 7 or finer |

AISI 440A stainless steel is magnetic and can be heat treated to obtain very high strength, hardness and wear resistance. AISI 440A stainless steel is a martensitic stainless steel. AISI 8645 is a nickel-chromium-molybdenum alloy steel like AISI 8620 steel but it has a much higher carbon content at 0.45 %. This material can be sufficiently hardened and strengthened for parts like the M14 operating rod without the added step of carburizing.

Some USGI M14 parts are marked with manufacturer codes. Typically, the manufacturers stamped the operating rod, bolt, elevation and windage knobs, trigger housing, and hammer. Sometimes, the manufacturer is identified on the stock, flip-up butt plate, operating rod spring guide, trigger guard, front band, gas cylinder, rear sight base, safety and sear release. Examples of such are:

1) Delta-X Corporation rear sight base
2) Harrington & Richardson front band, rear sight base, and safety
3) Killeen Machine & Tool operating rod spring guide, butt plate flapper and trigger guard
4) Olin Mathieson (Winchester) rear sight base
5) Harrington & Richardson, Saco-Lowell, and Springfield Armory gas cylinders.

Springfield Armory gas cylinders are very faintly stamped S A. Gas cylinder markings are generally not visible because the surface finish hides them. M14 NM trigger housings were marked with the last four digits of the rifle serial number to which it was made part of during the accurizing process.

It is possible that Killeen Machine & Tool did not place its manufacturer's marking on each M14 part it made. M14 gunsmith Ted Brown reports that while refinishing a batch of M14 butt plate assemblies he found that seven of the butt plate flappers exhibited identical flaws left by the stamping die. Of the seven flappers, three were marked KMT CO. and four were unmarked.

Butt Plate and Butt Plate Flapper - M1 Garand butt plates used on the T44E4 stocks were made of steel. USGI M14 butt plates were made of alloy aluminum to help reduce the weight of the M14 rifle. The numbers 8 and 10 have been observed on the back side of M14 butt plate trap doors. These may be mold numbers. The USGI M14 butt plate flapper (shoulder rest plate) is made of steel and has one hole on the left side of the hinge as the rifle is pointed down range. Several types of USGI M14 butt plate flappers have been observed. The following classification scheme is presented as a means of cataloging the differences:

Group 1 - These butt plate flappers have bumps around the bottom screw hole only.

Type 1A - round bumps with two weld dimples and no trap door lock
Type 1B - square bumps but no weld dimples
Type 1C - square bumps with two weld dimples

Group 2 - These butt plate flappers have bumps around the top and bottom screw holes.

Type 2A - round bumps with no weld dimples, truncated hinge slot corners, and a raised trap door pin well
Type 2B - square bumps but no weld dimples or welds filled in
Type 2C - square bumps with two weld dimples (Killeen Machine & Tool made this type)
Type 2D - square bumps with two smaller weld dimples

The DOD acceptance stamp (eagle, arrows and three stars) is usually found on USGI M14 chromium plated and National Match barrels, M6 bayonets and M2 bipods. The DOD acceptance stamp, or cartouche, is sometimes found on wood stocks, Winchester gas cylinders, Winchester operating rods with the forward end vent hole and Springfield Armory operating rods. Winchester gas cylinders removed from an unopened tube packed in 1967 had faint DOD acceptance stamps at the rear end of each on the right hand side. The DOD cartouche was used on rifle parts as early as 1953 but certainly was discontinued for M14 rifle parts by 1968 when Springfield Armory closed down. The DOD cartouche was stamped to the M2 .50 BMG machine gun barrel in 1977 and applied with ink to 1980s production Colt M16A2 rifle receivers in the 6,14X,XXX to 6,16X,XXX serial number range.

Bolt Markings - A USGI bolt (and receiver) may or may not have a dimple from a pin punch after successful proof round testing. Replacement bolts were proof round tested using a fixture. Frankford Arsenal and Lake City loaded the proof rounds to 65,000 psi. An inscribed letter M on a USGI bolt means it was examined by magnetic particle inspection. Not all USGI bolts will have the letter M though. USGI M14 bolts have additional stamps besides the part number and bolt manufacturer. The other markings are the material lot and the steel supplier codes. Such an example can be found on a bolt marked 7790186 HRT A20 CDR. These are in order: 1) part number 2) manufacturer code 3) material lot number and 4) steel supplier code. If a manufacturer had only one steel supplier then just the heat treat or material lot code was stamped on the bolt. Other manufacturers consolidated their markings to include both material lot and steel maker. All M14 type rifles properly assembled will have bolts with rollers attached.

The U. S. government Springfield Armory bolt markings can be confused with commercial reproduction Springfield Armory, Inc. bolts. The U. S. government Springfield Armory stamped its bolts in one of two ways, one format for 7790185 marked bolts and another format for 7790186 marked bolts. If the bolt was made by the U. S. government Springfield Armory and it is marked 7790185 it will have the following: 7790185-SA on the first line and the material lot number on the second line, e.g., YO2. U. S. government Springfield Armory bolts made to the 7790186 drawing have this identification scheme: 7790186 on the first line followed and then SA and the material lot number on the second line, e.g., Z1B. USGI M14 bolts made by Winchester have its CAGE Code, 66118, on the second line whether stamped 7790185 or 7790186 on the first line. Textile Machine Works M14 bolts can have the manufacturer code, HRT, either on the first line or the second line of the bolt markings. USGI M14 bolts were stamped with the 7790186 part number by no later than 1962. The 7790185 marking was used on USGI M14 bolts until at least 1961.

There are bolts with counterfeit markings. Ron Smith of Smith Enterprise, Inc. has seen two M14 bolts stamped TRW that were not made by TRW. Most genuine unaltered commercial Springfield Armory, Inc. M1A bolts do not have a pin punch dimple. The M1A bolts marked 7790185 on the top line and SA RRR on the bottom line are an exception to this rule of thumb. Bolts so marked have a visible casting sprue on the bottom side. All USGI bolts were phosphate coated. Any M14 bolt that is bare steel or has a finish other than phosphate coating was not produced that way by the USGI contractor so buyer beware! The bolt installed in the M14 type rifle should be able to pass the slide test as discussed in Kuhnhausen’s manual and have proper lug engagement and proper headspace prior to use.

USGI National Match parts such as the barrel, front sight, and rear sight parts will be marked NM or NM/2A if made after October 1963. The NM marking may be stamped or engraved on USGI National Match barrels. The NM marking is applied by engraving to prevent deforming the inside of the barrel. 1983 vintage Maremont Corporation medium weight National Match barrels, as well as others, will have the engraved NM marking.

Smith Enterprise, Inc. manufactures the extended bolt lock for the M14 EBR (Mk 14 Mod 0) and M14SE projects. It was developed for the U. S. Navy SEALs to facilitate ease of chambering the M14 rifle in cold weather. This extended bolt lock is made of AISI 8620 alloy steel and heat treated to a surface hardness of 60 HRC and given a phosphate coating. The first batch of M14 EBR and M14SE extended bolt locks were marked U. S. on the inboard side. U. S. and Tempe, AZ were placed on the inboard side of the extended bolt locks for the second production lot. Some were stamped MK-14 in serif font on the inboard side as well.

Firing Pin - Three types of M14 firing pins were made. The original firing pins were made of completely phosphate coated AISI 8640 or 8645 alloy steel. The next version was a phosphate coated steel firing pin with a chromium plated tip. These were only made in 1962 and only by Springfield Armory. The second version firing pins were installed in Springfield Armory M14 bolts marked with the part number 7790186. The last version is a fully chromium plated steel firing pin. These were manufactured from 1965 to 1969.

The minimum hardness of the fully chromium plated firing pin is 600 on the Vickers scale or more than 55 HRC. Chromium plating of the firing pin resulted in a change to the NO GO (maximum) firing pin hole width at the bolt face to change from 0.083 " to 0.084 ". Only fully chromium plated firing pins are acceptable for overhaul of the USGI M14 rifle. The benefits of chromium plating are improved wear resistance and lubricity even though the plating on the firing pin is only 0.0002 " to 0.0008 " thick.

Flash Suppressor – There are no manufacturer markings on USGI or commercial reproduction government design M14 flash suppressors but a number of feature differences are discussed below:

1) Barrel Splines and Suppressor Slots - Commercial reproduction flash suppressors can have barrel splines with square ends or round ends. No USGI flash suppressors have been observed with round end barrel splines. The suppressor slots, including the ends, in both USGI and commercial reproduction units vary slightly in width. The slot ends can be rounded or almost square. The M14 flash suppressor drawing, F7791053, allows two different spline end designs.

2) Front Sight Step - Some USGI flash suppressors, e.g., at least some Harrington & Richardson contract units, will have a “step” directly behind the front sight base while other USGI units do not. The presence of the “step”, and the lack thereof, has been observed on commercial reproduction and forged and cast USGI flash suppressors.

3) Muzzle End Bevel - Additionally, some USGI and commercial reproduction flash suppressors have a 45 $^{o}$ beveled muzzle end while others do not. Beveled and non-beveled ends are not indicative of the manufacturer as both type of muzzle end contours have been observed on commercial and USGI cast and forged units. The M14 flash suppressor drawing, F7791053, requires a length of 0.040 " + 0.020 " for the muzzle end bevel. However, USGI M14 flash suppressor muzzle end bevels have been measured as short as 0.037 " and as long as 0.065 ".

4) Cast and Forged Manufacture – Springfield Armory was manufacturing cast flash suppressors as early as 1959 but began producing forged units in September 1960. Flash suppressors made for Harrington & Richardson M14 rifles were cast as observed from New-In-Tube units. Well done finish machining can remove any obvious evidence that the part was made by casting. This is often the case with USGI flash suppressors as they generally have a better finish than commercial reproduction units. The poorer a cast flash suppressor was machined, the more likely the following can be observed: evidence of the casting sprue on the side of the front sight, the longitudinal mold parting line on the suppressor, rough edges on the suppressor slots and a less pronounced circumferential radius in front of the sight base. However, these exterior surface blemishes do not affect the function or reliability of the part. TRW flash suppressors were forged. An experienced machinist equipped with a jeweler’s loop can discern if a flash suppressor was made by casting or forging. If the flash suppressor was formed by forging it is a

USGI unit since commercial reproduction flash suppressors are made by casting.

The best means of determining whether or not a flash suppressor is USGI contract manufacture is to measure it with vernier calipers and compare the readings to the USGI M14 flash suppressor drawing F7791053. If several dimensions are out of tolerance, then the part is likely not USGI contract manufacture.

Operating Rod - The operating rod in the USGI M14 rifle serves three purposes in the cycle of operation: 1) moves the bolt rearward once acted upon by the gas piston 2) moves the bolt forward under spring force from the operating rod spring and 3) engages the connector assembly to facilitate automatic fire. Some Harrington & Richardson, Springfield Armory, and Winchester operating rods do not have a vent hole drilled in the forward end of the cylindrical portion. Three 1961 manufacture new-in-tube operating rods (two Harrington & Richardson and one Winchester) opened for examination had no vent hole. U. S. Army Aberdeen Proving Ground Report No. DPS-471 discusses the testing of twenty-one randomly selected M14 rifles. This testing was performed from September 28, 1961 to January 30, 1962. The Winchester and Springfield Armory operating rods on the rifles in this test did not have the vent hole, but the Harrington & Richardson operating rods did. It appears that Harrington & Richardson added this change to the operating rod beginning in 1961. Springfield Armory and Winchester did likewise after 1961. The vent hole on the forward end of the tube section was added to the drawing with Revision G dated September 29, 1960. Harrington & Richardson operating rods were all marked 7267064 HRA at the forward end of the handle of the portion. Some of the Harrington & Richardson operating rods were also stamped with a material lot number centered below the first marking, e.g., 1, 3 or 5. Harrington & Richardson operating rods made of 8645 steel typically measure 35 to 38 HRC. A random sample TRW operating rod tested in April 2008 measured 42 HRC.

There were at least least two USGI contracts awarded in 1984 for M14 operating rods. The operating rods were made by Mercury Tool & Machine for both contracts. However, Mercury Tool & Machine was a subcontractor to Rock Island Arsenal for one of the two contracts. Mercury Tool & Machine operating rods have the marking: top line - 7267064 bottom line - MFR 24411. Mercury Tool & Machine operating rods sometimes have misaligned factory welds straight out of the wrapper. The welded area is usually easy to see on Mercury Tool & Machine operating rods.

The USGI M14 drawing F7267064 shows the welding of the operating rod handle and cylinder halves together and requires a hole at the front end of the operating rod. The diameter of the hole is specified to be 0.077 " + 0.006 ". The welding techniques for assembling the operating rod were developed in Remington Arms Company in 1951. Only TRW made one piece operating rods for the U. S. government. TRW operating rods have a vent hole at the front end. All other manufacturers of USGI operating rods made operating rods by flash welding the two halves together. The front end of the operating rod that contacts the gas piston is chromium plated for improved impact resistance.

Rewelded USGI operating rods are sold on the surplus market. Many rewelded operating rods will not function smoothly due to misalignment of the two halves. Operating rods should be able to pass the slide test discussed in Kuhnhausen's manual before the rifle is completely assembled.

Gas System – The design of the gas system for the M14 rifle was decided upon after testing in 1954 of the T44E2 rifle. The original cutoff and expansion gas system design later used in the M14 rifle was patented by Joseph C. White in 1933. It was more expensive to manufacture and the tolerances were tighter than the M1 Garand impingement design gas system. This gas system design was tested by the U. S. Army Ordnance Command as early as 1942 in an experimental M1 Carbine. The M14 gas cutoff and expansion design produces a longer dwell time and lower peak pressure with service ammunition than the M1 Garand impingement gas system. Thus, it acts more gently on the rifle than the gas impingement design. The M14 gas piston moves about 1.5 " in operation.

The front band in the gas system serves two purposes: 1) a spacer between the barrel shoulder and the gas cylinder for proper alignment of the gas cylinder to the gas port 2) retention of the stock and hand guard. All variations of the gas cylinder lock serve the purpose of preventing forward movement of the gas cylinder. The gas cylinder plug limits the forward movement of the gas piston and keeps the gas cylinder lock from rotating.

Two versions of the M14 gas cylinder were manufactured. The early version does not have a lip just aft of the bottom gas port to support the front band. The late version (March 1960 design) gas cylinder was manufactured with a support lip for the front band. The lip is 0.095 " wide and 0.112 " high but serves a very important purpose. These early version gas cylinders were used in the production of T44E4 and some M14 rifles. Bill Ricca estimates that 75,000 to 100,000 of the early version gas cylinders were made by Winchester and Springfield Armory.

Some USGI gas cylinders have been observed with these markings: 1) G then T inside a circle followed by L 2) S then T inside a circle followed by L 3) Y then T inside a circle followed by L 4) K then T inside a circle followed by L 5) E then T inside a circle followed by L or 6) T inside a circle. Two gas cylinders marked in the first manner were removed from a Harrington & Richardson marked and sealed cardboard tube dated July 1962. Two gas cylinders marked in the fourth case were removed from a Harrington & Richardson marked and sealed cardboard tube dated 1964. An April 1962 dated tube of two Harrington & Richardson marked gas cylinders to find the marking noted in the fifth case. Thus, these markings appear to denote a production date code. Early version and early production late version gas cylinders were machined from forgings. Rough forgings of gas cylinders were available for sale at gun shows in the 1970s. Late production late version gas cylinders are thought to be made from castings but this has not been confirmed.

Safety Markings - The following safety markings have been observed on USGI M14 safeties: 88 T I, 89 T I, 90 T I, A (raised letter), T I, HA, HB, H&R D, HRA, MXR, O (raised letter), ROBER HT-B, ROBER HT-D, HT-B, HT-D, TRW HT-A, TRW HT-B and TRW HT-D. T I was Tong Industries, H&R was Harrington & Richardson and TRW was Thompson-Ramo-Wooldridge. TRW safeties were marked in two lines of lettering with TRW on the top line. M1 Garand safeties, e.g., SA-9 or SA 11, were factory installed on commercial versions of the M14 rifle. They are are interchangeable with the M14 type rifle.

Springs and Spring Design – The M14 rifle has fifteen springs though some are not readily obvious: bolt lock spring, butt plate hinge spring, butt plate trap door spring, connector assembly spring, elevation knob screw spring, ejector spring, extractor spring, hammer spring, hand guard band, magazine latch spring, operating rod spring, rear sight cover, safety spring, selector shaft spring, and spindle valve spring. The M14 NM has additional springs in the hooded rear sight aperture, two small coil springs and a beryllium-copper alloy snap ring. There is one coil spring in the hand grip assembly of the M14A1 stock. The M14 magazine, M3 breech shield, M6 bayonet, M12 blank firing attachment, and M76 grenade launcher each have one spring as well. The M2 bipod has four springs, one for each plunger button.

There are many types of coil springs, compression, die, extension, torsion, etc. A coil spring is typically made by coiling round wire or thin rod into a helical shape. With the exceptions of the elevation knob screw spring, hand guard band, rear sight cover and the safety spring, M14 type rifle springs are classified as constant diameter compression coil springs. A compression coil spring will resist a force applied straight into the end of the spring. When a compression coil spring is compressed axially (end-to-end), other forces are induced on the spring as well: lateral (side-to-side), a rotating moment and a tilting moment. The constant diameter design means the width of the spring does not vary.

Compression coil springs are further categorized by how the end of the spring is formed and how the material is wound. The end of a constant diameter compression coil spring can be formed in one three ways, tangential or open, squared or closed, and pigtail. The open end spring is cut anywhere along the helix so that there is no change in the pitch or spacing of the coil. The pigtail end means the spring is curled inward on the last coil to a smaller diameter then cut. The closed end spring is formed so that the spring will stand upright when placed on end. Closed end and open end compression coil springs are often ground to create very flat surfaces at each end. The flat ends provide better stability. A ground closed end increases the seating area and reduces buckling for the compression coil spring. The following M14 rifle springs have closed ground ends: ejector spring, extractor spring, hammer spring, operating rod spring and spindle valve spring. The selector shaft spring and bolt lock spring have open ends and are not ground. Magazine latch springs observed have closed ends but do not appear to be ground.

Grinding the end of the spring may be done to better distribute the applied force, make assembly of the parts easier, or in some cases prevent buckling. The free length of the compression coil spring compared to its mean diameter is known as the slenderness ratio. The free length of a compression coil spring is the distance from one end of the spring to the other with no force applied. A compression coil spring with ground closed ends having a slenderness ratio of less than four will not buckle. A compression coil spring with unground closed ends may buckle if the slenderness ratio exceeds 2.63. The slenderness ratios for the bolt lock spring and the extractor spring are 4.05 and 4.03, respectively. It is not known if the slenderness ratio was considered in the designs of the bolt lock spring and extractor spring or if those values were coincidental to any concern for spring buckling.

The direction of the coil spring helix (left-hand or right-hand) is specified in several of the drawings. The bolt lock spring helical direction is optional per USGI drawing F7267074. The USGI drawing C7267078 specifies a left-hand twist for the magazine spring. The USGI drawings for the ejector spring, extractor spring, magazine latch spring and operating rod spring require a right-hand helical direction for each spring. Some USGI contract springs were made with the wrong twist. Such examples are a batch of operating rod springs made in 1983 and Harrington & Richardson contract extractor springs produced in November 1964. If the contractor was able to convince the contracting officer that spring function was not affected, though made with the wrong twist, it was accepted by the U. S. government.

The compression and fatigue strength of a coil spring is dependent upon a number of factors: material composition, wire surface finish, wire diameter and length, coil diameter, total number of coils and heat treatment. Spring manufacturers use a wide variety of materials for coil springs: carbon, alloy and stainless steels, phosphor bronze, copper beryllium alloy and brass depending on the application.

The USGI drawings for the M14 rifle compression coil springs specify the wire material, wire diameter, coil outside or inside diameter, free length, and total number of coils. The USGI drawing B7267079 for the operating rod spring is illustrative of the detailed requirements typical of M14 parts production. Some of the drawing B7267079 specifications are described below.

The operating rod spring material was 17-7 precipitation hardening stainless steel wire per military specification Mil-W-46078 and manufactured under military specification Mil-S-13572 Type 1 Grade B. This material was chosen for the operating rod spring in 1952 as part of the T44 rifle modifications. The physical dimension and performance requirements were as follows: wire diameter equal to 0.054 " + or – 0.001 ", coil outside diameter of 0.4575 " + or – 0.0025 ", free length of 15.23 ", a total of 104 coils, and the direction of the helix must be right-hand wound with closed ends.

The operating rod spring formed by coiling cold drawn wire had to be heat treated as follows: age hardened at 900 degrees Fahrenheit for one hour then air cooled. After that, the operating rod spring was heat set by heating at 700 degrees Fahrenheit for twenty minutes with the spring compressed to a length between 5.9 " and 6.0 ". Heat setting a spring improves the stress relaxation during use. Age hardening is used to increase the strength and hardness of manufactured parts made from certain alloys, e.g., copper-beryllium and 17-7 cold drawn stainless steel. Each material responds differently to the age (precipitation) hardening process based on a combination of time, temperature and the amount of cold drawing from the initial rod size into the final wire diameter. Depending on the material, the toughness, corrosion resistance, fatigue strength, electrical conductivity or thermal conductivity can be improved upon by stopping the hardening procedure before or after the time needed to achieve maximum strength. By age hardening and heat setting the operating rod spring, service life was significantly increased.

The operating rod spring, like other compression coil springs, was designed with a given spring rate. The spring rate, or stiffness, is defined as the amount of load (force) needed to compress the spring one inch. The lower the spring rate the softer the spring. After the operating rod spring had been heat treated and heat set it was compressed to solid length three times and then load tested at several specific lengths. These tests verified the operating rod spring met the design spring rate. The design spring rate for the M14 operating rod spring was 1.95. When the operating rod spring was compressed to a length of 10.97 " the applied load had to equal 8.13 pounds + or – 0.81 pounds. When the operating rod spring was compressed to 6.42 " the required load was 17.00 pounds + or – 1.69 pounds.

When the operating rod spring was compressed to the minimum operating length it measured about 7.19 " long with an applied load less than 16.00 pounds but sufficient to engage the bolt lock. The USGI drawing B7267079 for the operating rod spring specified a maximum length of 5.78 " for the solid compressed length. The design and manufacturing process ensured the USGI M14 operating rod spring would function properly for thousands of cycles. It also means that the minimum force necessary would always be exerted on the operating rod spring guide, and consequently, the magazine full of life sustaining ammunition. The M14 rifle enthusiast or collector should proceed with caution when hearing the term “mil-spec” in casual conversation with such detailed design, manufacturing and testing requirements for USGI M14 parts.

Coil spring material is subjected to torsional (twisting) stress when it is compressed. For a given set of spring dimensions, the varying amounts of applied force and compression distance determine the range of stress the spring will be subject to. Why does this matter? Because the maximum stress and the range of stress will determine the life of the spring. As the maximum stress increases or as the range of stress increases the life of the spring decreases. In other words, a thinner diameter spring or a spring that is compressed over a greater distance from its free length will wear out faster.

When a wire is twisted, the stress is greatest at the surface. Fatigue cracks commonly begin at defects in the spring surface. A very smooth spring surface will prevent fatigue cracking. Consequently, wire surface defects, e.g., pits and seams, are controlled in the cold drawing manufacturing process. For example, Seneca Wire & Manufacturing Company (Fostoria, OH) limits the depth of surface defects in its ASTM A877 chromium silicon alloy steel wire to no more than 1.0 % of the wire diameter. ASTM A877 chromium silicon alloy steel wire is suitable for service applications requiring high fatigue strength at moderately high temperatures, e.g., M14 operating rod spring. Additionally, the USGI drawing C7267078 required the magazine spring to be "free from scratches, splits, laps, cracks, seams, nicks, die marks and other injurious defects." Replacement M14 magazine springs with noticeable nicks, often found on the outside of coil bends, are most likely not pre-1990 manufacture.

The question often arises as to whether or not a compression spring will take a permanent set if compressed to the minimum length and held over time, e.g., a fully loaded magazine or the bolt is held open. Coil springs can be designed to compress to solid height or length without taking a permanent set. The solid height of a compression spring is the length of the spring when fully compressed. If a permanent set is not desired, the spring material and diameter is chosen so that the torsional stress when compressed solid does not exceed approximately 40 % of the material minimum tensile strength. The minimum tensile strength, or yield strength, will vary with the diameter of the wire, e.g., 231,000 to 399,000 psi for ASTM A228 music wire. A permanent set occurs when the compression spring is compressed beyond its elastic limit and does not return to the original length. This results in a shorter free length but more significantly, lower spring force.

M14 magazine springs were tested and inspected to ensure they would not take a permanent set. Magazine springs selected for inspection were compressed to a height of 11/16 ", essentially compressed solid height, three times then examined for compliance with USGI drawing C7267078. This included meeting the free length requirement of 13 " – 2 ". A permanent set in a USGI M14 rifle compression spring is not formed when compressed to the minimum length and left indefinitely.

The majority of the compression coil springs in the M14 rifle are subjected to fatigue stress over a very large number of operating cycles. These springs were designed with this service requirement in mind. If a spring weakens enough the M14 rifle will malfunction in one manner or another. A weak magazine spring could cause cartridge feeding problems. If the extractor spring is weak the spent case may stick in the chamber after firing. A soft ejector spring could result in a spent case being caught between the bolt and receiver. In a combat situation, such malfunctions could prove fatal. Nonetheless, over the course of thousands and thousands of cycles, the free lengths of the operating rod spring and the hammer spring will gradually shorten so that they will warrant replacement. The following example demonstrates the endurance and reliability of the M14 magazine spring.

Check-Mate Industries manufactures the magazine follower assembly, floor plate and tube (body) but the springs are supplied to them. The magazine springs supplied to Check-Mate Industries typically exhibit slight surface nicks on the outboard side of the angled segments of each coil. These surface irregularities appear to be made in the same manner and at the same location and appear identical in dimension and finish. Sample springs examined in post-1991 Check-Mate Industries magazines manufactured over a period of several years possess these surface nicks. The surface nicks were formed by CNC bending machines during manufacture. The same springs were used in both government contract and commercial sale M14 magazines. Even though the magazine springs passed government inspection every time, Check-Mate Industries performed extensive testing on the springs to alleviate consumer concern. Check-Mate Industries found no negative effect on spring integrity or performance due to the presence of these surface blemishes.

By comparison, springs from genuine 1960s production Borg-Warner magazines are smooth in appearance and possess identical dimensions but the free length is about 1/2 " shorter than the springs found in Check-Mate Industries magazines. Before 1992, USGI M14 magazines springs had smooth surfaces with no irregularities visible to the naked eye, regardless of the contractor. What is the requirement for the M14 magazine spring appearance? The USGI drawing C7267078 Note 2 specifies, "Springs shall be free from scratches, splits, laps, cracks, seams, nicks, die marks, and other injurious defects."

Jeff St Paul (Tygh Valley, OR) tested 2006 production Check-Mate Industries magazine springs in December 2006 to determine if they met the USGI drawing spring force requirements at each specified length under compression. The magazine springs met the requirements exactly on each one tested. The magazine springs are heat treated after forming which tends to minimize any effect from minor surface irregularities.

At the same time, Mr. St Paul also performed accelerated use testing to determine what effect the minor die marks would have on magazine spring cycle life. He tested 2006 production M14 magazine springs with minor surface nicks sold by Check-Mate Industries. Spring force measurements were taken after 500 and 1000 cycles (simulation of 10,000 and 20,000 rounds respectively). At both points in the testing, there was no reduction whatsoever in spring force measurements taken at various compressed lengths and no change in the free length. In other words, Check-Mate Industries magazine springs show no degradation after simulating 20,000 rounds of fire. The surface nicks do not appear to have any adverse affect on performance. Thus, they are not an injurious defect and the spring meets the USGI drawing requirement. This is borne out by the fact that every lot of Check-Mate Industries M14 magazines supplied to the U. S. government under contract has exceeded the government conducted firing and corrosion resistance tests and visual inspection. There has never been any rejection of Check-Mate Industries M14 magazines by the U. S. government.

Springfield Armory performed an evaluation of M14 magazine springs in the 1960s. The effects of long-term storage and repeated cycling of magazine spring were studied. The specified load (spring force) for the USGI M14 magazine spring is 5.5 pounds + 0.75 pounds at a compressed length of 5.5 " (unloaded magazine). However, the Springfield Armory tests found that the M14 magazine spring will perform satisfactorily at a load as low as 4.5 pounds force at 5.5 " length.

In the Springfield Armory study, three USGI M14 magazine springs were placed into a vertical shaper for a gymnastication test. Each spring was cycled at a rate of 116 strokes per minute. The spring force was measured after so many cycles, 5, 55, 655, 1,655, etc. After 6,655 cycles, the spring force at 5.5 " long were 6.1, 6.1 and 5.75 pounds each. The load, or force, of each spring was checked again after 10,000 cycles. The results were 5.1, 5.75 and 3.9 pounds at 5.5 " length. One spring measured 5.25 pounds at 5.5 " length even after 12,000 cycles. The springs were found badly distorted at 10,000, 12,000 and 14,751 cycles, respectively.

In another part of the spring evaluation, ten magazines were stored loaded for five years. After the first week in storage, the magazine spring force was found to range from 5.1 to 5.6 pounds at 5.5 " length. After five years of loaded storage, the same ten magazines were test fired with six loadings (120 rounds per magazine). The magazines were then disassembled and the spring force measured. The results were 4.6 to 4.75 pounds for length of 5.5 ". There was no malfunction of any magazine.

Unloaded magazines were tested as well for the effects of long-term storage. Ten magazines were stored unloaded for five years. After the first week in storage, the force for each spring ranged from 8.3 to 8.8 pounds at 5.5 ". After five years, the same ten magazines were loaded and fired six times each (120 rounds per magazine). The force for each spring was then measured. The results ranged from 5.0 to 5.25 pounds at 5.5 " length. There was no malfunction of any magazine.

The spring design must also consider the temperature to which it will be subjected. The gas piston, and to a lesser degree, the operating rod guide, transfer heat to the operating rod and the operating rod spring. Temperature at the forward end of the operating rod has been measured above 500 degrees Fahrenheit. Chromium silicon alloy steel operating rod springs are rated for service to at least 700 degrees Fahrenheit.

The spindle valve spring is heated from burnt gunpowder gas flowing from the barrel into the gas cylinder. The spindle valve spring is made from either AISI 302 or 304 stainless steel to resist the high temperature gas. Stainless steel has a higher maximum service temperature than carbon steel. For example, 17-7 precipitation hardening stainless steel wire is rated for a maximum service temperature of 600 degrees Fahrenheit as compared to 250 and 300 degrees Fahrenheit for hard drawn carbon steel and oil tempered carbon steel, respectively.

The hammer spring is made from American Society of Testing and Materials (ASTM) 228 specification music wire according to USGI drawing B6008887. Music wire is an alloy steel with high carbon content often used for manufacturing springs. Music wire is made by the cold drawing method. It is magnetic.

ASTM 228 music wire is a high carbon steel with hardness ranging from 41 to 60 HRC. It is composed of a minimum of 98.4 % iron and a range of 0.2 to 0.6 % for manganese and 0.7 to 1.0 % for carbon content. ASTM A228 music wire is rated for a maximum service temperature of 250 degrees Fahrenheit. This rating is acceptable since the hammer spring is not intended to operate at that high a temperature. ASTM A877 chromium silicon alloy steel wire and ASTM 228 steel music wire are popular choices for applications requiring excellent fatigue strength such as the M14 rifle hammer spring.

The USGI hammer spring will have twenty coils and a free length of 2.15 ". If the hammer spring has been shortened by cutting, it should not be used but replaced with a new one. Cutting the hammer spring coils increases the chance of an accidental discharge.

Other Parts and Accessories - Both types of M14 trigger guards were stamped from spring steel. The early trigger guard has a pin to act as the hammer stop. The hammer stop pin was brazed to the trigger housing. It was required to withstand an axial load of 500 pounds without failure. The design of the hammer stop in the late trigger guard is a bent tab. The design change occurred in September 1960 but early style trigger guards were still being made by Winchester in January 1962. The trigger guard can be used as an emergency means of cocking the hammer. With the hammer forward and the safety disengaged, the hammer can be cocked by pulling the trigger guard downward and upward similar to a lever action rifle. Springfield Armory triggers often have a numeral, e.g., 4 or 19, on the side. This number represents the forging die used to make the trigger. Springfield Armory manufactured front sights and selector switches by casting.

Extractors were made by forging. If an extractor is made by casting it is a commercial reproduction. Harrington & Richardson and Winchester rear sight bases were often stamped with a code, e.g., B2, B3, B4, B5 or B10. The meaning of this code has not been determined. Springfield Armory marked its NM 2/A rear sight bases on the bottom with SA 7791571.

Operating rod spring guides have one hole at the rear end for the connector lock to slide through. The “spine” of the early version operating rod spring guide was machined with a center channel on either side running most of its length. The channel lightened but strengthened the part. The late version USGI operating rod spring guides had four stadium holes in the “spine” as well as the hole for the connector lock. The late version was less expensive to manufacture. Both versions were hardened to give long service life for the magazine catch. The connector lock secures the operating rod spring guide to the receiver. For comparison purposes, the weight of several versions of the operating rod spring guide are as follows: 1) early USGI – 0.81 ounce 2) late USGI - 0.87 ounce 3) master armorer built NM – 2.10 ounces 3) Brookfield Precision Tool NM – 2.24 ounces 4) Sadlak Industries hollow shaft NM – 1.73 ounces 5) Sadlak Industries solid shaft NM – 2.26 ounces.

The earliest and latest observed dates of manufacture noted for the items in Table 25 were either found by firsthand examination or through photographs of the original packaging. A single entry for an item indicates only one date observed so far.

**Table 25: Observed Manufacture Dates for USGI M14 Rifle Items**

| USGI Contract Item - Spare Part or Tool | Earliest Observed Date of Packaging | Last Observed Date of Packaging |
|---|---|---|
| AN/PVS-4 carrying case | | September 1990 |
| barrel, chromium plated | December 1960 | February 1983 |
| barrel, NM lightweight | April 1966 | June 1985 |
| barrel, NM medium weight | 1983 | 1992 |
| barrel, NM heavyweight | May 1984 | January 1993 |
| barrel cleaning rod patch tip | | March 1967 |
| barrel reflector | | April 1966 |
| bolt with roller | July 1969 | March 1970 |
| bolt lock | March 1962 | December 1966 |
| bolt lock pin | | 1963 |
| bolt roller | | October 1967 |
| bolt roller retainer | | December 1967 |
| bolt roller retaining ring pliers | | November 1965 |
| bore reflector | | April 1966 |
| broken shell extractor | October 1959 | July 1961 |
| cartridge clip guide | | December 1971 (arsenal rewrap) |
| case, cleaning kit rod section | | February 1966 |
| chamber brush, black ratchet | June 1960 | May 1970 |
| cleaning rod section | | September 1968 |

| | | |
|---|---|---|
| combination tool | March 1961 | March 1968 (contract)<br>December 1974 (arsenal rewrap) |
| connector assembly | August 1963 | October 1967 |
| connector lock | | November 1964 |
| connector lock pin | | March 1996 |
| ejector assembly | December 1960 | July 1967 |
| extractor spring assembly | | November 1964 |
| extractor (late design) | | January 1965 |
| firing pin, first version | | December 1961 |
| firing pin, third version | June 1967 | August 1969 |
| flash suppressor | January 1961 | July 1970 |
| flash suppressor nut | March 1961 | July 1961 |
| flash suppressor nut setscrew | | March 1978 |
| flash suppressor nut wrench | | May 1962 |
| front band | December 1961 | December 1972 (arsenal rewrap) |
| front sight screw | | October 1966 |
| gas cylinder | September 1961 | November 1969 |
| gas cylinder lock | April 1962 | May 1966 |
| gas cylinder plug | November 1960 | June 1966 |
| gas piston (non-coated) | February 1962 | October 1967 (contract)<br>June 1972 (arsenal rewrap) |
| gas piston (coated) | July 1993 | September 1995 |
| hammer | March 1963 | September 1974 (arsenal rewrap) |
| hammer spring | August 1966 | May 1981 (U. S. Navy contract) |
| hand guard assembly, solid | May 1964 | August 1967 |
| lubricant case | | October 1961 |

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|---|---|---|
| M2 aiming device | | February 1965 |
| M2 bandoleer | July 1966 | October 1989 |
| M2 bipod | December 1963 | March 1968 |
| M3 breech shield | | June 1973 |
| M5 winter trigger | December 1962 | January 1968 |
| M6 bayonet | April 1962 | December 1968 |
| M6 bayonet grip, left side | December 1966 | April 1967 |
| M6 bayonet grip, right side | August 1964 | July 1966 |
| M12 blank firing attachment, all versions | October 1964 | June 1973 |
| M14E2 muzzle stabilizer modification kit | | July 1967 |
| M14E2 stock modification kit | | April 1968 |
| M76 grenade launcher | July 1961 | August 1961 |
| M151 vehicle M14 rifle mounting kit | May 1967 | November 1969 |
| M1907 leather sling | May 1963 | May 1995 |
| M1956 canvas magazine pouch | September 1959 | FY1969 contract |
| M1961 canvas magazine pouch | FY1962 contract | FY1967 contract |
| M1961 individual equipment belt | | FY1967 contract |
| M1967 nylon magazine pouch for the M14 | FY1970 contract | FY1972 contract |
| M35 truck M14/M16 dual rifle mounting kit | | October 1987 |
| magazine | 1959 | July 2005 |
| magazine latch | February 1960 | December 1963 |
| operating rod | July 1961 | October 1986 |
| operating rod guide | November 1959 | June 1967 |
| operating rod spring | January 1962 | March 1966 |
| operating rod spring guide | March 1961 | July 1967 |
| rear sight aperture, standard | April 1963 | September 1964 |
| rear sight aperture, National Match hooded | | January 1967 |
| rear sight base | February 1962 | April 1976 (arsenal rewrap) |
| rear sight cover | | July 1962 |

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|---|---|---|
| rear sight elevation knob and spindle | April 1962 | November 1965 (M1 knob) |
| rear sight windage knob | | February 1962 |
| safety | January 1962 | June 1969 |
| safety spring | March 1961 | July 1969 |
| selector spring | April 1961 | May 1963 |
| selector switch | October 1960 | March 1967 |
| sling swivel | | March 1968 |
| small arms sling, fabric | April 1964 | 1975 contract |
| spindle valve | January 1962 | August 1969 |
| stock, fiberglass | | January 1968 |
| stock, National Match, 9352638 | | November 1988 |
| stock subassembly, National Match, 11010282 | | August 1966 |
| stock ferrule, National Match | | December 1990 |
| stock repair screws, large | | May 1965 |
| stock screw, wood upper butt | | January 1968 |
| trigger and sear assembly | March 1961 | March 1966 |
| trigger guard | October 1960 | January 1968 (contract)<br>March 1968 (arsenal rewrap) |
| trigger housing | April 1962 | October 1967 |

At least 230 separate U. S. government contracts for M14 parts have been awarded between July 01, 1965 and September 30, 1997. The following dollar amounts only include U. S. government contracts identified for production of M14 spare parts. Some of the records available do not specify the specific type of weapon system associated with the contract. Consequently, those contract amounts were not included in this summary. The actual amount spent for procurement of M14 spare parts is higher. Summary of known outlay on M14 parts contracts: FY61 through FY65 - $13,317,000, FY66 through FY75 - $20,327,000, FY76 through FY83 - $4,048,000, and FY84 through FY97 - $6,566,000. The U. S. government spent a *minimum* of $44,258,000 for the period July 01, 1960 through September 30, 1997 on spare M14 rifle parts. At least nineteen M14 parts contracts were awarded by Rock Island Arsenal in Fiscal Years 2005 through 2008 for a total of at least $850,652.

Springfield Armory made all parts for the M14 rifle but also used subcontractors for various parts in later years. Workers there made production runs of flash suppressors in December 1964 and gas cylinders between July 01, 1964 and June 30, 1965. Between July 01, 1965 and June 30, 1966 the Armory began production to deliver an order of spare M14 parts including 64,000 bolts, 35,000 operating rods, and 12,000 stock assemblies. This spare parts production was expected to be completed by April 1967. Springfield Armory also received an order for 52,700 M14 barrels in Fiscal Year 1967. The first of these barrels were delivered in June 1967 and production continued into October 1967.

Several companies made M14 parts or accessories for Springfield Armory. The marking BRW S-1 indicates the part was made at the Bellwood, Illinois plant of Borg-Warner. The BRW S-1 marking may be stamped upright, upside down or diagonally on genuine USGI M14 magazines. The Borg-Warner Brake Division may have produced the BRW B-2 marked magazines but this has not been confirmed. Borg-Warner made magazines from as early as December 1961 until June 1969. Killeen Machine & Tool Co. produced M14 magazines in 1965 and 1970. BRW, KMT and UHC marked magazines were made for Springfield Armory in the 1960s.

**Table 26: Subcontractors to USGI Contractors**

| Company | Subcontractor to | Parts identified as being made as a subcontractor |
|---|---|---|
| Atwood Vacuum Machine Co. | Springfield Armory | magazine |
| Borg-Warner | Olin Mathieson Chemical Corporation<br>Springfield Armory | magazine |
| Bostich | Harrington & Richardson | |
| Bruce Machine and Engineering | Springfield Armory | windage knob |
| Brunswick Sports Products Co. | Olin Mathieson Chemical Corporation | magazine |
| CCP | Springfield Armory | NM windage knob |
| General Tire | Harrington & Richardson | |

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|---|---|---|
| Hesse Machine & Mfg. Co., Inc. | Olin Mathieson Chemical Corporation | magazine latch |
| Killeen Machine & Tool Co. | Apex Metal Stamping, Springfield Armory, Harrington & Richardson. | magazine for Apex Metal Stamping and Springfield Armory, magazine and butt plate assembly for Harrington & Richardson |
| Lundquist Tool & Mfg. Co. | Olin Mathieson Chemical Corporation | operating rod spring guide |
| Mechanical Components Corporation | Craft Metal Corporation | gas cylinder |
| MXR | Springfield Armory, possibly Olin Mathieson Chemical Corporation | safety |
| Rochester Manufacturing Company | Harrington & Richardson Springfield Armory | magazine |
| S. C. Overton & Co. | TRW | wood stock |
| Saco-Lowell | Springfield Armory, Harrington & Richardson | gas cylinder |
| Sykes Manufacturing | Springfield Armory | wood stock |
| Stanley-Humason | Olin Mathieson Chemical Corporation | safety spring |
| Textile Machine Works | Harrington & Richardson | bolt |
| Torrington Company | Harrington & Richardson | |
| Union Hardware Company | Springfield Armory, Olin Mathieson Chemical Corporation | magazine |
| Westinghouse Electric | Harrington & Richardson, Olin Mathieson Chemical Corporation | magazine |

| | | |
|---|---|---|
| Wico Electric Co. (a division of Eltra Corp.) | TRW | elevation knob |
| Wright Manufacturing Co. | Harrington & Richardson, TRW | windage knob |

Winchester made all the major M14 parts and most of the small parts with the exception of springs, pins and screws. The M14 parts Winchester made equaled 80 % of the value of the rifle at the time. Westinghouse Electric made M14 magazines for Harrington & Richardson in 1961 and Olin-Mathieson Chemical Corporation (Winchester) in 1962. Likewise, Union Hardware Company made magazines in 1967 for Olin-Mathieson Chemical Corporation. Olin (Winchester) had three M14 parts contracts totalling about $881,000.00 from October 1965 until about February 1971. One of the contracts was for gas cylinders in 1967.

TRW made eleven major parts during its M14 rifle production, which equaled 65 % of the rifle's value. The company's management purposefully produced what it thought could be made economically well. TRW did produce replacement gas cylinders until at least August 1967 and bolts as late as March 1970. The gas cylinders were packaged in cardboard tubes. The cardboard box containing five cardboard tubes of gas cylinders indicated TRW as the USGI contractor but the individual cardboard tubes did not list TRW as the manufacturer.

M14 bolts stamped 7790186 TRW ZJ and wrapped in packaging dated July or October 1969 or March 1970 reveals that TRW kept and used some of the M14 project machinery for some time after the M14 NM rifle contract was fulfilled. Between October 1965 until about February 1971, TRW had M14 parts contracts totaling approximately $2,144,000.00. One contract was to make bolts with the roller assembled and the other for gas cylinders. At $1,927,000, the 1968 contact to make bolts was the second largest known M14 parts contract awarded from July 01, 1965 until the present day. Some or all of the M14 replacement parts made under contract by TRW, Inc. may have been through its TRW Replacement Parts Division (CAGE Code 66614). The U. S. government budgeted $4,000 to lay away twenty-one M14 project production machines at TRW ($2,000 in Fiscal Year 69, $1,000 in Fiscal Year 70 and $1,000 in Fiscal Year 73). Twenty of the twenty-one production machines were to be laid up by the end of June 1970. The last M14 production machine at TRW was scheduled for lay up in February 1973. Based on the contracts awarded, these machine tools were likely use for making M14 bolts.

Harrington & Richardson subcontracted parts production to a large extent for its rifle contracts. Parts marked with HR followed by a third letter, e.g., HRT, were manufactured by subcontractors to Harrington & Richardson. Harrington & Richardson went on to produce a substantial selection of M14 replacement parts under twelve U. S. government contracts totalling approximately $1,600,000.00 between October 1965 and about

December 1971. Harrington & Richardson, Inc. produced gas cylinder locks and bolt locks in 1966 and gas pistons, selector switches and connector assemblies in 1967.

Frazier Manufacturing Company produced elevation knob and pinion assemblies in 1962 as replacement parts and Wico Electric Company did likewise in 1969. Bruce Machine & Engineering produced gas pistons in 1966. Spec Tool Co. manufactured operating rod spring guides in 1967. The same year, Structurlite Plastics Corporation made solid fiberglass hand guards and Precision Products, Inc. produced ejector assemblies. The M2 bipod was made by Farmer Tool & Supply Co. as late as 1968. Mechanical Components Corporation made gas cylinders in 1969 and Benrus Watch Company manufactured firing pins the same year. Dennison Machine Tool Co., Inc. made hammers about 1969 to 1970. Hesse Machine & Mfg. Co. manufactured flash suppressors in 1970. The Brookfield Precision Tool parts were made from 1988 to 1996.

Watervliet Arsenal - Watervliet Arsenal (Watervliet, NY) was established in 1813. It is famous as the cannon and artillery factory for the U. S. Army and U. S. Navy. However, Watervliet Arsenal did play a part in the production of the M14 rifle. In February 1961, the Arsenal was awarded $330,906.00 by Springfield Armory to manufacture M14 parts. This work mostly consisted of pilot line production of bolts and cartridge clip guides for Harrington & Richardson. Mr. S. J. Soltys, of Troy, NY, was the head of the minor components section. The minor components section made the M14 parts for the Arsenal in 1961.

Watervliet Arsenal also modified about 200 M14 bolts in its tool room shortly after Operation Desert Storm. The bolts were machined for a precision lug rear-to-face dimension. A special machine tool fixture was provided to the tool room along with the lot of bolts for the job. Less than fifty of the bolts were found to have sufficient material to meet the dimensional requirements for this unusual order. The source that provided the tool fixture is unknown as well as where it went to or if there were any further plans for its use.

Genuine USGI stampings are 1/16 " tall on the bolt and trigger housing. Note that not all USGI M14 parts were made by forging or extrusion. Some were made by investment casting, e.g., flash suppressors, winter trigger safeties, selector switches, sear releases and M14E2 muzzle stabilizers. Sometimes a casting can be identified by a raised line on the surface of the part where the halves of the mold were fitted together.

A July 1966 report by Springfield Armory reported on Department of the Army Project number 45-4-73102-01-45-M6. The project was an investigation into the serviceability of eleven SPIW parts made by investment casting. The report concluded that investment cast parts were suitable for the SPIW with improved service life for some of the parts. As an example, the service life of the SPIW hammer made by investment casting was twice that of a hammer machined from bar stock even though both parts were heat-treated to the same hardness. IBM brand M1918A2 Browning Automatic Rifle receivers were made by investment casting in the 1940s. The largest firearms manufacturer in the United States, Sturm, Ruger, & Co., Inc. has enjoyed tremendous commercial success with its rifle, shot gun, pistol and revolver receivers, frames, slides, bolts and other parts made from investment castings. The chief advantage of investment casting to produce rifle parts is cost savings from reduced machine tool run time. If sound castings meeting the required element compositions are used and heat treatment procedure is strictly followed, investment cast parts are satisfactory for use in rifles.

FSCM and CAGE – From late in World War II until late 1974, contractors doing business with the U. S. government were identified by a five digit number known as the Federal Supply Code for Manufacturers (FSCM). The FCSM system eventually ran out of five digit numbers. So, as of October 25, 1974 all new contractors are identified by a five alphanumeric character code known as a Contractor and Government Entity (CAGE) code. The CAGE system includes the old FCSM numbers as well. For example, 0LB99 was a part made by McMillan Fiberglass Stocks. Consequently, any part made by a business assigned an alphanumeric CAGE Code could not have been produced before October 25, 1974.

FSN, NSN, SNL and FSC - The four character code starting with "A", "B", "J", etc. found at the end of a part Federal Stock Number (FSN) was part of the Standard Nomenclature System (SNL) in use by the U. S. Army for ordnance items since the late 1920s. The SNL system code identified the system the part was associated with. The first character, a letter, identified the group of systems. The letter A stood for automatic weapons. The letter B group included small arms and pyrotechnic launchers. The letter J was assigned to systems for tools. The numbers were sequentially assigned to each system within a group. For example, B21 was the M1 Rifle and B53 was the M14 (and T44E4) rifle system. The system codes sometimes had zeroes in the format but the meaning was the same, i.e., B53 was the same as B053. Items that were carried over to new systems, i.e., M1 rear sight aperture, kept the original SNL system code. That is why sometimes the B21 code is used on the packaging of M14 parts. The SNL system codes were to be discontinued with the adoption of the Federal Stock Number system. However, the SNL codes were used until about 1970.

To standardize identification of parts, vehicles, fuels, lubricants, clothing and everything else the U. S. Armed Forces needed, the Federal Stock Number system was adopted on January 01, 1954. U. S. Army ordnance items were adopted into the FSN system. The FSN number was an eleven digit numbering format. The M14 gas cylinder had a FSN of 1005-790-8766. The first four digits of the FSN (and later National Stock Number) was the Federal Supply Code or FSC. The FSC was an item group number. For example, 1005 was assigned to items belonging to small arms up to and including 30 mm diameter bore. The FSC 9150 was assigned to lubricants and so forth.

By the early 1970s, the number of items in the Federal Stock system had grown so large that it was apparent the eleven digit format would not have enough numbers to provide a unique number for each item. Consequently, the National Stock Number (NSN) system was implemented. For existing FSNs, the conversion to NSN was relatively simple by adding two digits immediately after the FSC. Hence, the gas cylinder FSN of 1005-790-8766 became the NSN 1005-00-790-8766. The two digit code is known as the National Codification Bureau. The two digit code identifies the nation that assigned the NSN and maintains the item. The USA is assigned the two digit codes 00 and 01. As more items were added to the supply system the numerals 01 were placed after the FSC to continue the practice of assigning a unique stock number for every supply item. The NSN system is used by NATO member and other allied countries. M14 items such as pins and screws were reclassified into other Federal Supply Codes. As an example, the late version trigger pin had a FSN of 1005-819-4501 but was given a NSN of 5315-00-819-4501.

By 2004, the U. S. military supply system had a shortage of spare M14 parts. On May 04, 2004, a solicitation for M14 parts was posted on the Internet by Rock Island Arsenal. This request for parts included 1,400 hammer spring plungers, 100 operating rods, 150 gas pistons, 750 ejector assemblies and 150 flash suppressors. From 2004 to 2008, Rock Island Arsenal awarded contracts and issued purchase orders for M14 parts:

December 29, 2004 - 400 gas pistons (Advanced CNC Manufacturing, Inc.)
March 28, 2005 – 400 ejectors and ejector springs (Anco Machine Co.)
May 23, 2005 – 700 front sights (Tri-Technologies, Inc.)
June 08, 2005 – 900 flash suppressors (Airtronic Services, Inc.)
June 28, 2005 – 450 operating rods (Tri-Technologies, Inc.)
July 18, 2005 – 400 safeties (Sigma Manufacturing Industries, Inc.)
August 12, 2005 – 350 trigger and sear assemblies (Tri-Technologies, Inc.)
September 19, 2005 - indefinite quantity contract for twenty round magazines with a guaranteed minimum quantity of 25,000 (Check-Mate Industries, Inc.)
January 30, 2006 - 800 gas pistons (Advanced CNC Manufacturing, Inc.)
March 02, 2006 - 400 hammers (Smith Enterprise, Inc.)
March 07, 2006 -155 operating rod guides (Beta Engineering, Inc.)
September 08, 2006 - 400 safeties (Bells Chapel Machine & Tool)
January 03, 2007- minimum quantity of 2,600 ejector assemblies (Focus Hope Companies, Inc.)
January 29, 2007 - minimum quantity of 400 safeties (Connectec Company, Inc.)
March 12, 2007 - 300 gas pistons (Scott Products, Inc.)
March 29, 2007 - 300 operating rod guides (Swaim Machine Co., Inc.)
April 17, 2007 - 30 M14 EBR stocks with accessories (Sage International, Ltd.)
May 02, 2007 - 400 operating rods (Fine Manufacturing, Inc.)
October 18, 2007 - minimum quantity of 900 front bands (Connectec Company, Inc.)
October 29, 2007 - 500 M14 EBR stocks with accessories (Sage International, Ltd.)
January 28, 2008 - minimum quantity of 350 operating rod guides (Swaim Machine Co., Inc.)

Since late 2001 when hostilities began in Afghanistan, individual servicemen and combat unit supply officers in the U. S. Army have purchased small quantities of accessories, magazines, parts, and optics from the commercial market to better equip and upgrade the M14 rifles in their custody.

The following is a list of known contractors and government facilities that have produced USGI M14 parts. The individual entity is listed first followed by any identifying marks or Commercial and Government Entity (CAGE) Code and what parts the contractor is known to have made.

**Table 27: USGI Contractors for M14 Rifle Items**

| USGI Contractor | Identifying Marks or CAGE Code | M14 Parts or Accessories Made |
|---|---|---|
| A-1 Sewing Contractors, Inc. (St. Louis, MO) | 0NZ21 | M1967 nylon dual magazine pouch for the M14 |
| Adkins Wood Products Corp. (Ozone Park, NY) | | two button fabric envelope |
| Advanced CNC Manufacturing, Inc. (Largo, FL) | 1YDC9 | gas piston |
| Aerial Cutlery (Marinette, WI) | Aerial | M6 bayonet |
| Airtronic Services Inc. Medical/ Aviation Division (Elk Grove Village, IL) | 1C5Q6 | flash suppressor |
| Allied Precision Products, Inc. (Dunedin, FL) | 24249 | NM windage knob |
| Anco Machine Co. (Hunstville, AL) | 3V055 | ejector and ejector spring |
| Anniston Army Depot (Anniston, AL) | AAD | walnut M14E2 stock |

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|---|---|---|
| Apex Metal Stamping Co., Inc. (Brooklyn, NY) | A, APEX | M14E2 stock fore grip mount, M14E2 stock butt plate bracket, gas piston, cartridge clip |
| Argo Development Corporation (Inwood, NY) | ARGODEVCORP, 17808 | M14E2 stock rubber butt pad |
| Associated Spring, Inc. (Bristol, CT) | AO | cartridge clip |
| Associated Spring, Inc. - Barnes-Gibson-Raymond Division (Plymouth, MI) | BGR | cartridge clip |
| Atwood Vacuum Machine Co. (Rockford, IL) | AV, 70523 | magazine |
| Badger Ordnance (North Kansas City, MO) | 0WXH8 | M14 DMR and M39 EMR scope rings |
| Barlow Metal Stamping, Inc. (Bristol, CT) | 9M944 | NM wood stock ferrule |
| Bearse Manufacturing Co. | | M15 grenade launcher sight carrying case |
| Benrus Watch Co. (Waterbury, CT) | | third version firing pin |
| Beta Engineering, Inc. (Arlington, TX) | 33436 | operating rod guide |
| Bells Chapel Machine & Tool (Atkins, AR) | 3BDS2 | safety |
| BHM Corporation (Monagup Valley, NY) | BHM CORP, 29763 | gas cylinder plug wrench |
| Bishop | possibly B | standard contour M14 stock |
| Borg-Warner (Rockford, IL) | BW, BRW, BRW S-1, BRW B-2 | magazine |

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|---|---|---|
| Bray Oil Company (Los Angeles, CA) | | general purpose lubricating oil, LSA oil |
| Brookfield Precision Tool (Brookfield, MA) | BKFLD PREC TL, 0DF66 | operating rod spring guide, scope mount, gas piston, scope mount adapter for AN/PVS-4, Navy special flash suppressor, sound suppressor |
| Bruce Machine and Engineering (Peabody, MA) | BME, 02481 | windage knob, NM windage knob |
| Bruce Machine and Engineering (Dearborn, MI) | | gas piston |
| Brunswick Sports Products Co. (Torrington, CT) | 14530 | magazine |
| Canadian Arsenals, Ltd. (Long Branch, ON) | CA, C A L | standard contour NM barrel, birch M14E2 stock |
| Carleton Mfg. Co. (Carleton, MI) | | cleaning kit rod section case |
| Cathey Enterprises, Inc. (Brownwood, TX) | 8K916 | M1907 leather sling |
| Chase Bag Co. | | M2 bandoleer (observed dates September 1967 to November 1969) |
| Check-Mate Industries, Inc. (Wyandanch, NY) | C.M.I., 1M291 | ten round and twenty round magazine |
| Clifton Automatic Screw Machine Co. (Erie, PA) | | gas cylinder plug |
| Clipper International Corp. (Detroit, MI) | | M14E2 stock modification kit |
| Columbus Milpar and Manufacturing Co. (Columbus, OH) | MILPAR COL, 16689 | complete M6 bayonet, M6 bayonet left side grip |

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|---|---|---|
| Comerford Mfg. Co. (Anaheim, CA) | COM | late version magazine filler |
| Conetta Mfg. Co. (Stamford, CT) | | trigger and sear assembly |
| Continental Air Supply Co. (Fort Worth, TX) | | M8A1 scabbard restraining lace |
| Continental Fabricators Corp. (Brooklyn, NY) | | operating rod spring guide |
| Cooper Precision Manufacturing (Oak Ridge, TN) | 1JHX1 | DMR barrel |
| Connetec Company, Inc. (Irvine, CA) | 0EFR2 | safety |
| Craft Metal Corp. (Warren, MI) | | gas cylinder (prime contractor) |
| Crawford Development & Mfg. Co. (Tucson, AZ) | | cleaning rod section |
| Curtis Industries, Inc. (Southfield, MI) | | M14 combination tool |
| Defense Procurement Manufacturing Services, Inc. (Saint Cloud, MN) | 40554 | trigger housing |
| Del Jet Engineering and Mfg. Corp. (City of Industry, CA) | | M1/M14 bolt disassembly and assembly tool |
| Del-Con Supply Co. (Fort Worth, TX) | | M14 wood stock upper butt screw |

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|---|---|---|
| Delta-X Corporation (Morrisville, PA) | 33950 | NM/2A rear sight base |
| Dennison Machine Tool Co., Inc. (Hickory, NC) | DM, 96567 | hammer |
| Do Well Mfg. Co., Inc. | 27471 | M14E2 stock fore grip |
| Douglas Barrels, Inc. (Charleston, WV) | 0K789 | NM barrel |
| Druge Brothers Manufacturing Co. (Oakland, CA) | DRC, 72757 | windage knob, elevation knob |
| E C T Corporation (Fayetteville, NC and Kinston, NC) | ECT CORP, 26946 | M1967 nylon magazine pouch for the M14 |
| East Moline Metal Products (East Moline, IL) | EMMPCO | blank firing attachment, breech shield |
| Eastern Canvas Products (Corozal, PR) | | M1956 magazine web pouch |
| Eastern Canvas Products (Haverhill, MA) | 08501 | M1961 magazine web pouch |
| Eltra Corporation (West Springfield, MA) | | elevation knob and pinion assembly |
| Enrex Corporation (Sterling Heights, MI) | ENREX, 0BTD4 | NM windage knob |
| Ever Tite Manufacturing Co. | | front sight |

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|---|---|---|
| Farmer Supply & Tool Mfg. Corp. (Denver, CO) | | M2 bipod marked 7790688 |
| Fine Manufacturing, Inc. (Lodi, NJ) | 0SAR6 | operating rod |
| Focus Hope Companies, Inc. (Detroit, MI) | 00P13 | ejector and ejector spring |
| Ford Radio & Mica Corp. (Brooklyn, NY) | R.F.M. | late version magazine filler |
| Frazier Manufacturing Co. | FZR | elevation knob, windage knob |
| Freehold Manufacturing Assembly Co., Inc. (Little Silver, NJ) | 2S308 | connector lock pin |
| G. G. Green Enterprises, Inc. (West Warren, PA) | G.G.M. | cartridge clip |
| G. G. Greene Metal Stamping Co. (West Warren, PA) | G.G.G., G.G. GREENE, 26194 | cartridge clip, late version magazine filler |
| General Automatic Corp. (Oakland, CA) | | bolt roller |
| General Cutlery, Inc. (Fremont, OH) | 20014 | M10 scabbard |
| General Tire & Rubber Co. (Marion, IN) | 89341 | M14 fiberglass reinforced plastic stock |
| George Senn, Inc. (Philadelphia, PA) | | rifle bore cleaner |

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|---|---|---|
| Globe Union, Inc. Ignition Division (West Springfield, MA) | | rear sight elevation knob and spindle |
| Gramercy Machine Corp. (Freeport, NY) | | M5 winter trigger |
| Greene Metal Products, Inc. (then Harrison Township, MI) | 0LKH0 later 4M107 | bore straightness plug gage |
| Guenther Mfg. Co., Inc. (Buchanan, NY) | | trigger guard |
| Harrington & Richardson (Rochdale and Worcester, MA) | H, H R, H&R, HRA, H&R Arms Co., H&R D | bolt lock, chromium plated barrel, extractor spring assembly, flash suppressor, flash suppressor nut, front band, gas cylinder, gas cylinder lock, gas cylinder plug, gas piston, hammer, operating rod, receiver, rear sight base, safety, selector switch, trigger and sear assembly, trigger guard assembly, trigger housing, M14 wood stock chamber brush |
| Harris Engineering, Inc. (Barlow, KY) | 57215 | M14 DMR, M39 EMR and Mk 14 bipods |
| Hart Rifle Barrels, Inc. (Lafayette, NY) | 0FMZ6 | NM barrel |
| Hauser Products, Inc. (Chicago, IL) | 1Z803 | M10 scabbard |
| Heckethorn Mfg. Co. (Dyersburg, TN) | | M1961 magazine web pouch |

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|---|---|---|
| Hertzberg & Son, Inc. (Middletown, NY) | | M14 chamber brush |
| Hesse Machine & Mfg. Co., Inc. (Boston, MA) | H, 21935 | blank firing attachment, flash suppressor, magazine latch |
| Holiday Mfg. Co. (likely Grand Island, NE) | | lubricant case |
| Imperial Knife Company (Providence, RI) | Imperial, 74846 | M6 bayonet, M10 scabbard |
| Industrial Home For The Blind (Brooklyn, NY) | 83268 | soft nylon weave small arms sling |
| J P Manufacturing | | late version magazine filler |
| James Ippolito & Company (Bridgeport, CT) | 96458 | NM rear sight base |
| Kanvas King, Inc. (Los Angeles, CA) | | M1961 magazine web pouch |
| Killeen Machine & Tool (Worcester, MA) | KMT CO., K8, 92983 | magazine (ten and twenty round), operating rod spring guide, safety, late style trigger guard, standard M14 stock butt plate flapper |
| Kingspoint Manufacturing Co., Inc. (Fayetteville, NC) | | M2 bandoleer, M1967 nylon dual magazine pouch for the M14, M1907 sling |
| Kisatchie Machine Works (Forest Hill, LA) | 1TE83 | M39 EMR bipod lock |
| Krieger Barrels, Inc. (Richfield, WI) | 0DCS1 | DMR and NM barrels |

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| LPR Precision Parts & Tools Co. (Farmingdale, NY) | LPR | NM windage knob |
| La Crosse Garment Mfg. Co., Inc. (Mauston, WI) | | M1956 magazine web pouch |
| Lady Mac Corset Co., Inc. (Buffalo, NY) | 18331 | M14A1 cleaning kit pouch |
| Lexington Industries, Inc. (Port Sanilac, MI) | | M151 vehicle mounting kit for M14 and M16 rifles |
| Lufkin Industries (Lufkin, TX) | stylized Lufkin | cartridge clip, elevation knob, windage knob |
| Lundquist Tool and Mfg. Co. (Worcester, MA) | 74010 | early version operating rod spring guide |
| L W Schneider, Inc. (Princeton, IL) | 50481 | M14 NM sling swivel assembly (part number 9352716) |
| Mathewson Tool Co. (New Haven and later Orange, CT) | 26097 | early (T44E4 design) walnut stock, magazine, M14E2 stock butt plate bracket, M14E2 stock rubber butt pad, M14E2 muzzle stabilizer modification kit |
| McMillan Fiberglass Stocks, Inc. (Phoenix, AZ) | 0LB99 | DMR and NM stocks |
| Mechanical Components Corporation (Glendale, CA) | 27454 | gas cylinder |
| Mercury Tool & Machine (Aston, PA) | 24411 | operating rod |
| Metal Craft Co. (Detroit, MI) | | M151 vehicle mounting kit for M14 rifle |

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| Metal Industries, Inc. (Amarillo, TX) | | broken shell extractor |
| Mill-Rose Company (Mentor, OH) | | bore brush |
| Minnesota Aerospace Corp. (Anoka, MN) | | M1961 individual equipment belt |
| New Haven Clock and Watch Co. (New Haven, CT) | NHC, 76728 | elevation knob and spindle |
| Nomura Machine (Stockton, CA) | NOA, 0NWF5 | NM heavyweight barrel assembly, NM medium weight barrel |
| Novelty Products Co. (New York, NY) | NOV PROD CO, NOV PROD | M2 bandoleer (observed dates of July 1966 to April 1969) |
| O K Tool & Die Co. (Williamstown, NJ) | | bore reflector |
| Olin Mathieson Chemical Corporation (New Haven, CT) | OM, W-W, Winchester, 66118 | bolt, chromium plated barrel, flash suppressor, gas cylinder, hammer, M14 wood stock, magazine, operating rod, receiver, safety, rear sight aperture, rear sight base, trigger and sear assembly, sear release, trigger housing, ammunition |
| Ontario Knife Co. (Franklinville, NY) | 2V376 | M10 scabbard |
| P. T. E. Inc. (then Hicksville, NY) | 26546 | NM 0.0520 " hooded aperture assembly |
| Peninsular Chemical Products Co. (Detroit, MI) | | spindle valve |
| Pennsylvania Working Home for the Blind (Philadelphia, PA) | PWH, TWB, 86465 | M8A1 scabbard |

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| Precision Products, Inc. (Chicopee, MA) | | ejector assembly, hammer spring housing |
| Prospect Mfg. & Engineering Co. (Taylor Center, MI) | | M14 combination tool |
| R. M. Hollingshead Corporation (Hanover, NJ) | | general purpose lubricating oil |
| Reinhart Fajen, Inc. or R F Acquisition, Inc. (Warsaw, MO) | 77742, 3T616 | NM stock |
| Rochester Manufacturing Co. | HR-R, R | magazine |
| Rock Island Arsenal (Rock Island, IL) | 19204 | walnut M14E2 stock, operating rod, M10 scabbard |
| Romark Industries, Inc. Military Systems Division | 25507 | NM windage knob |
| Saco-Lowell later Maremont Corporation (Saco, ME) | SAK, 26978 | chromium plated barrel, standard, medium and heavy contour NM barrel, third version firing pin, gas cylinder, gas piston, and operating rod |
| Sage International, Ltd. (Oscoda, MI) | 0Y503, 1NUY9 | M14 EBR, M39 EMR and Mk 14 stock and accessories |
| Scott Products, Inc. (New Baltimore, MI) | 2W003 | gas piston |
| Screwtech, Inc. | | flash suppressor nut setscrew |
| Seaboard Mfg Laboratories, Inc. (Philadelphia, PA) | | rifle bore cleaner |
| Seymour Products Co. (Seymour, CT) | SEY, SEMCO, 86951 | cartridge clip, early and late version magazine filler, M2 bandoleer |

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| SGW (Olympia, WA) | SGW, 4S779 | NM barrel |
| Sheffield Corp. | | M14 fiberglass reinforced plastic stock |
| Singer Hosiery Mills, Inc. (Thomasville, NC) | | M1961 magazine web pouch |
| Sloane M Mfg. Co. (New Prague, MN) | | hard nylon weave small arms sling |
| Smith Enterprise, Inc. (Tempe, AZ) | SEI, 3A5E1 | connector lock, extended bolt lock, flash hider, gas cylinder lock, gas cylinder lock front sight, hammer, hammer pin, muzzle brake, NM rear sight base, NM and standard front sight, operating rod, operating rod spring guide, scope mounts, sound suppressors, stock rails, trigger pin and 30 mm scope rings |
| Southwest Grease & Oil Co., Inc. (Kansas City, MO) | | semi-fluid lubricant |
| Spec Tool Co. (Pico Rivera, CA) | | operating rod guide |
| Spiral Tool Co. (then Woodside, NY) | 02108 | M14A1 butt plate assembly |
| Springfield Armory (Springfield, MA) | S A, Springfield Armory, 19205 | all rifle parts and all magazine parts |
| SPS Co. | | bolt lock pin |
| Stanley-Humason, Inc. | | front band, safety spring |
| Sterling Tool & Mfg. Co. (Chicopee Falls, MA) | | magazine latch |
| Stewart Iron Works (Covington, KY) | SWK, 82664 | windage knob |

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| Structurlite Plastics Corp. (Hebron, OH) | | solid fiberglass hand guard assembly |
| Sunshine Makers, Inc. (Huntington Beach, CA) | 1Z575 | cleaning compound for the Mk 14 Mod 0 |
| Swaim Machine Co., Inc. (Scottsboro, AL) | 8T985 | operating rod guide |
| Sykes Manufacturing | Half-lozenge with S underneath | M14, M14 NM (drawing D7791174) and M14E2 birch stocks |
| Textile Machine Works | HRT | bolt |
| TRW, Inc. (Cleveland, OH) | TRW | bolt, connector, flash suppressor, gas cylinder, gas piston, hammer, magazine, operating rod, rear sight base, receiver, safety, trigger housing, chromium plated barrel, and standard contour NM barrel |
| Tong Industries (Republic of Korea) | 88 T I, 89 T I, 90 T I and T I | safety (numerals indicate year of manufacture), windage knob |
| Tri-Technologies Inc. Thermal and Moisture Protection Division (Mount Vernon, NY) | 06MA8 | front sight, operating rod, trigger and sear assembly |
| Union Hardware Company (Los Angeles, CA) | U H C (in a semi-circle), 78988 | magazine |
| Unknown # 1 - possibly Apex Metal Stamping Co., Inc. (Brooklyn, NY) | $A_1$, A3 | cartridge clip |
| Unknown # 2 | raised letter A | safety |
| Unknown # 3 - possibly J&D Tool Company | AN | M6 bayonet |

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| Unknown # 4 | raised lettering ATW | part number 7790837 M2 bipod left leg shaft assembly |
| Unknown # 5 | raised lettering BKS | part number 7790837 M2 bipod left leg shaft assembly |
| Unknown # 6 - possibly County Machine & Tool | COUNTY MACH | M14E2 stock butt plate base |
| Unknown # 7 | CCP | NM windage knob |
| Unknown # 8 | CTX | magazine follower |
| Unknown # 9 | italicized D | sear release |
| Unknown # 10 | H A, H B | safety |
| Unknown # 11 - subcontractors for Harrington & Richardson | HR C | hammer |
| Unknown # 12 - subcontractor for Harrington & Richardson | HR F | hammer |
| Unknown # 13 – possibly Nichols Machine | HR-N, OM-N | trigger housing |
| Unknown # 14 | LPR | NM windage knob |
| Unknown # 15 | MHRA, MXR | safety |
| Unknown # 16 | N. E. INC. | M14E2 stock rubber butt pad and fore grip |
| Unknown # 17 | raised letter O | safety |
| Unknown # 18 | ROBER HT-B, ROBER HT-D | safety |
| Unknown # 19 | S. T. & D. | M14E2 stock hinged butt plate bracket assembly |
| Unknown # 20 | TOMCO | NM windage knob |
| Unknown # 21 | VIZ/WD, WD | M8A1 scabbard |
| Unknown # 22 | W that is underlined | magazine |

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| Victory Plastics Company (Hudson, MA) | V.P. CO., 96126 | M8A1 scabbard |
| Viz Manufacturing Co. (Philadelphia, PA) | VIZ, 41226 | M8A1 scabbard |
| Watervliet Arsenal (Watervliet, NY) | | bolt, cartridge clip guide |
| Weather Manufacturing Co. | W inside a hexagon with an arrow through the base of the W | windage knob |
| Westinghouse Electric | W | magazine |
| Wico Electric Co. (West Springfield, MA) | WCE | elevation knob, windage knob |
| Worden Specialty & Machine Tool Co. (Plymouth, MI) | 12408 | combination tool |
| Wright Manufacturing Co. | HRA-W, WRIGHT | windage knob |
| Wyandotte Tool Co. (Wyandotte, MI) | | rear sight cover |
| Yankee Hill Machine Company, Inc. (then Northampton, MA) | | front sight and screw, bolt roller retaining ring pliers |

U. S. government financial records did not always identify the specific M14 part or accessory made for a given contract. Nonetheless, the following companies have not been listed above but were definitely involved in making at least one USGI M14 rifle item under contract. All of the companies listed below were awarded contracts valued at more than $10,000.00 for a M14 related item between July 01, 1965 and June 30, 1997 by either the U. S. Army or the U. S. Navy.

Adventure Line Mfg. Co., Inc. - Parsons, KS
Allied Materials & Equipment Co. - Kansas City, MO

Argo Spring Mfg. Co., Inc. - Norwalk, CA
Astron Industries, Inc. - Glastonbury, CT
Basic Manufacturing, Inc. - Butler, WI
Bellmore Johnson Tool Co. - Hamden, CT
Bemis & Call Co. - Springfield, MA
Bristol Dynamics - Brooklyn, NY
Cantellos Tool & Gage - Oglesby, IL
Connecticut Spring Corp. - Farmington, CT
Contract Machining Corp. - Cambridge, MA
Crocket & Kelly, Inc. - Westminster, CO
Cumberland Machinery Inc. - New Kingston, PA
Edson Tool, Inc. - Freeport, NY
Engineering Research, Inc. - Indianapolis, IN
Engineering Research, Inc. - Naples, FL
G Z Products Inc. - Rancho Cordova, CA
Handy Tool & Mfg Co., Inc. - Woodside, NY
Harder Precision Components - Clearwater, FL
Harris Manufacturing Co. - Smyrna, DE
Hawkeye Speciality Co. - Davenport, IA
Herlo Engineering Corp. - Hawthorne, CA
Holiday Manufacturing Co. - Grand Island, NE
Hoppe Tool Works, Inc. - Chicopee Falls, MA
J C Manufacturing, Inc. - Minneapolis, MN
Kan Du Tool & Instrument Corp. - Valley Stream, NY
Kurz Kasch, Inc. - Newcomerstown, OH
Leetronics, Inc. - Brooklyn, NY
Lemco Plastics, Inc. - Milwaukee, WI
Lewis Machine & Tool Co. - Milan, IL
Lincoln Machine Parts Corp. - New York, NY
Lisk G W Co., Inc. - Clifton Springs, NY
Made Rite Tool Co., Inc. - Holyoke, MA
Made Rite Tool Co., Inc. - Springfield, MA
Micron Mfg. Co. - Springfield, MA
Mil Std Corp. - Glen Cove, NY
National Metalcrafters, Inc. - Philadelphia, PA
Newcastle Industries, Inc. - Kentwood, MI
Nichols Engineering, Inc. - Shelton, CT
Northampton Machine Co., Inc. - Northampton, MA
Northeastern Machine & Tool Corp. - Stamford, CT
O'Hare Spring Co., Inc. - Des Plaines, IL
Opto Mechanik, Inc. - Melbourne, FL
Outdoor Sports Industries, Inc. - Denver, CO
P M Engineering Service, Inc. - Van Nuys, CA

Penjaska Tool Co. - Owosso, MI
Precision Founders, Inc. - San Leandro, CA
Precision International Corp. - Tullahoma, TN
Remington Arms Co., Inc. - Ilion, NY
Roselle Precision Products, Inc. - Berkeley Heights, NJ
Roy-Alan Corp. - New York, NY
Sacks H & Sons, Inc. - Brookline, MA
Skyline Industries - Fort Worth, TX
Southwest Grinding & Mfg., Inc. - Euliss, TX
Standard Armament, Inc. - Glendale, CA
Textile Belting & Strapping Co. - Fall River, MA
Tompkins Products - Detroit, MI
Ubique, Ltd. - Brooklyn, NY
United States Industries, Inc. - Grand Island, NE
Vari Ohm Electronics, Inc. - Islip, NY
Wall Mfg. Co. - Freeport, NY
Westchester Tool & Die Corp. - Buchanan, NY

Some M14 and M14E2 parts were marked with the respective USGI part number. For some parts, the part number was consistently applied, e.g., barrels and bolts. For other parts, they were usually not marked with the part number. Most gas cylinders were not stamped with the part number. The exceptions noted are gas cylinders made in 1963 (Saco-Lowell) and 1969 (Mechanical Components Corp.) which were stamped S/N 7790902. Parts observed with part numbers are listed as follows:

**Table 28: USGI M14 Rifle Items with Part Number Markings**

| USGI Part | Part Number |
|---|---|
| barrel, chromium plated | 7790190 |
| barrel, National Match, standard contour | 7791362 |
| barrel, National Match, medium weight contour | 9345206 |
| barrel, National Match, heavyweight contour | 9349847 |
| bolt subassembly without the roller | 7790185 |
| bolt subassembly with the roller | 7790186 |
| gas cylinder | 7790902 |
| hammer | 5546008 |
| lubricant case | 7790995 |
| magazine filler (late version) | 7791154 |
| M14 stock hinge inlet protector | 7791050 |

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| M14 stock hinge transition piece | 7790914 |
| M14E2 muzzle stabilizer | 7791661 |
| M14E2 muzzle stabilizer | 11686521 |
| M14E2 stock | 5910438 |
| M14E2 stock butt pad | 7791673 |
| M14E2 shoulder rest plate | 7791683 |
| M14E2 stock hinged butt plate bracket assembly | 7792062 |
| M2 bipod | 7790688 or 7790833 |
| M5 winter trigger | 7790808 |
| M6 bayonet left side grip | 7267653 |
| M6 bayonet right side grip | 7267652 |
| M76 grenade launcher latching handle assembly | 7790900 |
| M84 scope carrying case | 7631596 |
| muzzle protector | 7790232 |
| operating rod | 7267064 |
| operating rod handle protector | 7790231 |
| rear sight base, NM 2/A | 7791571 |
| rear sight protector | 7791358 |
| receiver | 7790189 |
| stock, National Match walnut | 7791174 |
| stock, National Match oversized walnut | 9352638 |
| stock, National Match birch | 11010263 |
| stock subassembly, National Match walnut | 11010282 |
| trigger housing | 7267030 |
| XM21 ART scope carrying case | 11729637 |

**USGI Parts Sales**

USGI parts were sold to the American public after termination of M14 rifle production in 1964. Harrington & Richardson, TRW and Winchester all sold off their M14 parts inventory to the commercial market. This was done in an attempt to recoup some of their investment in the M14 program. Additionally, in the 1960s the U. S. Army declared much of its M14 parts inventory surplus and released them to the public for sale. Mr. Elmer Ballance of Devine, Texas purchased the parts inventory from companies who manufactured the M14 and from foreign nations that had received M14 rifles and parts under U. S. military assistance programs. From these parts stocks, his business began production of the M1A rifle in 1971.

In the early 1970s, surplus small arms parts dealers such as Thomas A. Buss (then of Springdale, PA), Gerald Drasen (1993 address Nesard P. O. Box 56 Lake Zurich, IL 60047) and William J. Ricca (PA) bought and sold USGI M14 parts from government auction sales and on the open market. In 1970 and 1971, a fair number of individuals, small gun shops and large parts and accessories houses sold surplus USGI M14 parts and accessories to the civilian market. AR Sales Co. bought M14 parts directly from the contractors about the same time or earlier. Bob Penney, associated with Federal Ordnance, Inc. in the early 1970s, was also buying surplus M14 parts. In 1973, USGI M14 bolts and operating rods could be had at gun shows in San Jose, CA for $5.00 each and USGI M14 barrels for $10.00 to $15.00 each. In the 1970s and 1980s, surplus parts dealers William J. Ricca, Thomas A. Buss, Fred Hochrein (PA), Bill Plantamura (M14 Research Service), Jay Higgins (The Amherst Depot), and Bruce Dow (then of East Oakmont, PA) bought and traded USGI M14 parts at gun shows in Pennsylvania and Ohio.

**Table 29: Retail Suppliers of USGI M14 Related Items - 1970 and 1971**

| Supplier | Mailing Address City and State |
|---|---|
| Al's Corral | Atlanta, GA |
| Arasco | South El Monte, CA |
| Arizona Ordnance Co. | Phoenix, AZ |
| Armament Advisors | Phoenix, AZ |
| B. H. Service | Pandora, TX |
| Baron's | Oak Park, MI |
| Bill Edwards | Atlanta, GA |
| Ed Agramonte | Yonkers, NY |
| G.F.A. Sales Co. | Plumsteadville, PA |

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| George R. Green & Sons | Willoughby, OH |
| Greeley Arms Co., Inc. | Fairfield, NJ |
| Jerry's Guns & Ammo | Hibbing, MN |
| Karl Keely | |
| LJZ Surplus | Belton, TX |
| M. C. Matthews | Snellville, GA |
| Morris Lawing | Charlotte, NC |
| Ozzie's Gun Parts | Mineral, IL |
| P. Michaels | Batavia, IL |
| Pat's Gun Shop | Columbia, SC |
| R. Weatherwax | Chicago, IL |
| Ray A. McKnight | Texarkana, TX |
| Rydberg | Mountain View, CA |
| Sarco | Stirling, NJ |
| Sherwood Distributors | Beverly Hills, CA |
| The Musket Shop | Dumfries, VA |
| Thomas A. Buss | Springdale, PA |
| Tom Forrest | San Diego, CA |

About 1985, Jack Friese, owner of Armscorp of America, Inc., imported approximately 2000 M14 parts kits from Israel.  Before these parts kits arrived in the United States, they made their way through the United Kingdom.  Gerald Drasen purchased the bulk of these parts kits.  Some of these M14 parts kits were sold by Bill Ricca on a consignment basis.

Some of these parts kits were used to assemble H&R Gun Co. semi-automatic M14 rifles. At about the same time, a batch of 1,200 M14E2 stock fore grips and 30,000 M14 gas cylinder plugs were released by Naval Surface Warfare Center (Crane, IN) and purchased and divided among three parts dealers. Armscorp of America, Inc. purchased M14 parts and other items from Karl Maunz from December 1985 until August 1987. Several times in the 1980s, Bob Reese also brought large shipments of M14 parts into the United States. Some other companies also imported M14 parts from Israel during the 1990s. M14 bolts, barrels and operating rods imported from Israel will have Hebrew markings. These Hebrew letter markings are typically found on the top side of the bolt, on the top of the barrel chamber and adjacent to the USGI markings on the operating rod. Through the years, NSWC Crane and Rock Island Arsenal have released various USGI M14 parts for public sale. Many of these parts were sold as a result of destroying M14 rifles. Some of the operating rods from demilitarized M14 rifles were broken in the process, sold as scrap, welded back together and sold in the surplus parts market.

The Office of the Director of the Civilian Marksmanship Program (ODCMP) received and sold USGI M14 parts in the 1990s. ODCMP received its last shipment of USGI M14 parts in 1996 as part of its normal routine operations. These parts were sold to members of DCM affiliated shooting clubs in the United States until supplies were exhausted at the end of 2003. The sales ended because the ODCMP sold what M14 parts they had, according to Orest Michaels, Chief Operating Officer. In February 2004, he did not know when or if the ODCMP would be able to sell any M14 parts in the future. USGI M14 parts remain available for sale from various gunsmiths and parts houses, but in very limited quantities and at increasingly higher prices. Beginning in early 2004, USGI contract barrels, bolts, gas cylinders, operating rods, and flash suppressors are not widely available in the commercial market.

**Parts Interchangeability with the M1 Garand Rifle**

The following parts are interchangeable between the M1 Garand and the M14 type rifle: butt swivel, lower butt plate screw, rear sight aperture, elevation knob and pinion (note that the M14 elevation knob is calibrated in meters, while the M1 Garand elevation knob is calibrated in yards), rear sight base, sight cover, trigger (although the sear requires slight modification of the M14 sear for use in the M1 Garand rifle), hammer, hammer spring, hammer spring plunger, hammer spring housing, safety, hammer pin, trigger pin, extractor, extractor spring, extractor spring plunger, hand guard band (as long as it has not been deformed during removal from the M14 rifle hand guard or the M1 Garand rifle rear hand guard), and butt plates on certain M14 stocks.

A M1 Garand rifle ejector will fit inside a M14 bolt if mated to a M14 ejector spring. However, it is best to use the M14 ejector. The M1 ejector has a single beveled surface on its forward end. The ejector for the M14 was improved by creating two beveled surfaces on the forward end. This minor change resulted in a much more consistent ejection path for spent cartridge cases.

Hammers marked with part numbers C46008, C5546008 and D5546008 are often found in the firing mechanisms of commercial M14 type rifles. These markings indicate World War II, early 1950s and mid-to-late 1950s production M1 Rifle hammers, respectively. The letter prefix of the part number indicated the actual physical size of the part drawing.

The M1 Garand rifle hammer spring plunger *may* cause a problem with the M1A rifle. The design for the USGI M1 rifle hammer spring plunger, B6008880, was originally drawn on August 02, 1937. In 1978, Springfield Armory, Inc. assembled M1A firing mechanisms with modified M1 Garand rifle hammer spring plungers. The head portion of the M1 Garand rifle hammer spring plunger was originally designed with "wings" or "ears" akin to the M1 receiver rear sight pocket. The hammer spring plungers were modified by grinding down the left side "wings" before assembling into the M1A firing mechanisms. By not grinding the "wings" of the hammer spring plunger, the hammer spring plunger *may* move out of the hammer notch which could cause the hammer to move. The USGI drawing B6008880 was revised, likely in 1958, to remove the "wings" from the head portion of the hammer spring plunger. Nonetheless, both types of hammer spring plungers are acceptable for USGI M14 rifle overhauls per U. S. Army DMWR 9-1005-223. The M1 hammer spring plunger is often used in match grade M14 type rifles.

The following operator level items are interchangeable: web sling, cleaning rod section carry case, cleaning rod sections, cleaning rod patch tip, short oiler bottle, plastic spacer for bore brush and patch tip, 7.62 mm chamber brush for 7.62 mm M1 Garands only, .30 Caliber bore brush (although the drawing during the 1960s shortened the brush slightly to prevent it from hitting the inside of the butt plate), and either Plastilube or Lubriplate grease was authorized for use on both rifles. The bolt assembly and disassembly tool can be used with either rifle bolt.

**M1 Garand Parts on M14 Type Rifles**

As part of the Marshall Plan after World War II, Italy was given Winchester's M1 machine tools and dies for producing M1 rifles and M1 parts for our European allies which had adopted the M1 Garand. Beretta was given the machinery for making the M1 Garand but two other Italian companies made M1 rifle parts as well. Italian parts quality is as good as USGI M1 Garand parts quality.

Springfield Armory, Inc., Reese Surplus, AIM Surplus and a few other American and Canadian companies have imported many M1 parts kits from Italy. Springfield Armory, Inc. has used some of these Italian parts in its assembly of M1A rifles. Except for very small parts the Italians marked M1 Garand rifle parts with one of three markings: 1) PB for Pietro Beretta 2) BMR for Breda Meccanica Romana Italia and 3) BMB for Breda Meccanica Bresciana. Inexplicably, Pietro Beretta marked BM59 rear sight knobs were observed on two USGI M14 receivers destroyed by the U. S. government in the 1990s. The destroyed M14 receivers were obtained through U. S. government surplus auction.

**USGI Parts Packaging**

The USGI contractor who manufactured the part may be identified on the packaging, e.g., Winchester and Harrington & Richardson flash suppressors, Springfield Armory and Harrington & Richardson gas cylinders and Winchester trigger and sear assemblies. More often than not, the contractor is not identified on the packaging. M14 parts made by Springfield Armory or subcontracted out will usually have the marking Springfield Armory on the package label. M14 parts made by contracts let by the U. S. Army Material Command, Weapons Command or the Defense Supply Agency usually do not identify the contractor on the package label.

Genuine USGI parts were always identified with a Federal Stock Number or a National Stock Number on the packaging. The change from Federal Stock Numbers to National Stock Numbers occurred between 1971 and 1975. Bar codes did not appear on USGI parts packaging until the 1980s. The term REPACK was not used on genuine USGI parts packaging. The Defense Supply Agency was named as such from October 01, 1961 until January 01, 1977. From 1977 to the present, it has been known as the Defense Logistics Agency.

Shell Development Company (San Francisco, CA) and Daubert Chemical Company (then Oak Brook, IL) held at least one patent in the 1960s for the volatile corrosion inhibitor used in the wrapping paper for USGI M14 parts, magazines and accessories. Champion Packages Company (Columbus, GA), Chase Bag Company, Continental Can Co., Inc. (Flexible Packaging Division), Crawford Paper & Plastic, Inc., EDCO (Brooklyn, NY), H P Smith Paper Co., Lawrence Packaging Supply Corp. (Newark, NJ), Ludlow Corporation Packaging Division (Holyoke, MA), Orchard Paper Company (St. Louis, MO), Plastic Film Corporation, RAP Industries (Columbus, GA), Richmond Corporation, and Seal Bag (Rochester, NY) were among dozens of USGI contractors in the 1960s and 1970s that produced chemical vapor paper for the packaging of USGI M14 parts, magazines and accessories. Additionally, Ludlow Corporation produced a private label wrapping paper marked Marvellum. Ludlow manufactured many types of packaging paper for the U. S. military from as early as 1946 until at least 1981. Daubert Chemical Company and EDCO are still in business. RAP Industries and Seal Bag are no longer in business.

If the packaging was not torn or opened, the part was safe from corrosion for five to twenty-five years. The U. S. government over the years released sizeable quantities of chemical vapor barrier paper used to package USGI M14 parts. This paper has been used to package commercial reproduction M14 rifle items which implies the contents were made as part of a U. S. government contract when such is not the case.

Before the early 1980s, USGI M14 parts wrapped in chemically treated paper got coated with volatile corrosion inhibitor, a white powdery substance, over time. This is perfectly normal and the substance can be wiped off. In the early 1980s, packaging technology had advanced so that the volatile corrosion inhibitor was applied to the paper in a thin film of slow drying solvent.  Thus, newer technology volatile corrosion inhibitor treated paper will feel moist when freshly made.

A complete list of Federal Stock Numbers for M14 parts, accessories, tools, maintenance supplies, special equipment and special packaging material can be found in Appendix B of TM 9-1005-223-34.  Some parts such as firing pins, combination tools, and magazines were opened, inspected and repacked by Anniston Army Depot, Crane Naval Surface Warfare Center, Letterkenny Army Depot, Red River Army Depot and other supply depots.  This occurred as early as February 1968.  Used parts such as blank firing attachments and magazines, were cleaned up and rewrapped by the supply depots for reissue as needed.  Spare M14 parts were packaged in the following manner:

**Table 30: USGI M14 Rifle Parts and Accessories Packaging**

| USGI Part or Accessory | Manner of Packaging |
|---|---|
| AN/PVS-2 carrying case | one per transparent heat-sealed plastic bag |
| barrel | one per black cardboard tube |
| barrel cleaning rod patch tip | ten wrapped with vapor barrier paper |
| barrel reflector | twenty per cardboard box |
| bayonet | one per cardboard box inside sealed plastic bag |
| blank firing attachment and breech shield | one pair per cardboard box |
| bolt with roller | individually wrapped with vapor barrier paper or five individually wrapped inside a vapor barrier pack |
| bolt lock | one per heat-sealed pack |
| bolt lock pin | 100 inside cheese cloth wrapper |
| bolt roller | five per heat-sealed pack |
| bolt roller retainer | five per heat-sealed pack |
| bolt roller retaining ring pliers | one inside foil wrap inside sealed clear plastic |
| bore reflector | twenty per cardboard box |
| cartridge clip guide | one per heat-sealed pack |
| chamber brush | ten per cardboard box with each inside a cardboard sleeve |
| cleaning rod section | ten per package |
| combination tool | one per heat-sealed pack or cardboard box or black cardboard tube |

| | |
|---|---|
| connector assembly | one per sealed clear plastic pack |
| connector lock | five per heat-sealed pack |
| connector lock pin | one per transparent heat-sealed plastic bag (1990s production) |
| ejector assembly | two per heat-sealed pack |
| elevation knob and spindle | twenty per black cardboard tube |
| extractor spring and plunger | twenty per heat-sealed pack |
| firing pin | two per heat-sealed pack or cellophane bag, twenty twin packs per black cardboard tube |
| flash suppressor | one per black cardboard tube or heat sealable wrap |
| flash suppressor nut | ten per black cardboard tube |
| flash suppressor nut wrench | one per heat-sealed pack |
| front band | one per heat-sealed pack |
| front sight screw | 100 per box |
| gas cylinder | two per black cardboard tube and five tubes per box or two inside cheese cloth wrapper |
| gas cylinder lock | one per heat-sealed pack |
| gas cylinder plug | five per heat-sealed pack with cardboard sleeve around the threads or five per heat-sealed pack wrapped in a single piece of vapor barrier paper |
| gas piston | one per heat-sealed pack or transparent heat-sealed plastic bag |
| lubricant case | 72 per cardboard box |
| hammer spring | fifty per paper and / or plastic bag with oil sprayed on the parts (1981 production) |
| M2 aiming device | one per cardboard box |
| M2 bipod modification kit | one kit wrapped in foil inside a sealed cheese cloth wrapper |
| M5 winter trigger (with or without safety) | one wrapped in foil paper inside cardboard tube inside heat-sealed pack |
| M6 bayonet | one per cardboard box inside transparent heat-sealed plastic bag |

| | |
|---|---|
| M6 bayonet grip, left or right | ten per cardboard box inside transparent heat-sealed plastic bag |
| M14A1 stock without hardware | ten per carton |
| M76 grenade launcher | one per cardboard tube |
| M151 vehicle mounting kit | one per cardboard box |
| M1907 small arms sling | one per heat-sealed transparent plastic bag |
| M35 truck mounting kit | one per cardboard box |
| magazine | one or four per heat-sealed pack or two per cardboard sleeve with outer plastic wrap (1960s production) and blue plastic bag (1990 and later production) |
| magazine latch | one per heat-sealed pack |
| operating rod | two per black cardboard tube (1960s production) and transparent heat-sealed plastic bag (1980s production) |
| operating rod guide | one per heat-sealed pack |
| operating rod spring | two per heat-sealed pack |
| operating rod spring guide | one per heat-sealed pack or ten per cardboard tube |
| rear sight aperture, National Match hooded | one per heat-sealed pack |
| rear sight base | one per heat-sealed pack |
| rear sight cover | twenty per black cardboard can |
| rear sight elevation knob and spindle | cardboard tube |
| rear sight windage knob | twenty per black cardboard tube |
| safety | one per heat-sealed pack |
| safety spring | one per heat-sealed pack or 100 per box |
| selector spring | one per heat-sealed pack, twenty per black cardboard can |
| selector switch | one per heat-sealed pack |
| selector switch and spring | one set per cellophane bag (1960s production) |
| sling swivel, rear | one per heat-sealed pack |

| | |
|---|---|
| small arms sling, nylon | one per heat-sealed pack |
| spindle valve | ten per heat-sealed pack or 100 per cardboard can |
| stock, National Match (9352638) | one per transparent heat-sealed plastic bag (1980s production) |
| stock ferrule, National Match | one per heat-sealed pack (1990s production) |
| stock repair screws | twenty per transparent heat-sealed plastic bag |
| stock screw, wood, upper butt | one per heat-sealed pack |
| stock subassembly, National Match (11010282) | ten per cardboard box |
| swab holder | ten per envelope |
| trigger and sear assembly | two per heat-sealed pack |
| trigger guard | one per heat-sealed pack |
| trigger housing (with magazine catch, spring and pin) | one per heat-sealed pack |

USGI M14 Magazine Packaging - In the 1960s, USGI M14 magazines were wrapped in one of three ways: 1) cheese cloth on the outside and chemical vapor barrier wrapper surrounding the magazine on the inside 2) oil preservative wrapper or 3) chemically treated cardboard sleeve inside a sealed transparent plastic wrap. Either method protected the magazine from moisture inside the package while it remained sealed. Chemically treated sealable wrapping paper was not available until about 1985. Packaging of USGI M14 parts was inspected by government employees as part of the production contract.

As with other USGI parts, the USGI M14 magazine packages were printed with specific information to identify the contents. Markings from a package from 1968 serves to illustrate what information was indicated (from top to bottom): first line – 1005-628-9048 is the Federal Stock Number second line – MAGAZINE ASSY is the nomenclature third line – 2-EA is the quantity fourth line – DAAG-25-68-C-0402 is the contract number fifth line – A-MAR-1968 is the year and date the magazines were packaged. From at least 2004 onward, Check-Mate Industries packaged its USGI contract M14 magazines in blue color plastic bags for the U. S. military. Check-Mate Industries magazines produced in 2005 and 2006 for the U. S. government contract kept the RESTRICTED USE - LAW ENFORCEMENT / GOVERNMENT USE ONLY marking on the magazine body rear side.

**Notes on Commercial Parts**

Commercial manufacture and Chinese M14 parts are available in much smaller quantities than what USGI parts were back in the 1960s and early 1970s. While certain commercial parts are available at the time of this writing that may not be the case in the future.

Badger Ordnance - Established in 1982, Badger Ordnance specializes in the manufacture of firearms precision tools, gauges, accessories and scope mounts and rings. It offers a fluted National Match operating rod spring guide designed to minimize spring binding and drag. The Badger Ordnance operating rod spring guide (part number 223-05) was introduced in its 2004 Product Catalog. The Badger Ordnance spring guide is made from a single piece of AISI 4142 molybdenum-chromium alloy steel.

LRB of Long Island, Inc. - LRB Arms gas cylinders are forged by Bourdon Forge and machined by J V Precision Machine Co. These were introduced to the commercial market in March 2008. At the same time, LRB Arms began marketing faux flash suppressors with bayonet lugs and M14E2 style muzzle brakes. Both of these muzzle attachments consist of demilitarized USGI flash suppressor front sight dovetail sections welded to new muzzle devices. In the case of the faux flash suppressor, the USGI bayonet lug is retained for aesthetic reasons. The faux flash suppressor complies with California law. The M14E2 style muzzle brake is similar to the first version USGI M14E2 muzzle stabilizer in appearance except the bayonet lug has been removed and the right hand side of the muzzle device has three radial holes. The three radial holes keep the muzzle from moving to the right during fire. The demilitarized USGI flash suppressor front sight dovetail sections were supplied by Armscorp USA, Inc. The muzzle attachments were welded together at a machine shop in Bridgeport, CT.

Canadian Manufacture Parts - In 2004 and 2005, Laszlo Klementis, doing business as Rooster33 (Chilliwack, BC), produced a M14 type operating rod spring guide and a M14 bolt lock. Its operating rod spring guide was CNC machined from a single piece of 410 stainless steel bar stock. As of early 2006, Rooster33 parts were no longer available from the manufacturer. By early 2009, Marstar Canada made a match grade operating rod spring guide sized for the Chinese operating rod spring. It was made from stainless steel.

Sadlak Industries, LLC – Sadlak Industries, LLC develops, markets, and sells various rifle parts, industrial components and tooling. It is the distribution agent of Sadlak Innovative Design Company. Sadlak Innovative Design Company is a manufacturing job shop and machine design company that was founded in 1989. Mike Sadlak is the President of Sadlak Industries, LLC. He was introduced to the M14 rifle by competition shooter and gunsmith David Ferrante. In 2002, Mike Sadlak asked David Ferrante what parts could be made from a stock of certified titanium on hand. This titanium billet was production contract over run made for Pratt & Whitney. Mr. Ferrante suggested M14 scope mounts and Sadlak Industries agreed. By March 2003, Sadlak Industries was producing high quality steel and titanium scope mounts and an operating rod spring guide for the M14 type rifle.

Sadlak Industries makes National Match operating rod spring guides out of AISI 8620 alloy steel. These spring guides are case hardened to between 40 and 45 HRC. The Sadlak Industries spring guide design is based on the Brookfield Precision Tool part but is an improvement in that it uses a single piece of solid steel stock. In 2003, Sadlak Industries manufactured a single batch of 100 operating rod spring guides with a hollow shaft from two pieces of material.

Sadlak Industries also manufactures National Match gas pistons from AISI 420 stainless steel. One version has the cylindrical portion highly polished. The other version is first polished then coated with titanium nitride. Sadlak Industries, LLC consulted a large firm specializing in metal coatings. Mike Sadlak met with the technical experts at this metal coating firm, showed them the M14 gas system parts and explained to them the nature of the application for a coated gas piston. The gas piston moving forward and aft inside the gas cylinder subjects it to heat and abrasiveness. The coating firm analyzed the situation and selected a specific ingredient mixture of titanium nitride for the M14 gas piston. This specific titanium nitride coating is approximately 0.0001 " thick but it results in high anti-galling and anti-seizing properties. The benefit to the M14 type rifle owner is smoother gas system operation and improved gas system service life.

Sadlak Industries can machine the National Match / M21 groove into the gas piston per the USGI part number 9352724 upon customer request. The firm recommends using match grade ammunition for rifles assembled with the National Match groove gas piston. Otherwise, short cycling of the bolt may occur with military surplus or commercial ammunition. Sadlak Industries also offers very slightly oversized gas pistons to fit worn customer supplied gas cylinders. These custom order gas pistons are typically 0.0002 " or two ten-thousandths of an inch wider than the USGI outside diameter specification. The Sadlak Industries 2006 SP3 production lot gas pistons were marked: top line - SADLAK INDUSTRIES LLC bottom line - COVENTRY CT USA SP3. Sadlak operating rod spring guides and gas pistons are marked SADLAK INDUSTRIES LLC. The U. S. Army 173$^{rd}$ Airborne Brigade equipped twenty-two accurized M14 rifles in the fall of 2004 with Sadlak Industries operating rod spring guides and titanium nitride coated gas pistons.

Sadlak Industries, LLC was testing chromium plated M14 gas cylinders in late 2004 and early 2005 as a means to extend the service life. A very thin layer, 0.0001 " thick, of dense chromium was applied to the interior surface of the gas cylinder. This created a smooth surface less subject to wear. The conclusion of this testing was that it is more affordable to produce custom made oversized gas pistons than to plate the gas cylinder bores.

In July 2007, Sadlak Industries and FFL John Bourguignon of Patriot Armory (NC) collaborated on the design and manufacture of eight heat treated and phosphate coated M14 extended magazine latches. After testing and evaluation by volunteers, the first production lot of 140 Tactical Magazine Release Latches were available in June 2008.

Smith Enterprise, Inc. - Smith Enterprise has made or presently does make the following M14 parts: flash suppressors, gas cylinders, gas cylinder plugs, gas pistons, gas cylinder locks, spindle valves, muzzle brakes, operating rod springs, hammer springs, stock ferrules, extended and standard bolt locks, combination gas cylinder lock front sights and National Match (front and rear) sight parts. Smith Enterprise combination gas cylinder lock front sights, bolt locks, extended bolt locks and non-threaded versions of the flash hiders are made of carburized and hardened AISI 8620 steel. The standard barrel and M1A SOCOM barrel muzzle attachment kit parts are made from stress proof AISI 1144 steel.

February 2007 saw the first production run of forged gas cylinders by Smith Enterprise, Inc. A total of 200 gas cylinders were made including some with the M80HT treatment. The following month, the firm manufactured 130 gas pistons and another 200 gas cylinders. The gas cylinders and gas cylinder plugs are made from AISI 416 stainless steel with the gas cylinders being machined from forgings. The gas cylinder plugs and some gas cylinders are given the proprietary M80HT heat treatment resulting in a surface hardness of 60 HRC. After receiving the M80HT heat treatment, the gas cylinders, gas cylinder plugs and gas pistons are cryogenically treated. The 420 stainless steel gas pistons then receive a thin dense chromium plating.

The hammer spring is made from chromium silicon alloy steel of a thinner diameter wire and has 2 ½ more coils as compared to the USGI hammer spring. Smith Enterprise, Inc. also cuts and polishes barrel chambers using Douglas medium weight and heavyweight blanks. Match style and USGI design operating rod spring guides manufactured by Smith Enterprise, Inc. became available in November 2008. These spring guides were M80HT treated. A month later, the firm completed its first production run of 200 operating rods. Due to growing scarcity of quality M14 parts, Smith Enterprise is expanding its manufacturing of M14 parts while maintaining high quality.

Smith Enterprise offers a safe and reliable adjustable M14 firing mechanism to the public. This adjustable firing mechanism is an optional accessory for the M14SE rifle system. A member of the U. S. Army 5$^{th}$ Special Forces Group was testing it in Iraq in 2004 and into 2005. To make this unit, a USGI firing mechanism is modified by adding parts hidden inside the stock. The rifle stock requires only about 1/8 " of inletting to accommodate the adjustable firing mechanism. The trigger pull can be simply and easily adjusted anywhere from 1.75 to 5 pounds. It remains a two stage trigger even at 1.75 pounds pull. The design utilizes two springs and two plungers, one set for the trigger and another set for the sear. This removes any influence of the hammer spring on the trigger pull. An M14 rifle equipped with the Smith Enterprise, Inc. adjustable trigger can be quickly restored to a standard firing mechanism in the field.

Smith Enterprise, Inc. has supplied many of its products to the military branches in fulfillment of government contracts as well as making them available on a limited basis for commercial sales. With that in mind, the manufacturer part numbers for M14 related items offered by Smith Enterprise, Inc. are listed here:

0001AK - M14 direct connect sound suppressor
0002AK - M14 direct connect sound suppressor, lightweight
1018 - MD Labs XF7 weapons lubricant, syringe container
1019 - MD Labs XF7 weapons lubricant, tube container
2000V - direct connect flash hider
2001 - U. S. Coast Guard muzzle brake
2001V - M1A SOCOM muzzle attachment kit
2002V - dovetail flash hider
2003 - extended bolt lock
2005 - scope mount, Trijicon, Inc. Advanced Combat Optical Gunsight compatible
2006 - scope mount, 5.38 " long
2007 - scope mount, 10 "
2008 - scope mount, 7 "
2009 - scope mount, PVS-22
2010 - bolt lock
2011 - combination gas cylinder lock front sight - dovetail for 22 " barrel
2012 - combination gas cylinder lock front sight - hooded for 18 " and 22 " barrels
2013 - combination gas cylinder lock front sight - dovetail for 18 " barrel
2015 - direct connect California compensator
2017 - combination gas cylinder lock front sight wrench
2018 - front sight - tritium post
2019 - front sight - tritium dot
2020 - strap on cheek rest, ACU pattern
2021 - strap on cheek rest, black
2023 - M1907 leather sling
2024 - M21A5 C-IED mid-range trigger upgrade
2025 - M21A5 22 " medium contour molybdenum-chromium alloy steel barrel
2027 - M14 18 " standard contour molybdenum-chromium alloy steel barrel
2028 - M21A5 22 " standard contour molybdenum-chromium alloy steel barrel
2029 - connector lock pin, S-7 tool steel
2030 - gas cylinder shim set
2033 - bipod, quick detachable
2050 - M21A5 stock tri-rail mount system
2060 - pin and spring kit for firing mechanism
2070 - USGI design gas cylinder
2071 - M80HT treated gas cylinder
2075 - gas piston, thin dense chromium plated
2076 - gas cylinder plug, M80HT treated
2087 - M21A5 C-IED Max-Pak trigger upgrade
3005 - suppressor and tool carrier

Springfield Armory, Inc. - Springfield Armory, Inc. began making parts in the late 1970s as the supply of USGI M14 parts became limited. Commercial reproduction trigger housings marked 7267030-G were installed in M1A rifles as early as April 1978 and as late as May 1984. Standard model M1A serial number 007041 left the factory in 1977 with a commercial manufacture barrel and a commercial manufacture operating rod. In the 1980s, some M1A rifles were assembled with commercial reproduction investment cast rear sight bases marked SA 554600 on the bottom.

A National Match model M1A produced in 1978, serial number 00909X, was assembled with a commercial bolt at the factory. This particular bolt has no markings except for the letter N on the rear end. These cast bolts are referred to as the "lettered series" bolts. A standard model M1A with serial number 0093XX left the factory in early 1979 with a commercial non-plated standard contour barrel, commercial operating rod and commercial bolt. M1A serial number 010047 was assembled in 1979 at the factory with a "lettered series" M1A bolt, reproduction ejector and M1 Rifle ejector spring. The "lettered series" cast bolt on M1A serial number 010047 was tested for cracks and hardness by an Ohio National Guard armorer. No cracks were found by magnetic particle inspection. The bolt hardness was 55 HRC. However, the bolt firing pin hole was larger than required by the USGI drawing. By April 1979, Springfield Armory, Inc. had changed to "numbered series" reproduction bolts in M1A rifles.

From 1978 to 1986 Springfield Armory, Inc. was short on USGI M14 barrels so it installed non-plated standard contour barrels. The standard contour barrel blanks were supplied by Wilson Arms. Springfield Armory, Inc. M1A medium weight stainless steel National Match barrels are marked NM 308-SS. The medium weight molybdenum-chromium alloy National Match barrels are marked NM 308. The barrel marking is located between the gas cylinder and the flash suppressor. Douglas Barrels, Inc. supplied the stainless steel blanks for standard loaded model M1A barrels.

Springfield Armory, Inc. commercial reproduction operating rods are made from two pieces of steel welded together as was done by Springfield Armory, Winchester and Harrington & Richardson. Springfield Armory, Inc. offers an adjustable firing mechanism for sale. The trigger pull can be adjusted from 1 ½ to 4 ½ pounds by using an adjustment screw not visible from outside the stock. It was designed by Dale Rader. Mr. Rader was head of the Match Shop at Springfield Armory, Inc. from July 2000 to January 2009.

Springfield Armory, Inc. M1A rifles built from the mid-1980s to 1994 *tend* to be built with a majority of USGI parts. For example, M1A serial number 081004 (assembled in 1994) was built at the factory with the following parts: TRW trigger housing, HR-N hammer, TRW bolt, Winchester barrel, and WCE USGI rear sight elevation and windage knobs. There are USGI parts on M1A rifles built from the mid-1990s until the present day but they are the exception rather than the rule, especially from 2002 onward.

Troy Industries, Inc. – In 2005, Troy Industries offered an extended magazine release and a bolt lock for the M14 type rifle. These parts were machined from steel bar stock and finished with manganese phosphate coating. The extended magazine release was similar to the USGI part with smooth rounded edges but was a little longer and wider with a convex surface facing the trigger guard. These parts, catalog numbers M14EMR and M14CBR, are no longer available.

W. C. Wolff Company - Walt Wolff, Sr., a U. S. Army veteran of World War II, established his gunsmithing business in 1951. He found it difficult to find replacement springs for the firearms he was asked to repair. After a time, he bought a small hand-operated machine to make his own coil springs for firearms. Other gunsmiths found out about this source of gun springs. Soon, the W. C. Wolff Company (Newtown Square, PA) was advertising in industry periodicals and filling direct mail orders. By the late 1950s, Brownells, Inc. became the first distributor of Wolff springs. Later, Mr. Wolff invented extra power and reduced power springs. In the late 1970s, he introduced the variable power recoil spring for M1911 type pistols. Today, W. C. Wolff Company produces quality M14 type rifle ejector springs, extractor springs, hammer springs, ten and twenty round magazine springs, and operating rod springs. Wolff springs are all made from the same proprietary material.

Wayne Machine Inc. – Wayne Machine Inc. of Taipei, Taiwan was established in 1979 and moved to its present location in May 1994. It manufactures ordnance components, combat vehicle parts and military and commercial firearms parts. Wayne Machine Inc. exports 90 % of its production to the United States, United Kingdom, and other countries. It lists the Taiwan Army as one of its customer references. Since the mid-1980s, Wayne Machine Inc. has made and supplied reproduction M14 parts to Century Arms International, Numrich Gun Parts Corporation, Sarco, Inc., and Springfield Armory, Inc.

In 1996 or 1997, Numrich Gun Parts Corporation received a shipment of cast reproduction operating rods from Taiwan. They had Winchester markings. Apparently, Wayne Machine Inc. had been sent a Winchester M14 operating rod as a sample. Most commercial M14 type rifle parts are cast. The April 2004 M14 products list of Wayne Machine Inc. includes the gas cylinder, flash suppressor, M14E2 muzzle stabilizer, front sight, rear sight parts, hand guard assembly, and firing mechanism parts but not the bolt or operating rod. Commercial manufacture M14 bolts have been cast, machined from bar stock and forged. These reproduction parts usually function in a satisfactory manner when fitted and assembled correctly.

Other Commercial Parts Suppliers - Gerald Drasen, who did business as Nesard and Sendra (Chicago, IL), went into the firearms parts business no later than 1963 selling M1 Garand rifle and M1911 pistol parts. He produced reproduction M14 items such as the flash suppressor nut wrench, bolt assembly tool, front band, gas cylinder, magazine latch, rear sight cover, safety and trigger housing in the 1980s. His business continued to sell reproduction M14 items until at least 2002. Brookfield Precision Tool made match grade operating rod spring guides and titanium-nitride coated gas pistons from 1988 to 1996. In 2004, DPMS, Inc. (St. Cloud, MN) sold a high quality lugged flash suppressor manufactured in South Korea. Further importation of these flash suppressors has been blocked by U. S. Customs & Border Protection.

In 2005, F A Enterprises was manufacturing a M14 flash suppressor nut, also known as a castle nut. It is made from AISI 1018 carbon steel and has a blued finish. Superior Shooting Systems, Inc. (Canadian, TX) M14 type rifle chromium silicon alloy steel operating rod springs and hammer springs are rated for 500,000 cycles. Arrowhead Industries (Afton, MI) manufactures various firearms parts including M14 gas pistons from AISI 420 stainless steel and M14 gas cylinder plugs from AISI 416 stainless steel. Arrowhead Industries M14 gas pistons and gas cylinder plugs are only sold to its distributors, e.g., Sherluk (Delta, OH). The Amherst Depot (Englewood, FL) sells reproduction M14 parts including safeties, hammers and rear sight apertures. Fulton Armory offers commercial manufacture extractors milled from bar stock.

**Notes on Chinese Parts**

USGI and commercial manufacture parts are theoretically interchangeable but occasionally the fit is too tight or too loose between each other. Generally, USGI and commercially manufactured parts are interchangeable with their Chinese counterparts but there are some exceptions.

Barrel - Chinese barrels have metric dimension barrel shank, gas cylinder lock and suppressor nut threads. However, the Chinese barrel shank thread size is very close to the American made receiver barrel ring thread size. Chinese M14 barrels will usually, but not always, thread into an American made M14 type receiver without any trouble. Nonetheless, barrel installation and headspacing should be performed by a reputable M14 gunsmith. A USGI gas cylinder lock will not fit on a Chinese barrel because of the differing thread sizes. Similarly, the Chinese gas cylinder lock will not fit on a USGI or U. S. commercial manufacture M14 type barrel.

Chinese flash suppressor nut-to-USGI barrel - The Chinese flash suppressor nut will go on without resisting but at a slightly downward angle due to the slight difference in threads.

USGI flash suppressor nut-to-Chinese barrel - The USGI and Chinese flash suppressor nuts are interchangeable on the Chinese barrel.

Bolt - For unknown reasons, the Chinese did not use equivalent AISI 8620 alloy steel for their bolts as specified per the USGI drawing but elected to make them out of equivalent AISI 4135 alloy steel. Chinese bolts have a surface hardness of 40 to 47 HRC which is too soft. This applies to Chinese bolts exported to the United States prior to June 1994. If the bolts are heat treated to improve the hardness, the hardness increases all the way through the bolt instead of just at the surface. Hardening a Chinese bolt will add only a little more service life to the bolt to the item. In the long term, however, hardening a Chinese bolt is still not desirable. This is because increasing the core hardness of the bolt decreases the core toughness.

Another significant problem plagues Chinese bolts imported into the United States. Besides not being made of a material suitable for long term use, the locking lugs are too narrow. Thus, American and Chinese bolts are not interchangeable except in very rare instances. The owner of a Chinese M14 rifle with a Chinese bolt should not expect a USGI bolt to drop in to the Chinese receiver. Even if a USGI bolt does fit the Chinese receiver, it may headspace less than the safe minimum, 1.630 ", or it may headspace longer than the SAAMI maximum, 1.634 ". Converting a U. S. imported Chinese M14 type rifle to accept an American made bolt should be performed by an experienced M14 gunsmith.

These problems may or may not continue to affect Chinese M14 bolts which were more recently exported. For example, three Norinco M305 rifle bolts shipped to Canada in 2003 were tested for surface hardness. The results ranged from a minimum of 45 HRC to 48.5 HRC, with the average at 47 HRC. More detailed information on the bolt material or the core hardness of these 2003 vintage bolts is presently unavailable.

Firing Mechanism - The machining of Chinese firing mechanism parts is comparable to USGI firing mechanisms. The Chinese trigger guard is made with the bent tab stop similar to the late version USGI trigger guard. Chinese hammers and triggers are sometimes a little soft, but this can be corrected with appropriate nitrocarburizing treatment. The pin sizes and locations in the Chinese unit are the same as the USGI original. Occasionally, a Chinese hammer pin or trigger pin may be too soft or machined slightly too narrow.

Gas System - Chinese gas cylinders and gas cylinder plugs are made of molybdenum-chromium alloy steel and gas pistons are chromium plated. Chinese and American gas cylinder plugs are not interchangeable. The Chinese gas cylinder plug has 25.4 threads per inch and the USGI gas cylinder plug has 40 threads per inch. The Chinese gas piston outside diameter and the gas cylinder inside diameter are slightly larger than USGI gas piston and gas cylinder drawing specifications. A USGI gas piston may be too narrow to function properly inside a Chinese gas cylinder. The inside diameter of a Chinese operating rod spring is about 0.010 " smaller than a USGI spring. Some National Match operating rod spring guides will not fit inside Chinese operating rod springs because the interior diameter is too small.

Operating Rod - Three kinds of operating rods have been identified on Chinese semi-automatic M14 type rifles. One kind has no notch at all for the connector assembly. Since this version cannot be used with a connector assembly, it is likely post-1978 production. Another has an almost straight angle cut to the notch, which does not closely match the USGI connector's contours. These operating rods have numbers engraved on them. The notch *may* have been machined away after original manufacture. The third type of Chinese operating rod has a connector notch very similar to the USGI model, but with a slightly more circular shape. The third type was made in 1965 as part of the production of 100,000 complete rifles. In all other important dimensions, the three types of Chinese operating rods are the same. Chinese operating rods are forged and are as hard as USGI Harrington & Richardson operating rods.

Rear Sight Assembly - Chinese and American rear sight knobs and bases are not interchangeable because the Chinese sight parts have about 36 threads per inch versus 32 threads per inch for the standard USGI rear sight parts. However, a complete Chinese manufacture rear sight assembly will fit on an American made receiver and vice versa. The Chinese rear sight base is a casting.

Stock Assembly - Chinese connector locks were standard length in 1965 production M14 rifles but shortened to sit flush with the receiver in post-1978 production rifles. USGI stocks require some filler material to prevent lateral drift of the shortened Chinese connector lock.

Chinese butt plates and butt plate flappers are both made of steel. The butt plate is a casting. The flapper-to-butt plate joint is built up by welding then ground flat. Two types of Chinese M14 butt plate flappers have been observed: Type 1) the flapper has two raised indentations on the right side of the hinge and Type 2) the flapper has one hole on the left side of the hinge as the muzzle is pointed down range.

Chinese M14 firing pins have a gray color phosphate coating. Chinese flash suppressors are castings. The bolts and operating rods of Chinese M14 rifles imported in May 2006 into Canada have etched numbering on the bolts and trigger housings and W C E is marked on the elevation knobs. Chinese M14 parts differ in their markings from U. S. parts as follows:

**Table 31: Chinese M14 Rifle Part Markings**

| Chinese Rifle Part | Identifying Marks |
|---|---|
| barrel | no markings except for KFS and CAI imported Poly Technologies and some CAI imported Norinco rifles |
| bolt | may have numbers electro-penciled on the top or bottom |
| flash suppressor | electro-penciled number |
| hammer | no markings |
| hand guard | silver painted bottom that may have the letters DT and a number or a number by itself |

| | |
|---|---|
| operating rod | may have electro-penciled numbers and the connector notch shape is different from USGI design |
| trigger housing | five or six digit number |
| windage knob | counterfeit W C E |

**Commercial Parts Identification**

Barrels - Springfield Armory, Inc. in Illinois marked its USGI and commercial manufacture barrels SPRINGFIELD INC. GENESEO IL or GENESEO ILL or GENESO, IL 308. This marking is typically found on the barrel chamber. Chromium plated standard contour barrels supplied by Criterion Barrels, Inc. to Fulton Armory are stamped C.B.F.A. 7790190 followed by the month and year of manufacture. A 2004 production Wilson Arms chromium plated standard contour barrel sold by LRB Arms had the following markings: LRB 7790190 5/04 WA. Smith Enterprise, Inc. installed a Douglas 1:10 twist four groove heavyweight barrel on a M1A rifle in January 2003. The barrel was stamped with the following markings from top to bottom: first line - 1 10 308 WIN 1 03 second line - 4 35T SEI. At the bottom of the barrel at the rear end just forward of the op rod spring guide slot it was marked 1.

Bolt - Springfield Armory, Inc. M1A bolts are manufactured in the United States of America. The M1A bolts are typically marked 7790186-SA on the first line and A00030, B00048 or F00059 or similar number on the second line. They may have markings such as D and M3 on the rear end and A9 or B1 on the bottom surface. The letter A prefix for the number under 7790186-SA means the bolt was cast then finish machined. The letter B prefix for the number under 7790186-SA means the bolt was machined from bar stock. The letter F prefix for the number under 7790186-SA means the bolt is forged. Springfield Armory, Inc. began installing F prefix M1A bolts by no later than 2000.

See 1987 Springfield Armory, Inc. Recall Notice for additional M1A bolt markings. No M1A parts, including bolts, are made by metal injection molding. Around receiver serial number 165XXX, Springfield Armory, Inc. commercial manufacture factory installed bolts have letters and numerals with a taller and thinner font than the style found on USGI M14 bolts. A Springfield Armory, Inc. M1A bolt not subject to recall was tested for surface hardness. The result was 52 HRC, the same as a USGI HRT marked M14 bolt.

Gas System - Some Smith Enterprise, Inc. gas cylinders were electropenciled with the marking 3A5E1 S.E.I. LRB Arms gas cylinders are marked 12182. This number stands for L (twelfth letter of the alphabet) R (eighteenth letter of the alphabet) B (second letter of the alphabet). Spindle valves with a round head are commercial manufacture.

Operating Rod - Springfield Armory, Inc. M1A operating rods are manufactured in the United States of America. The handle portion from the saddle rearward is made from an investment casting. The cylindrical portion of the operating rod is cold rolled. An Illinois machine shop is subcontracted to machine the bolt roller cam slot. The welding of the two pieces together, the deep hole drilling of the cylindrical portion and the finish machining are performed in-house. Every M1A operating rod is heat treated and phosphate coated.

On Springfield Armory, Inc. operating rods, look for either: 1) 7267064 on the first line and SA centered below it or together in one line 2) 7267064-2 on the first line and SA centered below it. The first example is the earlier of the two markings. Springfield Armory, Inc. operating rods with the early marking, no -2, will not have a notch under the handle like USGI operating rods. By no later than 1993, the notch under the handle was added to its operating rods, e.g., M1A-A1 serial number 0748XX. For clarity, U. S. government Springfield Armory operating rods are marked 7267064 SA all on one line and are machined with the notch under the handle but may or may not have the forward end vent hole.

Rear Sight Base - A rear sight base marked NM/2A on the right hand side and BST2 on the bottom is most likely a commercial reproduction. A part marked NM/2A with no other markings may be a commercial reproduction.

Firing Mechanism - For commercial Springfield Armory, Inc. trigger housings, look for part numbers 7267030-G, 7267030-H, 7267030-I or 7267030-S. Springfield Armory, Inc. hammers may be unmarked or marked on the side: top line - 5546008-2 bottom line - SA.

**USGI Magazines**

The M14 magazine design was finalized by John C. Garand in the first five months of 1954 while he was a consultant to Mathewson Tool Company on the T44E4 rifle contract. The M14 magazine design was borrowed from Garand's T31 rifle project. The T31 (and M14) magazine design requires very low cartridge stripping forces. Rochester Manufacturing Company (Rochester, NY) developed the welding procedure for the M14 magazine parts.

Springfield Armory, government contractors and commercial magazine manufacturers have at one time or another produced five, ten, fifteen, twenty, twenty-five and thirty round magazines for the M14 type rifle. The five, fifteen, twenty-five and thirty round magazines are commercially manufactured but not marked with any manufacturer's initials. The Springfield Armory, Inc. M1A description in the 1987 *Shooter's Bible* lists magazine capacity as five, ten, twenty, and twenty-five rounds.

A seven round magazine was produced by the U. S. Army MTU for use with the XM21 in Viet Nam. The XM21 seven round magazine was small enough to allow the sniper to assume a lower position with the rifle yet long enough to allow the magazine to be removed quickly. The U.S. Department of Defense contracted with several companies to supply five, ten and twenty round M14 magazines. For example, Check-Mate Industries, Inc. made ten round magazines about 1990 for the U. S. Army Marksmanship Unit. The five round M14 magazines were made by Check-Mate Industries but supplied by Springfield Armory, Inc. to the U. S. Department of Defense. The U. S. Marine Corps uses both ten and twenty round magazines in the M14 DMR. For comparison purposes, the approximate length of the magazine tube (body) rear side for the various sizes are: five round - 2.25 ", seven round - 2.58 ", ten round - 3.44 " and twenty round - 5.75 ".

Usually, the U. S. government contractor manufacturer initials were marked on the rear side of USGI M14 magazines. Quantico Arms & Tactical Supply, Inc. purchased a batch of 12,000 New-In-Wrap USGI twenty round M14 magazines in 2004. Quantico Arms found that about 20 % of these magazines either had no manufacturer marking or the initials were very faint. At least at some point, the manufacturer's marking on the magazine body became required per USGI drawing F7790181. USGI Borg-Warner magazines have been unmarked straight from packaging dated as early as January 1963.

The following manufacturer initials have been observed on magazine follower stops: BW and B-W (Borg-Warner), CTX (unknown) and OM (Winchester). The manufacturer's marking on the magazine follower is optional per USGI drawing B7267085. If a USGI magazine follower has spot welds on the flat portion of the stop, there will be three evenly spaced weld "dimples" or "buttons." BRW S-I and OM magazines were assembled with BW and OM marked followers, respectively, in 1962.

Be aware that some commercial reproduction M14 magazines have USGI contractor style markings on the rear side and the packaging has been expertly copied. Such "GI" style reproduction magazines may not charge and reliably feed twenty cartridges. The magazine body thickness of these magazines may be thinner than genuine USGI units. A genuine USGI M14 magazine will hold and reliably feed twenty cartridges then activate the bolt lock. This function requirement for the M14 magazine is stated on USGI drawing D7790183.

The savvy collector can identify genuine USGI and Taiwanese government manufacture M14 magazine bodies. Examine the spot welds on the front side of a known USGI or Taiwanese twenty round magazine. Make notes on the size, number, alignment and location of the spot welds. Note that some KMT marked magazines differ from the typical pattern of USGI magazine body spot welds. The USGI drawing F7790181 requires twelve evenly spaced spot welds up the center of the front side and one spot weld just to the right of the operating rod spring guide hole as the magazine stands up. Use this information when examining M14 magazines for sale.

Drawing D7790197 allows for the latch plate to be attached to the magazine body by two, four, five or six welds. USGI M14 magazine latch plate weld dimple patterns were consistently the same pattern according to manufacturer. The following latch plate dimple patterns have been consistent for genuine USGI magazines:

two dimples with a horizontal line immediately above the bottom pair - CMI
four dimples - W, bar W, HR-R
five dimples with the fifth centered - Atwood Vacuum Machine, UHC
five dimples with the fifth placed towards the top pair - BRW S-I, BRW B2
five dimples with the fifth placed towards the bottom pair - OM, OM over a dot
six dimples - KMT
six dimples with a horizontal line immediately above the bottom pair - CMI

The USGI drawing D7790197 (magazine body assembly) does not specify a manufacturer's marking but drawing F7790181 (magazine tube) does. USGI magazine springs were coated with lubricating oil before packaging. Beginning in January 2007, Check-Mate Industries ten and twenty round magazines made for commercial sales are marked C.M.I. on the rear side of the magazine tube with no other markings. The Check-Mate Industries five round magazines remained unmarked.

USGI magazine contractors included Apex Metal Stamping Co., Atwood Vacuum Machine Co., Borg-Warner, Brunswick Sports Products, Check-Mate Industries, Killeen Machine & Tool, Olin-Mathieson Chemical (Winchester), Rochester Manufacturing, Springfield Armory, TRW, Union Hardware Company and Westinghouse Electric. Check-Mate Industries made twenty round M14 magazines for 1989, 1996, 2004 and 2005 U. S. Army contracts. The 2005 contract is for a guaranteed minimum of 25,000 and up to a possible maximum of 360,000 twenty round magazines. Check-Mate Industries marked some of its ten round magazines C.M.I. on the rear side of the body (tube). The USGI magazines are generally regarded as the best made.

Magazine body (tube) wall thickness can vary from 0.028 " to 0.041 " as observed among USGI, Chinese, Taiwanese and U. S. commercial manufacture M14 magazines. The specification per USGI drawing F7790181 for the body (tube) thickness is 0.0310 " + or - 0.0015 ". If a magazine body is too thick, e.g., 0.041 ", it may fail to lock the bolt open after the last round is fired.

The following *incomplete* timeline of contractors has been developed from observations made while opening new-in-wrap genuine USGI M14 magazines.

**Table 32: Timeline of USGI Magazine Contractors**

| Production Year(s) | USGI M14 Magazine Manufacturer |
|---|---|
| 1959 | Union Hardware Company |
| 1961 | Atwood Vacuum, Brunswick Sports Products, Rochester Manufacturing (for Harrington & Richardson), Westinghouse Electric (W marking) |
| 1962 | Borg-Warner Spring Division, Brunswick Sports Products, Olin-Mathieson Chemical Corporation (OM marking), Westinghouse Electric |
| 1965 | Killeen Machine & Tool Co. |
| 1967, 1968 and 1969 | Borg-Warner Spring Division |
| 1970 | Killeen Machine & Tool Co. |
| 1990 | Check-Mate Industries |
| 1996 and 1997 | Check-Mate Industries |
| 2004 through 2007 | Check-Mate Industries |

Note that assembly of a complete twenty round M14 magazine from spare parts may be a violation of applicable local or state law in the United States, or may violate Canadian law. Possession, manufacturing, importation, sales or transfer of centerfire rifle ammunition magazines capable of holding more than five rounds may be prohibited or restricted in U. S. cities and states. Under present Canadian law, magazines for the M14 type rifle and other centerfire long guns are pinned to limit the capacity to five cartridges. Consult state and local laws before purchasing or accepting any firearm magazine.

M14 magazine replacement parts have been available in the civilian market since about 1989 from Sarco, Inc. Replacement M14 magazine springs should be inspected for signs of any defects and for proper dimensions. Genuine T44E4 and twenty round M14 magazine springs have eight coils. The replacement magazine followers should have three neat and evenly spaced spot welds attaching the stop to the follower. USGI M14 magazine followers are heat treated to file hard. Consequently, do not bend the rear tab on USGI M14 magazine followers any appreciable distance as they will snap off. If the rear tab is bent significantly and it does not snap off, it is likely a commercial reproduction part.

USGI M14 magazines have been modified to fit other rifles such as the Armalite, Inc. AR10, IMI Galil .308 caliber AR, ARM and SAR models and modified M1 Garand rifles. During the ten years of the Assault Weapons Ban, M14 magazines modified for use in the AR10 were required to still function in the M14 type rifle to remain compliant with the law. Since the sunset of the ban, new manufacture AR10 magazines are being made by Check-Mate Industries for Armalite. After 2004, a modified M14 magazine is known as a Generation I AR10 magazine and the post-’04 manufacture units are referred to as Generation II magazines. A Generation II AR10 magazine will not function in a M14 type rifle. For a time, Marc Krebs of Krebs Custom, Inc. (Wauconda, IL) modified Russian made Molot brand .308 caliber RPK style rifles to accept unmodified USGI M14 magazines.

The Australian International Arms 7.62 x 51 mm caliber bolt action M10 series rifles use a ten round M14 magazine. These rifles were briefly imported in 2003 and 2004 into the United States by Tristar Sporting Arms, Ltd. (North Kansas City, MO). Tristar Sporting Arms specializes in shotguns for women shooters. It was established in 1994 by Marty Fajen, former Vice President at Reinhart Fajen, Inc. and daughter-in-law of the esteemed stockmaker. Beginning in 2005, Marstar Canada imported the M10 rifles into Canada. The ten round M14 magazines exported to Canada with the M10 rifles use a smaller latch plate than the USGI design. This prevents a twenty round M14 magazine from being used in the M10 in order to comply with Canadian law.

**Foreign Manufacture Magazines**

Taiwan and People's Republic of China also produced twenty round magazines that were imported from the late 1980s until 1994. Some Chinese twenty round magazines were blocked to five rounds capacity by welding a metal block under the follower following the 1989 import ban. Such magazines were included in the shipping boxes for Chinese M14 rifles imported by Century Arms International and IDE USA. While Chinese magazines are narrower than the USGI magazines, they have an excellent reputation for reliability. Chinese magazines imported into the United States in the 1980s and 1990s were coated with grease. Chinese magazines imported into Canada after 2000 were preserved with oil and packed in heat-sealed transparent plastic bags. Canadian plastic twenty round magazines have also been imported into the United States. These magazines have a good reputation but may require a small amount of plastic to be removed from the locking tab to feed reliably.

**U. S. Commercial Magazines**

Aftermarket magazines often fail to function reliably because of their thinner body sheet metal, weak springs and flashing on their plastic followers. U. S. aftermarket brand twenty and thirty round magazines were produced before September 13, 1994 by companies such as Triple K Manufacturing Company (San Diego, CA) and USA Magazines, Inc. (1992 mailing address in Downey, CA). USA Magazines, Inc. made blued twenty and thirty round magazines but appears to have gone out of business by July 2005.

Herman and Leo Krasne established the San Diego department store, Krasne's Incorporated, in 1946. Triple K Manufacturing Company was founded in 1963 by Jerry Krasne, son of Leo Krasne and grandson of Herman Krasne. Triple K is a division of Krasne, Inc. and remains a family owned business. Triple K stands for Kim, Kurt, and Karen, the three children of Jerry Krasne. Triple K manufactures leather goods for firearms carry and rifle and pistol magazines. In 2007, the Triple K company produced blued finish five, ten, twenty and thirty round magazines for the M14. The catalog numbers were 572M, 567M, 1018M and 1995M, respectively.

A plastic twenty round M14 magazine was developed in 1977, patented in 1979 and manufactured by D. & D. Inc. (Wilson, NC). The magazine body is marked as follows on the right hand side adjacent to the floor plate: top line - THERMOLD second line - D.& D. INC. third line - WILSON, N.C. bottom line - U.S.A. The magazine floor plate is marked on the bottom as follows: PAT NO 4139959. A thirty round model was distributed by

Toblas Guns (Albemarle, NC) in 1989. A plastic five round magazine charger was also manufactured. The plastic charger is identified is marked as follows: left hand side - PAT. NO. 4,538,371 right hand side - THERMOLD D. & D. INC. WILSON N.C. U.S.A.

Springfield Armory, Inc. sold twenty round M14 magazines blocked to five or ten rounds at least during the period 1978 to 1980. The sporterized five round magazine which sits flush with the stock was first offered in 1980.

After the Assault Weapon Ban sunset in 2004, ProMag Industries (South Gate, CA) manufactured twenty round magazines (product number M1A-A1). The ProMag Industries magazines had blued finish carbon steel bodies, chromium silicon alloy steel springs and polymer floor plates and followers. Likewise, 9.14 Magazine and National Magazines also made M14 magazines after 2004. 9.14 Magazine made phosphate coated five, ten and twenty round models. National made five, ten, twenty, twenty-five and thirty round units in either blued or phosphate finish.

Check-Mate Industries has manufactured ten, fifteen, and twenty round magazines for Springfield Armory, Inc. Its 2005 and 2006 production twenty round magazines for the commercial market have no manufacturer markings. In the summer of 2006, Armalite, Incorporated (Geneseo, IL) sold 2006 production Check-Mate Industries twenty round magazines with its brand logo stamped on the exterior side of the floor plate. Beginning in January 2007, Check-Mate Industries stamped its retail sale twenty round magazines with the marking C.M.I. on the rear side. As of February 2008, the crossed cannons logo of Springfield Armory, Inc. appears on the rear side of twenty round magazines manufactured by Check-Mate Industries for Springfield Armory, Inc. The same logo appears on fifteen round magazines as of March 2009. Until 2009, Springfield Armory, Inc. M1A fifteen round magazines used a twenty round body with a wood block under the follower to prevent loading more than fifteen rounds. By March 2009, the magazine body was sized perfectly for fifteen cartridges.

In October 2007, Check-Mate Industries made available through a distributor, 44Mag Distributing, its twenty-five round M14 magazine. The extra five rounds of capacity added about 1.25 " in length over the standard twenty round model. This magazine was marked C.M.I. on the rear side and had the Check-Mate logo stamped on the bottom of the floor plate. The spring for the Check-Mate twenty-five round magazine had eight coils and was interchangeable with the twenty round magazine.

Viking Tool and Machine made a small batch (less than ninety) of seventy-two round Beta C style M14 magazines before the 1994 Assault Weapons ban on new “large capacity” magazines. This conversion consists of cutting then screwing an MG-15 saddle drum to a Viking magazine tower. These M14 type drum magazines have been used at the legendary Knob Creek Machine Gun Shoot held every April and October in West Point, KY. These magazines commanded a premium price during the ten years the 1994 Assault Weapons ban was in effect.

In 2007 and 2008, 44Mag Distributing and John Masen Company marketed replacement magazine followers, floor plates and twenty round magazine springs. The replacement parts sold by 44Mag Distributing were supplied by Check-Mate Industries.

**Miscellaneous Notes on Scope Mounts**

Mathewson Tool Company in 1954 designed a means to mount an optical scope on the T44E4 receiver. This design feature was adopted by the U. S. government as part of the M14 receiver. After its involvement with the T44 and M14 rifle projects, Mathewson Tool Company moved from New Haven to Orange, CT by no later than July 1965. The firm was awarded at least forty-four weapons and ammunition programs contracts from 1965 to 1975 by the U. S. Army and U. S. Air Force. The last contract was awarded to Mathewson Tool Company in March 1975 with estimated completion for June 1975.

Brookfield Precision Tool, GG&G, Leatherwood Brothers, and Smith Enterprise mounts have been purchased by the U. S. military for match conditioned M14 type rifles. GG&G made its M14 scope mounts for the U. S. Marine Corps M14 DMR. The GG&G M1A1 scope mount had two small rail pads, one at the cartridge clip dovetail and the other located above the barrel ring. It was designed with a horizontal key but not a vertical key to avoid fitment issues. It was marked G.G.&G. TUCSCON, AZ. on the horizontal outboard surface. At least two of the GG&G scope mounts were sold to private individuals. The iron sights could be used with the mount installed.

Picatinny Arsenal conducted a study on the difficulties of mounting a scope on the M14 rifle. The U. S. Naval Surface Warfare Center (Crane, IN) also worked on the issue. Scope mount adapters were made for the AN/PAS-4 and AN/PVS-1, -2, and -3 night scopes (NSN 5855-00-941-3036) by GPC Night Vision (CAGE Code 1YE66) and the AN/PVS-4 night scope by Brookfield Precision Tool. The scope mount adapter was issued as part of the AN/PAS-4 sight.

The variety of commercial M14 scope mounts and rail systems today make the M14 a versatile platform. The type of optics to be employed will dictate the choice of scope mount or rail system for the rifle. For a traditional hunting rifle scope, a side three point scope mount provides a stable method of attachment while adding minimal weight to the system. The Global Defense G1-OSM or Smith Enterprise (part number 2005) side three point mounts are excellent choices for mounting the Trijicon, Inc. Advanced Combat Optical Gunsight. If the mission requires several optics, the Troy Industries MCS or Vltor Weapons Systems CAS-14 Cluster Rail provide the maximum amount of uninterrupted rail space for the M14. Other options for M14 systems requiring generous rail space include the LRB Arms M25 receiver or a side three point scope mount in concert with a Sage International M14 EBR stock. A barrel rail mount is useful for extended eye relief scopes.

**Side Single Point Scope Mounts**

Side single point design scope mounts attach to the receiver left hand side using the only bolt hole, with alignment-theoretically at least-assured through firm contact with the receiver's horizontal and vertical grooves. These mounts do not require removal of the cartridge clip guide, while some other mounts do. Side single point scope mounts include those made by Basset Machine, Israeli Military Industries, Leatherwood Brothers, S&K Manufacturing Co., Springfield Armory, Inc., and the U. S. Army Weapons Command.

In 1966, the Army Weapons Command at Rock Island Arsenal developed a scope mount for the M84 scope to be used on the M14 NM rifle. This scope mount was a two piece affair. The machined base had an integral rail and vertical and horizontal keys to mate to the receiver grooves. The base was attached to the receiver by either a hex head socket screw, large knurled knob screw or a small know with a screwdriver slot. The bases were made of aluminum or steel. The finish of the base was blued, black oxide or phosphate.

The M84 scope was held by a Griffin & Howe, Inc. hinged mount borrowed from the M1C sniper rifle. The scope and mount assembly was secured to the base rail by throw levers. The base had a clearance undercut at the top of the vertical exterior surface to allow free movement of the Griffin & Howe, Inc. mount levers. The scope was centered over the receiver when in use. To use the iron sights, the hinged Griffin & Howe, Inc. mount was rotated counterclockwise to move the scope outboard of the receiver.

The first commercial M14 rifle scope mount was offered by Pete Michaels from 1971 to 1974. This side single point scope mount was a quality copy of the Rock Island Arsenal model used on the M14 NM rifles in the Republic of Viet Nam. There were two versions of this reproduction item. Both versions were made of phosphate coated steel and had horizontal and vertical keys. One version had a clearance undercut at the top of the vertical exterior surface like the Rock Island Arsenal unit. The other copy lacked the clearance undercut.

The Israeli Military Industries scope mount borrowed from the U. S. Army Weapons Command M14 NM mount for its interface with the receiver with its vertical and horizontal receiver keys. It also included integral scope rings. It was made of steel and finished with phosphate coating. The Israeli M14 scope mount was marked 2888-89058 along with Hebrew characters and the serial number of the USGI receiver to which it was mounted.

S&K Manufacturing Co. (then in Pittsfield, PA and now known as S&K Scope Mounts) started producing scope mounts for surplus military rifles in the mid-1960s. It introduced one of the first commercial production M14 scope mount in late 1974 (catalog number 1765). It was of the side single point design and made from two black anodized pieces of machined 2024 alloy aluminum. The top piece was screwed to the side piece. The top portion of the mount had two blued finish split 1 " scope rings secured by setscrews. The rings and screws were made from steel. The S&K scope mount attached to the M14 type receiver by one thumbscrew and alignment ribs.

Bill Bassett opened his machine shop in 1951 and made his first scope mount for the M14 type rifle in 1979. The Bassett Machine SM14-1A scope mounts were sized for two different heights and made from 6000 series alloy aluminum except for the hardened stainless steel keys that mated to the receiver grooves. The original design was modified twice with minor improvements through the years to facilitate ease of use. The approximate weight of the mount was 4 ounces. The SM14-1A scope mount had two angled mounting pads for accepting Weaver style rings and was marked on the outboard side: top line - BASSETT MACHINE bottom line - DRIPPING SPRINGS, TEXAS. The Bassett scope mount bolt was designed to be sufficiently tight at 22 in-lbf of torque. The mount was designed such that If the same torque is consistently applied upon installation, the scope will return to within one-half minute-of-angle of its initial zero at 100 yards.

In 2007, Mr. Bassett produced two new prototype "flat top rail" scope mounts, one for Weaver rings and the other for Picatinny style rings. Both solid rail design scope mounts were made to center the scope over the bore and be machined with a relief angle on the underside to help ensure case ejection from the rifle action. In August 2008, the first batch of Bassett Picatinny rail scope mounts was produced and offered for sale. This mount had a channel milled through the center of the rail to allow the operator to use iron sights up to thirty-two clicks of elevation even with a scope installed. The rail portion was designed so that the cartridge clip guide could remain installed. It was marked on the outboard side: top line - BASSETT MACHINE bottom line - DRIPPING SPRINGS TEXAS.

The Springfield Armory, Inc. First Generation aluminum scope mount was first advertised in the February 01, 1975 issue of *Shotgun News.* The Springfield Armory, Inc. A.R.T. IV scope mount was a two piece unit. The top plate was secured to the side plate by three screws. Split ring scope rings attached to either end of the top plate. The side plate was stamped SA A.R.T. IV. This item was available in 1989 and 1990. The Springfield Armory, Inc. scope mounts accept Weaver style rings. Early Leatherwood Brothers scope mounts were made of aluminum and used a single point of contact to the receiver on the XM21 rifles.

**Side Two Point Scope Mounts**

Side two and three point scope mounts are generally manufactured to accept either of two rail geometries, Weaver style or Picatinny style. The Picatinny rail design is also known as MIL-STD-1913 or NATO STANAG 2324. The terms are interchangeable. The Weaver design is more often used to mount optics on commercial market rifles. The Picatinny rail mounts are generally found on military design firearms. The difference in the dimensions between the two designs is important. The nominal overall rail width for the Weaver design is 0.834 " but it is 0.856 " for the Picatinny rail.

The side two point design scope mount uses the receiver bolt hole and the cartridge clip guide to secure the mount. The cartridge clip guide must be removed before this type of scope mount can be installed. B-Square, Marstar Canada, McCann Industries, Springfield Armory, Inc. Third Generation, XTA and latter military issue Leatherwood Brothers mounts mount on the side of the receiver at two points. The U. S. Army armorers installed Leatherwood Brothers side two point alloy aluminum scope mounts on M21 rifles.

The XTA 5100 alloy aluminum M14/M1A scope mount utilizes a 6.13 " long Weaver style rail. It allows limited use of the iron sights and is marked M14/M1A SCOPE MOUNT on the outboard vertical surface. It has a matte black anodized finish. The XTA mount is very similar in appearance to the Springfield Armory, Inc. Third Generation scope mount. This scope mount was marketed by John Masen Company and New Century Science & Technology, Inc. in 2006 and M1Surplus in 2007.

Beginning in 2006, Marstar Canada offered the M-14 Deluxe Tactical Scope Mount (part number M14-103). This was an alloy aluminum scope mount designed and manufactured in Canada for Marstar. This CNC machined scope mount used a substitute cartridge clip guide made of carbon steel. It had horizontal and vertical receiver keys and a Weaver style rail. The McCann Industries M1A/M-14 mount was made of steel and came with two Weaver style ring bases. An optional full length M1913 Picatinny rail is interchangeable with the Weaver style ring bases on the McCann Industries mount using the four factory supplied screws.

The rifle iron sights can be used up to about an elevation of 200 meters with a Springfield Armory, Inc. scope mount. At higher elevation settings the mount will block the shooter's vision through the rear sight aperture. The Springfield Armory, Inc. Third Generation mount uses a supplied substitute guide that replaces the cartridge clip guide. It was designed and first manufactured some time between 1975 and 1990. The Springfield Armory, Inc. Third Generations scope mount is marked on the side as follows: top line - SPRINGFIELD ARMORY bottom line - Geneseo, Illinois. The catalog number is MA5038. This scope mount has a rail 6 1/8 " long. It uses a hybrid rail geometry that is best suited for Weaver style scope rings.

**Side Three Point Scope Mounts**

Mounts that have three points of contact with the receiver are very reliable for keeping the scope zeroed under all conditions, including removal and re-mounting on the receiver. This type of scope mount contacts the M14 type receiver at the scope mount lug on the left side, at the cartridge clip guide and on top of the barrel ring. Note that side three point scope mounts are not always compatible with rail system mounts or modular chassis stocks. The rear end of the top rail on a rail system mount or a modular chassis stock may interfere with the front end of the side three point scope mount.

Commercial M14 manufacturers do not and never have guaranteed that their receivers meet the dimensional tolerances of USGI M14 receiver drawing F7790189. As such, slight dimensional differences exist between USGI and commercial manufacture M14 receivers. On the other hand, several, but not all, manufacturers have designed their scope mounts to fit USGI M14 receivers without making any accommodation for commercial manufacture receivers. The bottom line for shooters wishing to use a scope sight on an M14 type rifle is that side three point scope mounts do not always fit hand-to-glove on all M14 type receivers. This scope mount style is very popular among M14 rifle enthusiasts. The overall rail length on this type of scope mount varies from 5 " to 10 ". Several models are described below.

Brookfield Precision Tool - The Brookfield Precision Tool mount was developed by Mitch Mateiko. He made the first scope mount in his work shop at home out of steel and subsequently always used steel for his scope mounts. The Brookfield Precision Tool scope mount was installed on U. S. military XM25, M25 and M14 SSR rifles. It was sold in the commercial market for a number of years. Brookfield Precision Tool scope mounts and other parts now command a premium due to the collector value. The Brookfield Precision Tool mount was made from an investment casting. It allowed the shooter to use the rifle's iron sights with or without the scope installed. It was a M1913 Picatinny style rail with a cam type mounting bolt designed to fit all four makes of USGI M14 receivers. Brookfield Precision Tool scope mounts were marked as following on the outboard side, BKFLD PREC TL U S PROPERTY.

One small production batch of Brookfield Precision Tool M14 scope mounts were marked with BKFLD PREC TL PAT PEND on the mounting bolt side. There was also a lightweight version of the Brookfield Precision Tool scope mount. The lightweight scope mount had lightening holes drilled along the entire length of the top rail and two relief cuts made on the under side at the front and at the rear. It was marked with a stamped L on the right hand side just to the right of the manufacturer marking. None of the Brookfield scope mounts were machined with a case deflection angle on the underside.

Smith Enterprise, Inc. - Smith Enterprise scope mounts are made from nitrocarburized AISI 4140 alloy steel. Their surface hardness is approximately 60 HRC and they have a matte black finish. As of 2003, the Smith Enterprise MIL-STD-1913 Picatinny rail tactical scope mount was stocked in the U. S. military supply system. This mount allows the shooter to use the iron sights with or without the scope installed. It is in use by the U. S. Army 25$^{th}$ Infantry Division and the U. S. Navy. On September 28, 2005, Smith Enterprise was awarded a contract by the U. S. Army 101$^{st}$ Airborne Division to supply deploying units with this scope mount along with its 30 mm heavy duty scope rings and Leupold & Stevens, Inc. 3.5-10X 40 mm scopes to deploying units. This scope mount was marked NSN 5855-01-506-5750 U. S. PROPERTY.

It is manufactured using the wire electro-discharge machining (EDM) method. EDM can be described as spark erosion of metals by local heating and melting. This metalworking method holds very tight tolerances and leaves burr free surfaces.

In April 2005, Smith Enterprise made available a 7 " rail length version of its wire EDM manufactured scope mount to the U. S. Air Force and U. S. Marine Corps. This scope mount was assigned the National Stock Number 1005-01-533-8160 on September 28, 2005 by the Defense Supply Center - Columbus. This scope mount is marked: Smith Ent. "Crazy Horse" MIL STD 1913 United States Property NSN 1005-01-533-8160.

In April 2006, Smith Enterprise, Inc. introduced its Trijicon, Inc. Advanced Combat Optical Gunsight compatible scope mount for the M14 rifle. This mount is made by the wire EDM manufacturing method. The material is AISI 4140 alloy steel. Initially, it was marked: inboard side - US PROPERTY SMITH ENT NSN 1005-01-535-4430. Later versions are marked: outboard side - UNITED STATES PROPERTY inboard side - NSN 1005-01-535-4430. The advantage of this scope mount is the detachable MIL-STD-1913 Picatinny rail. The user can quickly swap a traditional rifle daylight scope for a Trijicon, Inc. Advanced Combat Optical Gunsight. There is no loss of zero when the daylight scope is reinstalled. The detachable rear rail section is removed and installed by loosening or tightening the bolts with a t-shape handle hex head wrench. This scope mount does not have a see through channel so iron sights are not available with the mount on the rifle.

The Smith Enterprise, Inc. 10 " scope mount was introduced to the market in July 2007. This scope mount allowed the use of iron sights without a scope mounted and had a MIL-STD-1913 rail pattern. It was compatible with the Trijicon, Inc. Advanced Combat Optical Gunsight. It was marked simply UNITED STATES PROPERTY.

Smith Enterprise's earlier M14 scope mounts were made using conventional machining methods but are nonetheless just as trouble-free and durable. The older model Smith Enterprise rail scope mounts were produced in two versions, Weaver style rail and MIL-STD-1913 rail. This earlier MIL-STD-1913 version was sold to the U. S. Army in the late 1980s and 1990s. These scope mounts were marked SMITH ENTERPRISE. TEMPE. AZ M21.

The older Smith Enterprise Weaver style rail mounts were manufactured in 1994. These mounts were marked SMITH ENT. XM-21. This scope mount was briefly reintroduced in 2006 as part number 2024 with the marking SMITH ENT. M-21. Both Weaver style rail mounts were made using conventional machining methods.

The Smith Enterprise scope mount has a three degree upward slope on the under side of the rail, just above the rifle's bolt. This allows ejected brass to clear the action while minimizing any contact with the mount because of varying receiver geometries among the manufacturers. This mount utilizes a cam type mounting bolt to compensate for the differing position of the bolt hole on various makes of rifles. For demonstration purposes only, Ron Smith installed a Smith Enterprise scope mount on a commercial manufacture M14 type receiver and torqued the receiver mounting bolt in increments to 140 in-lbf. There was absolutely no damage to the bolt, mount or receiver. In field use, 65 in-lbf of torque is sufficient for installing any scope mount. In December 2008, Smith Enterprise, Inc. made available a replacement scope mount cam bolt. This cam bolt was made from 17-4 precipation hardening stainless steel and capable of withstanding a minimum of 250 in-lbf of torque. Installation instructions are included with every scope mount sold by Smith Enterprise. The mount installation instructions are also posted at its web site. Smith Enterprise will custom fit its M14 scope mounts to customer supplied commercial M14 type receivers.

Armscorp USA - The Armscorp USA M14 scope mount was a very faithful copy of the milestone Brookfield Precision Tool mount. It was machined from steel and heat treated to U. S. military specifications. It had an adjustable cam bolt. The iron sights could be used with this mount installed without removing the scope. The Armscorp USA side three point scope mount was marked as follows on the side ARMSCORP U.S. PROPERTY.

Atlantic Research Marketing Systems, Inc. – Atlantic Research Marketing Systems (CAGE Code 0FBA6) was established by Richard Swan. His 1983 dovetail style rail design for mounting firearm optical sights was adopted by the U. S. Army Picatinny

Arsenal on February 03, 1995 as the MIL-STD-1913 accessory rail. MIL-STD is an abbreviation for Military Standard. This rail mount design is referred to as the M1913 Picatinny rail. Atlantic Research Marketing Systems produces a wide variety of optical sight mounting rails for firearms.

Its # 18 mount is designed for use on the M14 type rifle. The # 18 mount has been made in two versions. The early style was first introduced to the commercial market in 1989. It had two base pads, one at each end, for mounting the scope rings. A few of the early style mounts had an integral cartridge clip guide in the rear pad, useful only when mounted on the receiver without a scope installed.

Introduced in 2003, the new style # 18 mount has a full-length rail running from the cartridge clip guide dovetail to the top of the barrel ring. The new style # 18 mount has similar markings as the early style unit. Both models are M1913 Picatinny style rails. Both versions are marked as follows on the side below the bolt: first line - A.R.M.S. M21/ M14 W.B. MA. 98 second line – NSN 1240-01-316-0055. There are four additional markings above the bolt: company logo, registered trademark indicator, 18 and SWAN. The new style # 18 is made of case hardened AISI 8620 alloy steel. Both styles of the # 18 scope mount are made from investment castings. The overall rail length for both versions is 4 9/32 ".

The # 18 scope mount sits low enough on the receiver to allow use of the iron sights if the scope is removed. It sits the lowest over the rifle's bore of any scope mount available. Due to differences in commercial receiver geometry the user may find that a little judicious removal of metal at the underside corner of the mount's front end may be necessary to get a # 18 mount to fit perfectly. The Atlantic Research Marketing Systems # 20 throw lever mount will secure an AN/PVS-4 night vision scope to a M14 type rifle fitted with a Weaver style rail scope mount.

Mil-Spec Logistics, Inc. - This firm marketed a side three point scope mount that was based on the Brookfield Precision Tool design. It was made of steel and had two moderate length Picatinny rail pads instead of a full length rail. The outboard vertical surface of the mount was marked MIL SPEC LOGISTICS, INC.

Sadlak Industries - Since 2002, Sadlak Industries has produced scope mounts for the M14 rifle. This company offers its M1913 Picatinny style rail scope mounts manufactured from three different materials, titanium, steel and aluminum alloys. The rail length is the same for each model, 5 3/8 ". The Sadlak Industries M14 scope mount is based on the Brookfield Precision Tool model.

Sadlak Industries incorporated some new enhancements to its M14 scope mount in late 2004. Two setscrews securely hold the wider adjustable dovetail piece (clip guide key) to the rifle's receiver, to keep it from loosening. The rear end of the scope mount has cutouts to allow wrench access to the dovetail setscrews. The dovetail setscrews securely lock the dovetail piece (clip guide key) into the receiver. The scope mount hole for the adjustable dovetail piece (clip guide) screw has been machined with an oval slot and a larger counterbore to make it more easily compatible with non-USGI receivers. The front post screw size has also been increased for a larger contact area with the receiver barrel ring. The front screw has also been changed from a ¼ " x 28 fine thread to a 5/16 " x 24 fine thread. The new size front screw reduces the number of hex head wrenches from three to two. The front screw and the dovetail key socket screw now both use the same size hex head wrench. 2006 production scope mount weights were 7.258 ounces (alloy titanium), 11.113 ounces (4142 alloy) and 4.331 ounces (7075 alloy).

Its titanium scope mounts were machined from hot rolled billet and then heat treated to a hardness of 26 to 30 HRC. From 2002 to 2006, the titanium scope mounts were made from two alloys of hot rolled titanium billet: 1) 6 % aluminum 4 % vanadium 89 % titanium 2) 6 % aluminum 5 % vanadium 2 % tin 87 % titanium. After heat treatment, the titanium mounts are finished with a matte black nitride coating for improved corrosion and abrasion resistance. This coating increases the surface hardness to approximately 80 HRC. The Sadlak titanium scope mount is tougher and stronger than steel but about 35 % lighter. A Sadlak Industries titanium M14 scope mount made in 2004 was marked SADLAK INDUST. LLC COVENTRY CT USA M14 T-02.

Before 2005, the manufacturer information was located on the inboard side of the mount. From 2005 and onward, the marking is indicated on the outboard side of the mount. Scope mounts are coded by a single letter prefix and a two digit number, e.g., S03. T stands for titanium and S for steel. The number means the blueprint revision for the scope mount made from the material denoted by the letter, e.g., S or T. There are slight changes between blueprint revisions. As an example, T-02 scope mounts have a two degree relief angle under the horizontal surface. T-03 scope mounts will have a five degree relief angle under the horizontal surface.

Sadlak's standard design steel scope mounts were made from stress relieved AISI 4142 bar stock with a core hardness of 28 to 32 HRC. The steel mounts were given a military specification manganese phosphate coating. A Sadlak Industries steel scope mount made in 2006 was marked: top line - SADLAK INDUSTRIES LLC M14 RIFLE Steel middle line - COVENTRY CT bottom line - USA. The scope mount markings changed slightly over time.

A 7075 alloy aluminum-magnesium-zinc version of its M14 scope mount was in testing in November 2004. This alloy is commonly used to fabricate aircraft frames. The 7075 alloy M14 scope mount is fully machined and hard coat anodized. It became available in early 2005. In early 2006, Sadlak Industries produced a small batch of anodized gray 7075 alloy scope mounts. Otherwise, the 7075 alloy models have been anodized black.

The original alpha-titanium-carbon-nitride coating used on the titanium model was not always as consistent in color as desired. Sadlak Industries, LLC does not compromise on its quality control. So, those off-color mounts have been rejected even though all other inspections were satisfactory. Unfortunately, the rejection rate due to improper color only was unacceptably high. Consequently, as of late 2004, Sadlak Industries was testing a second and more color consistent matte black nitride coating as well as a tungsten coating for the titanium M14 scope mounts. The tungsten coating is even more durable than the nitride coating and has a slight greenish-gray phosphate coloring reminiscent of older military weapons. The tungsten coating was so successful that the black nitride coating for titanium scope mounts was discontinued in 2005.

Beginning in early 2005, a five degree relief angle is machined into the bottom of its scope mounts to minimize interference from spent cases in rifles with worn ejector springs. Sadlak Industries produced in March 2005 a single batch of six tungsten coated version S03 steel scope mounts. In April 2005, Sadlak Industries started a custom scope mount fitting service to accommodate non-USGI dimension receivers and / or allow for elevation adjustment. At the end of September 2005, Sadlak Industries filled a request from the U. S. Army for ninety-eight steel M14 scope mounts.

The Sadlak Airborne model M14 scope mount was produced per request of the U. S. Army 101st Airborne Division in September 2007. The Army Division requested a lighter steel version of the Sadlak standard M14 scope mount. Sadlak Industries, LLC produced the requested quantity of twenty in time for the unit to deploy. Another six of the Airborne M14 scope mounts were sold to another U. S. Army division shortly thereafter. The Airborne model weighs 80 % of the standard steel scope mount. Lightening holes were drilled and counterbored along the entire length of the rail. Two relief cuts were made on the underside and the side wall metal was cut away on either side of the bolt hole. It was machined from molybdenum-chromium alloy steel bar stock, heat treated to 45 to 50 HRC, and given a manganese phosphate finish. Like the standard steel model, the iron sights may be used with scope rings attached and it retained the underside five degree case deflection angle. The additional marking, ABN, was added to the bottom of the outboard side of this model scope mount.

Entreprise Arms, Inc. - Entreprise Arms offered a Weaver style rail scope mount. It was machined from AISI 4140 alloy steel. The Entreprise Arms web site listed the mount in two lengths, standard and extended (catalog numbers TT18 and TT18E). The standard length model had a rail length of 5.3 " and weighed 11 ounces. The Entreprise Arms mounts allowed the shooter to use the rifle iron sights with or without the scope installed. The Entreprise Arms M14/M21 scope mounts had a military specification phosphate coating.

Global Defense Initiatives, Inc. – In 2003, Global Defensive Initiatives, Inc. (San Diego, CA) designed and produced a side three point mount that differed somewhat from the classic Brookfield Precision Tool design. Its G1 Optical Sight Mount (G1-OSM) allows the use of iron sights with the scope removed or installed. However, the M1913 Picatinny rail extended rearward to a point just behind the rear sight aperture. The rear sight assembly stayed in place with the mount installed. The G1-OSM mount accommodated an optical sight requiring very short eye relief between the shooter and the ocular lens. Thus, the versatility of the G1-OSM design allows the use of traditional telescopes and dot sights as well as Trijicon, Inc. Advanced Combat Optical Gunsight without the use of rail adapters. The G1-OSM was finished with a black oxide coating. The side hex locking screw torque specification is 55 in-lbf.

Two years later, Global Defense Initiatives (GDI) introduced its second generation G1-OSM scope mount. Initially, the second generation G1-OSM mount had a molybdenum disulfide finish but that was changed to a nitrocarburizing finish by mid-2005. The nitrocarburizing gave the mount a surface hardness of 70 to 72 HRC. The second generation also allows use of iron sights whether optics are installed or not. The G1-OSM Gen 3 Scout scope mount was developed and production started in 2008. This model has the same finish as its predecessor but it is more than 25 % lighter. It features an increased underside relief angle to further minimize stoppages from ejected cartridge cases. All versions of the G1-OSM scope mount are made from CNC machined 17-4 precipitation hardening stainless steel. GDI scope mounts lack a vertical key and are machined with an elongated bolt hole for better compatibility with commercial M14 receivers. All G1-OSM scope mounts are marked on the outboard side: GDI Inc. Pat. Pend. Made in USA.

Leatherwood Brothers, McCann Industries and Talbot – Leatherwood Brothers began advertising its new side three point rail mount in *Shotgun News* in 2004. All parts are made from steel. This mount weighs 8 ounces and allows the use of iron sights without the scope rings. There is no vertical key. It is adjustable for elevation and windage. It has a blued finish and will accept M1913 Picatinny style scope rings. Leatherwood Brothers began shipping its mount to customers in June 2004. The McCann Industries MITS mount is a side three point design unit that uses a unique three bolt design. Installation requires gunsmithing. A traditional design M14 bolt lock should be used in conjunction with the MITS scope mount as it may interfere with an extended bolt lock. The Talbot steel scope mount for the M14/M1A uses an optic mounting surface and quick detach combination dual ring and rail assembly that is common to the firm's many models of scope mounts. Various interchangeable dual ring and rail assemblies are available for the Talbot family of scope mounts. Talbot also offers a dual ring and rail assembly for M1913 Picatinny rail scope mounts.

Keng's Firearms Specialty, T T International and US Tactical Systems - These are moderately priced side three point mounts for the M14 type rifle. The Keng's Firearms Specialty unit has a M1913 Picatinny rail. The US Tactical Systems model has a Weaver style rail and is made from AISI 4140 alloy steel. It is heat treated and has a black color nitride surface finish. With the scope removed, the iron sights can be used with these mounts installed on the rifle. The TSA marked scope mount was marketed about 2004 by T T International. It was manufactured from hardened steel with a M1913 Picatinny rail.

ProMag Industries - ProMag Industries introduced two M14 scope mounts in 2006, product numbers PM081 and PM081A. The PM081 mount was made from steel. The PM081A mount was made from alloy aluminum and was of similar design as the Atlantic Research Marketing Systems, Inc. # 18 mount. Consequently, the PM081A mount will likely have fitting issues with commercial M14 type receivers. The end user must exercise care not to over tighten the ProMag Industries scope mount bolt. Doing so will strip the bolt threads. Both ProMag models use M1913 Picatinny rails.

Unertl Optical Company - In the summer of 2006, Unertl developed two prototype design M14 scope mounts. Both mounts were improved versions of the basic Brookfield Precision Tool design. Both models were made from alloy steel and had forward and rear M1913 Picatinny rail pads. The shorter of the two prototypes was about 6 " long. The rail pads had four slots each with the rear rail pad extending approximately 3/4 " past the front edge of the rear sight cover. The longer scope mount had an overall length of about 7 " with six front slots and two rear slots. The front rail pad of the longer mount reaches 2 " past the receiver barrel ring. This version better accommodates dot sight optics and scopes greater than 10X magnification. The open space between the two rail pads was designed to avoid stovepiping of spent cases. Both prototype scope mounts were marked on the left side UNERTL ORDNANCE with the company logo to the right of the lettering. The longer Unertl scope mount became available for sale in February 2007.

**Side Three Point Scope Mount Fitting on Commercial M14 Receivers**

There are five points of contact between the side three point scope mount and the rifle's receiver that may cause improper fit up with military design side three point scope mounts when installed on commercial M14 receivers. The surface contact between the left side of the scope mount and the left side of the receiver is of primary importance. The more contact between these two surfaces the less likely the mount is to shift from firing recoil. The scope mount should be tested first for fit without the cartridge clip guide dovetail key supplied with the mount.

Receiver Bolt Hole - The USGI M14 receiver drawing F7790189 specifies a distance of 1.500 " + or - 0.003 " for the distance between the bolt hole centerline and the front vertical edge of the barrel ring. If the bolt hole is drilled too far to the rear, the rear of the scope mount may contact the receiver cartridge clip guide dovetail. This lifts the back of the mount so the mount horizontal key doesn't fully seat in the receiver horizontal groove. Consequently, the mount is moved left or right, and usually also down, at the front end. The rifle is then likely to shoot high and/or to one side. Furthermore, some bolt holes are undersized because the maker used worn out reamers, or the bolt holes may not be drilled perfectly perpendicular to the receiver wall. A very few commercial receivers lack the scope mount recoil lug or bolt hole. Care must be taken to not exceed the torque specification for the manufacturer supplied scope mount bolt or screw. A torque wrench calibrated in in-lbf is the best tool to use for tightening the scope mount receiver bolt or screw.

Receiver Horizontal Groove - The height, angle and width of the horizontal groove affect the fit of side three point scope mounts to M14 type receivers. Some commercial receivers have horizontal grooves too shallow and narrow to accommodate military specification mounts such as the Armscorp USA, Brookfield Precision Tool and Sadlak Industries models. A 2002 manufacture commercial M14 type receiver examined by Sadlak Industries, LLC in December 2004 is a representative case study of the mismatch between commercial receivers and military dimension scope mounts. The receiver horizontal groove of this particular 2002 manufacture commercial receiver measured 0.048 " deep, 0.080 " wide at the bottom and 0.134 " wide at the top.

The width at the top of the receiver horizontal groove should be 0.0149 " to 0.153 " by calculation based on the sixty degree angle and groove bottom width dimension as specified in the USGI drawing number F7790189. The bottom of the horizontal groove is required to be 0.070 " to 0.078 " wide according to the USGI drawing F7790189. The horizontal groove should be 0.062 " to 0.072 " deep by calculation. Commercial M14 receiver horizontal grooves have been measured as narrow as 0.120 " at the top of the groove.

Receiver Barrel Ring - The top front left hand corner of the receiver barrel ring may interfere with the new style Atlantic Research Marketing Systems # 18 mount. This is no fault of Atlantic Research Marketing Systems, Inc. as its mount was designed to fit on USGI M14 receivers.

Receiver Cartridge Clip Guide Dovetail - The receiver cartridge clip guide dovetail may be machined such that the scope mount adjustable dovetail key will not slide in from the side of the bolt hole, but may do so from the operating rod side. The height of the cartridge clip guide dovetail may also be tall enough to push up on the rear end of the scope mount. The cartridge clip guide dovetail has been found to be as much as 0.030 " taller than USGI specification.

Barrel Hand Guard - The Atlantic Research Marketing Systems # 18 front rail pad setscrew may contact the hand guard. This can be remedied by replacing the mount's front setscrew with one that fits flush with the pad. Again, this is no fault of Atlantic Research Marketing Systems, Inc. Commercial M14 type receivers are not always machined to the USGI drawing F7790189 dimensions.

Smith Enterprise, Inc. has found as much as 0.010 " variance front to rear for the location of the scope mount bolt hole on USGI M14 receivers. In the 1990s, the U. S. Marine Corps and U. S. Navy had success with the Brookfield Precision Tool scope mounts since it was designed without a vertical key. However, the U. S. Marine Corps found that the location of bolt holes on Harrington & Richardson M14 receivers adversely affected mount alignment to require excessive windage adjustment to zero the scopes. The U. S. Marine Corps had no such problems with the Winchester M14 rifle receivers.

**Scope Mounts Secured to the Rear Sight Pocket**

In 1985, Smith Enterprise designed and produced pre-production units of two models of longer side three point scope mounts. Both were 9.250 " long. The rear end of both models mounted to the rifle's rear sight pocket, requiring removal of the rear sight assembly. The front end of the mount rail extended past the receiver barrel ring. One mount was TIG welded to the receiver, while the other was bolted on at the rear sight pocket through the sight knob holes. The heads of the bolts for the rear sight pocket were the same diameter as the sight knobs. The project was not pursued since it was found that the commercial market in 1985 was not ready for this new style of scope mount.

In years past, Atlantic Research Marketing Systems, Inc. marketed its M-14/M-1A Rigid Rail Mount. This mount had a ring at the front end that fit around the barrel just forward of the receiver barrel ring. The rear end of the mount fit inside the rear sight pocket and was secured by a bolt through the sight knob holes. The Atlantic Research Marketing Systems M-14/M-1A Rigid Rail Mount had a M1913 Picatinny rail and was offered in two choices of material construction and three differing lengths. The material was either phosphate coated AISI 4140 alloy steel or an aluminum rail with steel barrel ring. The aluminum and steel model was hard coat anodized for the surface finish treatment. The mount was available in standard, extended front or extended rear lengths. The flash suppressor, gas system and operating rod guide had to be removed to install this scope mount. Installation of this scope mount should be done by a gunsmith familiar with the M14 type rifle.

The Springfield Armory, Inc. M25 and Accuracy Speaks, Inc. M1913 Picatinny rail scope mounts both attach to the rear sight pocket instead of the cartridge clip guide dovetail and the barrel. The forward end of the M25 rail mount attaches to a ring that fits in a milled groove on the barrel chamber. Installing the barrel locks the front end of the M25 rail in place. The Accuracy Speaks mount will fit either the M1 Garand or M14 type rifle. This aluminum mount replaces the rear sight and firmly attaches to the barrel. Installation requires drilling and tapping the barrel and removal and modification of the hand guard.

In late 1997, Derrick Martin and Barrett Tillman conducted some accuracy testing of handloaded 175 grain .308 Winchester caliber ammunition in the Arizona desert. The test rifle was a modified and scoped Springfield Armory, Inc. M1A. This particular M1A was outfitted with a Douglas 1:10 twist bull barrel, a McMillan stock, a Harris bipod, and custom gas system. The test rifle had no iron sights. The rear sight assembly was displaced by the Accuracy Speaks, Inc. scope mount.

**Rail System Mounts**

C. Reed Knight has been supplying firearms related items to the U. S. military since 1986. His company, Knight's Armament Co., employed approximately 300 at its Titusville, FL plant in 2007. The firm produced an M16 Carbine style rail system for the M14 by no later than 2002. The rail system is known as the M14 RAS. It is offered in two models. The rear end of the top rail for both models ends at the receiver barrel ring. The deluxe model has a rear scope mount base that replaces the cartridge clip guide. The standard model resembles the deluxe model, but without the rear scope mount base. This is a very solid mount and is easy to install. The rear end of the M14 RAS bolts to the receiver scope mount bolt hole. It will only fit rifles with standard contour barrels. The RAS' side ribbed accessory panels will interfere with a National Match, JAE-100 or other oversized stock, but not USGI contour stocks. The M14 RAS is marked as follows on the right hand side from top to bottom: first line – KNIGHT'S ARMAMENT CO. second line – TITUSVILLE, FL third line – (321) 607-9900 fourth line – PN #22121. The company logo is just to the left of the text markings.

In 2004, C. J. Weapons Accessories (then Moreno Valley, CA later Jefferson City, MO) offered the Striker-14 M-14/M1A Tactical Rail System. This model used three M1913 Picatinny rails, with the rear end of the top rail attaching to the cartridge clip guide. The rifle's iron sights could be used with a scope installed. The Striker-14 unit attached to the rifle at three points. It was CNC machined from a single piece of aluminum and had a black anodized finish.

The Springfield Armory, Inc. M1A SOCOM II models are fitted with the VItor Weapons Systems CAS-14 rail system mount. VItor introduced the aluminum CAS-14 rail system mount at the 2004 SHOT Show. Springfield Armory, Inc. refers to the VItor rail system as the Cluster Rail. The M1A SOCOM II Cluster Rail has four M1913 Picatinny rails. This longer version of the VItor CAS-14 rail system has the twelve o'clock rail running from the front band to the cartridge clip guide. A shorter version of the CAS-14 mount terminates at the rear end of the barrel. Both versions attach to the M14 type rifle at the receiver scope mount bolt hole, the barrel hand guard band grooves and the operating rod guide. A U-shaped bracket is used to mate the CAS-14 rail system to the operating rod guide. A 3/8 " hex head bolt threads into the scope mount hole to fix it to the left side of the receiver. The longer CAS-14 mount uses two screws to mate the rear end to a substitute cartridge clip guide. The bottom portion of the M1A SOCOM II rail system can be quickly removed and left off the rifle by depressing two buttons at the rear of the stock and swinging the part downward.

Note that rail system mounts such as the VItor Cluster Rail, Knight's M14 RAS and C J Weapons Striker-14 are not compatible with conventional side one, two and three point contact scope mounts. This is because both types of systems utilize the receiver scope mount bolt hole.

Sage International, Ltd. - In early 2008, Sage International, LLC introduced a detachable cantilevered Picatinny rail sight base designed to bridge the M14 action. The forward end of the sight base mounts to the Sage M14 EBR type stock twelve o'clock rail or a barrel rail mount. The forward end of the base is fastened to the rail over the barrel by two lever actuated cams. A steel cartridge clip insert is placed on top of the USGI cartridge clip guide. The rear end of the cantilevered sight base has a stainless steel adjustment setscrew that threads into a hole on top of the cartridge clip insert. The setscrew is designed to prevent vertical and horizontal movement of the sight base. The cartridge clip insert is secured into the cartridge clip by tightening a locking setscrew on the front side of the insert.

Smith Enterprise, Inc. - The Smith Enterprise MIL-STD-1913 Tri Rail mount consists of three short Picatinny rail sections that are screwed through the USGI synthetic stock to 7075 T6 alloy aluminum backing plates at the three, six, and nine o'clock positions just aft of the stock ferrule. Initially introduced in 2006, the Picatinny rail sections were made from M80HT heat treated AISI 4140 alloy steel. By 2008, Smith Enterprise, Inc. was making the rail sections from hard anodized 7075 T6 alloy aluminum. This change in material reduced weight and cost of the part while retaining plenty of strength and stiffness for its intended use. The three and nine o'clock rails were 3 3/4 " long. The six o'clock rail with sling swivel could be had in either 1 ¼ " or 3 3/4 " lengths. Each part was marked SMITH ENT.

**Barrel Rail Mounts**

Springfield Armory, Inc. – Springfield Armory, Inc. offers a barrel scope mount for extended eye relief scopes. The M1A Scout Squad and SOCOM 16 models are sold with a hybrid style rail barrel scope mount installed. The Springfield Armory, Inc. barrel scope mount utilizes a rail geometry that will accept either Picatinny or Weaver style rings. End users of this mount report greater satisfaction with employment of Weaver style rings on Springfield Armory, Inc. scope mounts. This mount is made of die cast alloy aluminum and attaches to a standard contour barrel using six 7/32 " hex head screws that secure the upper half to the lower half of the mount. Medium weight and heavyweight M14 barrels and M1 Garand barrels cannot accept this mount. Springfield Armory, Inc. offers the Scout Squad scope mount finished in a choice of black or brown. Springfield Armory, Inc. also sells this item separately.

Rooster33 - Rooster33 produced and sold its own barrel scope mount from March 2004 until the second half of 2005. It was made of steel and sized only for a lightweight (standard) contour M14 barrel. The Rooster33 1 " long scope mount attached to the barrel by four hex head bolts. It had a manganese phosphate coating and accepted either Weaver style or M1913 Picatinny style rings.

Marstar Canada - By May 2007, Marstar was manufacturing its own barrel rail mounts (part number M14-104). These steel short length split ring rail mounts consisted of two halves that fastened to a standard contour M14 barrel by four hex head screws. The Marstar barrel rail mount will accept either Weaver or Picatinny style scope rings.

Amega Ranges, Inc. – Beginning in 2006, Amega Ranges offered a M1913 Picatinny rail barrel mount for the M14 type rifle. It is made from anodized black color 6005-T6 alloy aluminum. By May 2006, two variants were available. The M14-M1A Standard Military Model is made to fit USGI standard contour barrels. The M1A SOCOM Model can be installed on Springfield Armory, Inc. M1A Bush, Scout Squad and SOCOM models. Neither Amega Ranges scope mount will fit a Chinese made M14 barrel. The Amega Ranges rail mount runs from the front end of the barrel ring to the front band. The Amega Range barrel rail mount attaches to the M14 type rifle using hex head screws only.

D. D. Ross Company - As of 2006, D. D. Ross Company (Medina, OH) produced a M14 barrel rail scope mount designed for the contour of the heavyweight barrel. The scope mount was a M1913 Picatinny style rail. It attached to the rifle at two points, the cartridge clip dove tail and at the barrel about four inches forward of the receiver. The forward end of the rail terminated about 6 " forward of the receiver.

Midwest Industries – Introduced in 2005, Midwest Industries manufactures an anodized 6061 alloy aluminum dual M1913 Picatinny rail mount that attaches to the barrel over the gas cylinder (Item # MCTM14-1A). It is useful for attaching tactical lights or lasers. Any rail mount or bipod that is secured to the barrel may change the zero of the rifle. The rifle should be sighted in and test fired to check for any change in sight zero or accuracy after installation.

Ultimak - The Ultimak Model M8 scope mount is designed to attach to a USGI, commercial or Chinese M14 standard contour barrel only. The M8 mount runs the length of the barrel from the receiver to the front band. The scope mount is a M1913 Picatinny style rail made of CNC machined 6061 T6 alloy aluminum. It is given a matte black anodized finish. The top of the rail sits as high as the top of the receiver barrel ring. No gunsmithing is required to install the unit. The manganese phosphate coated AISI 4142 molybdenum-chromium alloy steel barrel clamps and recoil lug are secured to the barrel by hex head screws. The entire assembly weighs 10 ounces. When replacing a USGI hand guard, it adds 7 ounces weight to the rifle. Ultimak offered the M8 scope mount beginning in mid-2006.

Viron Tactical - As an accessory to its line of M14 stock models, Viron Tactical produces three barrel rail mounts, SOCOM, Scout and 22 " models. All three models use the M1913 Picatinny rail design and attach at the cartridge clip guide. The difference between the three mounts is the length. The SOCOM model goes forward to just past the front band. The Scout model mount runs up to the front sight on a 18 " long barrel and the 22 " model does likewise for a 22 " long barrel.

**Cleaning Kit**

The M14 is easy to clean even under field conditions. Springfield Armory developed and tested the issue cleaning kit for the M14 from 1958 until 1961, when the final version was fielded. The idea for the USGI cleaning kit was clearly borrowed from the M10 cleaning kit developed in the 1950s for the M1 Garand rifle. The pre-1961 M14 cleaning kit consisted of the following items: a three piece combination tool (handle, wrench head, and plastic cap), separate oiler case and grease cup, chamber brush without or with a ratchet mechanism, four M3 cleaning rod sections, a 3 " swab holder, and a M1 Garand cleaning rod case. The M1 Garand cleaning rod case was developed by early 1958. Before the three piece combination tool was designed, a short 3/8 " box end wrench was included. The prototypes for the final version M14 combination tool and chamber brush had been manufactured by no later than May 1960 but the oiler and grease containers were still separate items. By December 1960, the USGI M14 cleaning kit as we know it today was ready for production.

The 1961 USGI M14 cleaning kit consists of a single piece combination tool, a chamber brush, four M3 cleaning rod sections, bore brush, a 3.5 " swab holder, combination oil and grease lubricant case, a plastic spacer to separate the bore brush and swab holder, and a heavier canvas case for storing the rod sections, bore brush and swab holder. The small chamber of the lubricant case held about 2.5 cubic centimeters of rifle grease. The large chamber was designed to store about 7 cubic centimeters of small arms lubricating oil known as LSA (Lubricant, Small Arms). Most lubricant cases were assembled by the contractor with a gasket for the cap on the large chamber but a few had gaskets for both caps. The USGI M14 lubricant case was marked as follows: top line - LUBRICANT CASE bottom line - 7790995.

By March 1961, Worden Specialty & Machine Tool won the first contract to manufacture the M14 combination tool. During the 1960s and into the early 1970s, there were several more government contracts awarded to produce the combination tool. Chinese M14 rifles sold in the United States and Canada came with a cleaning kit. The Chinese cleaning kit is a close copy of the USGI kit except for the single compartment black plastic lubricant case.

The M1 Garand, M14 and M60 ratchet style chamber brush was designed in 1955 and patented in 1958. The M14 chamber brush is marked 7790463 on the bottom of the ratchet mechanism. M14 chamber brushes produced in 1959 and 1960 had white color ratchet mechanisms. The color of the ratchet mechanism was changed in 1961 to black. Chamber brushes issued in the BII kits, the white color ratchet chamber brushes and Harrington & Richardson subcontractor chamber brushes had a different style pressed-on lock holding the ratchet to the body. It had a machined appearance versus the press stamped look from Hertzberg & Son production after 1965. This same ratchet lock with the machined appearance was used on M1 Garand rifle chamber brushes made in 1963 by USGI contractors in Ohio. The M14 chamber brush was produced by no later than June 1960 for Harrington & Richardson. Either Mill-Rose (OH) or Better Brushes (OH) was probably the subcontractor to Harrington & Richardson for this item. The M14 chamber brush is easily confused with the M1 Garand rifle and M60 machine gun chamber brushes because of their similar size. Unless it is an emergency, those brushes should not be used in the M14 type rifle.

The M14E2 stock does not have a butt stock compartment like the M14 stock, so the M14A1 cleaning kit was placed inside an olive drab water repellent nylon pouch and carried on the web belt or inside the field pack by the automatic rifleman. The M14A1 cleaning kit pouch has a single ALICE clip for attachment to the automatic rifleman's web belt. Fifty test M14E2 cleaning kit pouches were tested by the U. S. Army General Equipment Test Activity from April 04 to August 01, 1966 at Fort Lee (VA). The pouch was recommended for use by the U. S. Army Testing and Evaluation Command on September 19, 1966. Improvements were made to the prototype design and incorporated in the production contracts: heavier weight nylon ties instead of cotton, a double-stitched ALICE clip holder and heavier thread in the seams. The improved (production) design M14E2 cleaning kit was satisfactorily tested to meet the minimum life expectancy of 120 days under combat conditions.

The 1968 contract USGI M14E2 nylon pouch is marked on the inside of the flap as follows from top to bottom: first line – CASE, MAINTENANCE EQUIPMENT second line – SMALL ARMS, M-14E2 third line – DSA 100-68-C-1853 fourth line 0465-926-6768. Most of the cleaning kit pouches from the 1968 contract were sent to the U. S. military in the Republic of Viet Nam. The 1970 contract M14A1 nylon pouch is marked on the inside of the flap as follows from top to bottom: first line – CASE, MAINTENANCE EQUIPMENT second line – SMALL ARMS, M-14-A1 third line DSA 100-70-O-1941 fourth line – 8465-926-6768 fifth line – LADY MAC CORSET CO, INC. The letters US appear on the outside of the pouch flap on both versions.

After 2004, C. J. Weapons Accessories sold an imported reproduction military style butt stock cleaning kit. The case for holding the cleaning rod sections was marked CASE, B098-7267754. Otis Products, Inc. supplies a lightweight and compact cleaning kit for the M14 DMR and M240G machine gun to the U. S. military. The advantage of this cleaning kit design is the ability to clean from the breech to the muzzle end.

In the civilian market, J. Dewey Manufacturing, Co. Inc. (Southbury, CT) makes a single piece nylon coated cleaning rod that helps the owner from scratching the bore. Creedmoor Sports offers a plastic breech block insert that allows bore cleaning while protecting the bolt and firing mechanism. Alternately, the bolt can be locked back while cleaning with an empty magazine inserted into the well or an empty cartridge clip inserted into the receiver stripper guide. To quiet the rattle of the cleaning kit inside the butt stock place three .30 Caliber bore patches through the hex box end of the combination tool then stow it. Wayne Machine Inc. produces reproduction M14 chamber brushes. Sinclair International sells a Dewey Manufacturing M14 chamber brush with a hole drilled through the top ratchet portion. The advantage of this design is that it allows for a two handed pull to remove the brush from the chamber. In 2009, GG&G sold a chamber cleaning tool consisting of a slotted jag attached to a rod with a rubber handle by way of a polyethylene universal joint. The slotted jag was made from 6061 T6 alloy aluminum. The chamber cleaning tool had an overall length of 14.5 ".

**USGI Tools**

An assortment of maintenance tools was made for the USGI M14 rifle. The carrying case for the armorer's kit was a maple wood box with internal cutouts for each tool. The armorer's kit carrying case design was modified in 1962 by adding a storage compartment for the flash suppressor alignment tool. The cost to the military in 1988 for a M14 armorer's field service took kit was approximately $375.00. All USGI M14 flash suppressor nut pliers were made during one production run in 1962. Smith Enterprise, Inc. supplied combination gas cylinder lock front sight wrenches beginning in August 2005 to the U. S. Army, U. S. Navy and U. S. Air Force as a maintenance tool for the Mk 14 variant and M14SE/M21A5 rifles. These wrenches are made of 7075 T6 alloy aluminum-magnesium-zinc. The wrenches are marked as follows: first line – SMITH ENT second line has the Smith Enterprise, Inc. trademark name for the M14SE system and the third line – M14.

The 7.62 mm NATO ruptured cartridge case extractor was an improvement over the .30 Caliber model used for the M1 Garand rifle and the M1919 machine gun. The 7.62 mm NATO model is designed to be pushed out of the barrel chamber using a cleaning rod. The .30 Caliber ruptured cartridge case extractor often had claws broken when used. The 7.62 mm NATO ruptured cartridge case extractor was used for the M1918 series Browning Automatic Rifle, the M1 Garand and M14 rifles, and the M60 machine gun.

The M14 combination tool is very handy. The USGI M14 combination tool is marked: first line - COMBINATION TOOL second line - 7790769. The handle of the combination tool also holds the chamber brush and protects its bristles while stowed in the butt stock. The following tasks can be performed with this tool:

1. Tighten or loosen the gas cylinder plug
2. Tighten or loosen the rear sight knob screws
3. Remove or install the butt plate screws
4. Remove or install the muzzle stabilizer
5. Remove or install the M2 bipod
6. Act as a handle for the cleaning kit rod
7. Disassemble and assemble the bolt
8. Operate the spindle valve
9. Push cartridges from a stripper into the magazine
10. Disengage the connector lock from the operating rod spring guide for disassembly
11. Clean carbon fouling from the gas piston grooves with the screwdriver blade
12. Adjust the height of the VItor Weapon Systems M14 Modstock
13. Tighten or loosen the Troy MCS top rail slide bolt
14. For emergency purposes, tighten or loosen the hex head bolt of the Atlantic Marketing Research Systems, Inc. # 18, Bassett Machine, Sadlak Industries, LLC, Smith Enterprise, Inc. and VItor Weapon Systems CAS-14 scope mounts.

Operator level tools – cleaning kit

Organizational level tools – cotton cleaning patch, fabric envelope, barrel reflector, ruptured cartridge case extractor, flash suppressor alignment tool, flash suppressor nut pliers. A set of nine headspace gauges, sizes 1.630 " to 1.638 ", is authorized as part of the M14 DMR Organizational and Intermediate Maintenance Special Tools and Equipment.

Direct Support level tools – armorer's kit (firing pin protrusion gage, bolt roller retaining ring pliers, gas cylinder piston hole NOT-GO gage, gas piston diameter NOT-GO gage, breechbore field reject gage, FIELD REJECT headspace gage, field test bolt, firing pin hole gage, and wooden case), flash suppressor alignment tool, and 7/64 " hex head L-shaped wrench. The bolt roller retaining ring pliers are marked 762 MM M14 FIELD SERVICE on one handle and 7799723 (A1) US GOVT INSP on the other handle.

Depot Maintenance (General Support) level tools – The Depot kit included: GO, 1.6375 " and NO GO headspace gages, headspace reamer assembly with crank handle, bolt assembly and disassembly tool, barrel and receiver disassembling fixture, firing mechanism assembling fixture, bolt and roller grease fitting adapter, gas port alignment gage, bore straightness gage, targeting jack gage, butt stock holes to butt plate GO gage, and torque testing gage. The bolt assembly and disassembly tool is marked 7791607 M14 M1. When the operating lever is pinned to the hole marked M14, the tool is set for use with the M14 bolt. The U. S. government purchased bore straightness plug gages in 1991 from Greene Metal Products, Inc. (then Harrison Township, MI).

**Commercially Available Tools**

Commercial .308 headspace gauges can be used in lieu of the military 7.62 x 51 mm gauges, but lack of a clearance cut for the ejector requires that the bolt must be disassembled to use them. Throat erosion and muzzle wear gauges are available from Brownells, Inc. and Shooters Den. Stone Axe Engineering 7.62 x 51 mm throat erosion and muzzle wear gauges were made in 2005 and 2006. Twist drill bits (sizes P and 15) can be used by hand to remove carbon buildup inside the gas cylinder plug and gas piston. A 1/16 " hex head wrench is used to remove or install the flash suppressor setscrew. A 7/64 " hex head wrench will fit the front sight screw and Springfield Armory, Inc. Scout Squad forward scope mount screws. USGI early version and some commercial manufacture front sight screws will take a 3/32 " hex head wrench instead. A 3/32 " pin punch is useful in removing the cartridge clip guide pin and the magazine latch pin. To install the selector switch use a 1/16 " pin punch to drive the roll pin out of the selector lock. Wayne Machine Inc. has produced reproduction ruptured cartridge case extractors and flash suppressor nut pliers. The tools necessary to remove and install a barrel are available from Brownells, Inc. Badger Ordnance produces a gas cylinder-to-barrel gas port alignment gage, a stock liner screw wrench, hand guard band pliers and two models of bolt roller greasers. Strobel has produced a bolt disassembly tool that can be used for M1 Carbine, M1 Rifle and M14 Rifle bolts. It was made of aluminum and marked on the side: top line - M1 M14 CARBINE bottom line - STROBEL.

Bondhus produced the Mk 14 EBR combination tool. As supplied to the U. S. military, it was marked MK 14 EBR on each side of the handle. Fulton Armory offers an anodized alloy aluminum gas cylinder lock wrench and the Bondhus Mk 14 EBR combination tool. Sherluk markets a carbon steel gas cylinder lock wrench. Sadlak Industries, LLC manufactures CNC machined alloy aluminum and carbon steel gas cylinder lock wrenches, a scope mount hole thread chase tool and a scope mount hole repair tap. The gas cylinder lock wrench from Smith Enterprise, Inc. is made from hard anodized alloy aluminum and marked SMITH ENT. Commercial reproduction gas cylinder locks are slightly wider than USGI and Chinese gas cylinder locks. Thus, some gas cylinder lock wrenches, as manufactured, will not fit commercial reproduction gas cylinder locks.

**USGI Accessories**

A number of accessories supported the various roles filled by the M14 rifle. These included the M2 bipod, M3 breech shield, M5 winter trigger assembly with or without safety, M6 bayonet, M8A1and M10 scabbards, M12 blank firing attachment, M15 grenade launcher sight, M76 grenade launcher, M151 and M35 vehicle rifle mounting kits, M2 aiming device, M2 bandoleer kit (magazine filler, cartridge clips, cardboard sleeves and canvas carrier), empty chamber indicator, front and rear sight and operating rod protectors, Mk 87 Mod 1 line (rope) throwing kit, sling (M1907 leather, canvas web, hard nylon weave, and soft nylon weave), and a watertight aluminum carrying case for the XM21 ART scope. The winter trigger is marked WINTER TRIGGER M5 on one side and 7790808 on the other. The XM152 winter trigger kit was available for the M14A1.

The Universal Rifle Rack was patented in 1942 to securely stow rifles and submachine guns in jeeps and other military vehicles. It consisted of a spring-loaded long metal bracket contoured to fit any of several U. S. military small arms and a rubber padded cam-locking metal arm. It was in use from World War until the mid-1970s by the U.S. Army and even later by the U. S. Air Force. The design of the Universal Rifle Rack allowed quick retrieval because it was designed for military purposes.

The apparent successor to the Universal Rifle Rack was the M151 vehicle mounting kit. The mounting kit for the M151 vehicle secured the M14 rifle vertically on the front passenger side. The major parts of the kit, butt socket, upper support bracket and spring loaded clamping bar, were coated with plastic to protect the rifle. By 1969, the butt socket was redesigned to fit both M14 and M16 rifles. The mounting kit was also installed on U. S. Army helicopters assigned to combat operations in the Republic of Viet Nam.

The M2 aiming device was made by Weaver Manufacturing, S. I. Howard Glass Co., and a third contractor. Only the Weaver Manufacturing contract aiming devices had a marking, WEAVER B174999.

There were two models of the ART scope and mount carrying case for the XM21/M21. Both versions of the ART scope and mount carrying case were waterproof. The case lids were fitted with a gasket or seal to protect the scope from moisture or immersion. Both versions of the case also had rubber cushions to protect the scope against physical shock. The first carrying case, used during the Viet Nam war, was made of 6061-T6 alloy aluminum and painted olive drab. The first version carrying cases were made by Frankford Arsenal beginning in 1968. It attached to the load bearing equipment belt by use of a single ALICE clip. The second version of the carrying case was made of green color fiberglass and issued with the ART II scopes. The fiberglass carrying case was secured to the user by looping the load bearing belt through the case canvas strap. The AN/PVS-2 carrying case was made of waterproof fiber reinforced neoprene. It had two ALICE belt clips and tie down straps.

Slings - The M1907 leather sling was issued with the M14 M, M14 NM, XM21 and M21 rifles. The M1907 leather slings were marked MRT and some were marked with a date code. MRT stood for Mildew Resistant Treatment meaning the sling had been chemically treated. The USGI M1907 sling was 47.56 " long. The M1907 sling consisted of two leather straps each with a metal hook at one end. The two hooks were made of phosphate coated ASTM A109 steel. M1907 type slings with brass hooks are commercial reproduction units. M14SE system leather slings are marked as follows: first line has the Smith Enterprise, Inc. trademark name for the M14SE system second line – SMITH ENT. third line – M-14 fourth line M-118 LR. A Defense acceptance stamp is centered between the second and third lines.

One USGI contractor for M1907 slings and leather pistol holsters was Cathey Enterprises, Inc. (3423 Milam Drive Brownwood, TX 76081). Cathey Enterprises, Inc. made pistol holsters for the U. S. Army in the 1960s and M1907 slings for the U. S. Army under a 1986 contract. The firm closed its doors about 1998 after thirty years of successful business when its founder, George M. Cathey, retired. His wife, Lila, established Hill Country Leather in January 1999 to carry on the family tradition of producing quality leather firearms accessories. Day-to-day operations for the business are managed by the couple’s daughter, Laurie Perkins. Hill Country Leather has completed several government contracts. The firm manufactures nylon web magazine pouches and web belts and reproduction M1907 slings, M1 Garand cheek rests, and military pattern pistol holsters for the commercial market.

The fabric one piece gun sling was patented in 1944. At the time, there were five requirements for a military rifle sling: 1) parade or close order drill 2) shoulder carry 3) cross-back carry 4) arm loop sling for accurate fire 5) hasty sling for firing. The length of a military gun sling had to be long enough to accommodate the largest soldier carrying the largest pack on his back yet be useful as an arm loop sling for the soldier with the shortest arms. By relying on the hook ends to adjust the sling length, the M1907 sling was not a good fit for the soldier in some situations. The one piece gun sling was an advancement over the M1907 sling in that one end was no longer needed for adjusting the length. The minimum length of the sling was then dictated solely by the length needed for a cross-back carry by the largest soldier carrying the largest pack. The one piece gun sling fabric construction and metalware made it easy and quick to adjust for the user and economical to manufacture.

The M1 Gun Sling was made of canvas web. Some canvas web slings have the same MRT marking as the M1907 sling as well as a month and year date stamp on the metal tip, such as 4 64. The last USGI canvas web slings were made about 1966. It was known as the M1 Gun Sling and weighed 0.3 pounds or about 5 ounces. Subsequent slings, known as Small Arms Sling, have a different National Stock Number and are made of nylon weave material. The hard nylon weave sling was introduced in 1969. The first soft nylon weave sling was produced for the U. S. Navy about 1973.

The hard nylon weave sling had cadmium plated fittings. The soft weave nylon sling had cadmium plated fittings as well until the 1990s. In recent years the soft nylon weave sling has been made with phosphate coated fittings. The M1 Gun and Small Arms Slings have a metal clamp designed to attach to the stock rear sling swivel. The free end is looped through the stock front sling swivel then secured in the sling keeper. The M14E2 sling was made of canvas and longer than the standard small arms sling. It had two clamps instead of one and weighed 0.4 pounds or about 6 ounces. The clamps attached to the M2 bipod sling swivel and the M14E2 hand grip assembly. Chinese M14 rifles sold in the United States and Canada came with a canvas web khaki color sling with gloss black hardware.

Bayonet - The M6 bayonet was used for close combat, guard duty, riot duty, and as a general utility knife. The final production drawing for the M6 is dated January 24, 1955. Thus, the T12 bayonet was developed and adopted as the M6 bayonet even before adoption of the M14 rifle in May 1957. Initially, the decision was made that there would be no bayonet issued for the M14 rifle. So, the M6 bayonet was not produced in significant numbers until 1961. Eventually, 1,633,000 M6 bayonets were delivered to the U. S. Army between July 1961 and February 1969. Aerial Cutlery, Imperial Knife Company, and Columbus Milpar and Manufacturing Company all made M6 bayonets. Imperial Knife made the most M6 bayonets of the three contractors and Aerial Cutlery made the fewest. Columbus Milpar and Manufacturing Company made M6 bayonets in 1962 and possibly later. Imperial Knife Company was the last known contractor for the M6 bayonet with production running as late as 1968. Beware that there are commercial reproduction M6 style bayonets marked AERIAL. A fourth M6 bayonet marking, AN, has been observed but the manufacturer has not been positively identified. Staff Sergeant John Chalker, New York National Guard, carried a M6 bayonet for his M14 rifle while conducting convoy escort duty in February 2005 in Khadimiyah, Iraq.

Out of the packaging, the blade bevel angle on Columbus Milpar and Manufacturing Company M6 bayonets typically requires more stoning to hone the edge than the other two M6 bayonet manufacturers. The bayonet blade material is AISI 1080 high carbon steel and the grip is made of molded plastic. Its weight is 12 ounces. The overall length is 11.51 " with a blade length of 6.75 ". The bayonet is designed to be loose when attached to the M14 rifle in an effort to minimize its effect on the bullet point of impact. The internal parts of the M6 bayonet are interchangeable with the M5 bayonet which is used on the M1 Garand rifle. Lubricate the M6 bayonet with CLP for temperatures down to - 10 degrees Fahrenheit. For temperatures below - 10 degrees Fahrenheit, leave the metal surfaces dry.

Is Your Bayonet Combat Ready? - The U. S. Army maintenance inspection for the M6 and M7 bayonets required soldiers to check the following: 1) handle latches had to snap back when depressed and lock the bayonet securely to the rifle 2) no rust or corrosion allowed on the metal 3) no nicks in the blade edges 4) misalignment between the blade and the handle could not exceed 3/16 " 5) the bayonet hand guard was allowed to be slightly loose.

Scabbard - One manufacturer of the M8A1 scabbard was Victory Plastics Company (Hudson, MA). Victory Plastics produced M8A1 scabbards in 1953 (for the M1 Garand rifle) and in 1961. Its 1961 production scabbards have the metal tip protector while those made in 1953 do not. Victory Plastics went out of business in 1964.

The metal tip protector was added to scabbards made after 1955. The phosphate coating on the 1961 scabbards is lighter gray and more granular than on the 1953 scabbards, and the webbing is a darker green with a lighter sewing thread. Viz Manufacturing had a contract in 1967 to produce M8A1 scabbards. Another contractor was Pennsylvania Working Home for the Blind who made M8A1 scabbards between 1966 and 1968. Scabbards made by Pennsylvania Working Home for the Blind in the 1970s are marked TWB because the business's name was changed to The Working Blind. Eichorn-Solingen in Germany manufactured M8A1 scabbards for the government of Denmark with both British and U. S. compatible belt attachments, although they were never U. S. Government Issue. Eichorn-Solingen M8A1 scabbards did not have the metal tip protector.

The M10 scabbard was issued on a replacement basis for the M8A1 scabbard in the U. S. military by no earlier than 1983. The M10 scabbard can be used with the M5, M6 or M7 bayonets. The M10 scabbard was produced by General Cutlery under U. S. government contract as late as 2002. USGI contract M10 scabbards are black in color. An Imperial Knife M10 scabbard is marked on the back M10 then adjacent to that: top line - 19204 ASSY 8448476 bottom line - MFG 74846. 19204 is the CAGE Code for Rock Island Arsenal. Reproduction M10 scabbards have been made in tan color.

Bandoleer Kits - Each bandoleer kit contained one M2 bandoleer, twelve cartridge clips, six cardboard inserts, one magazine filler and one large safety pin. The M2 bandoleer is made of olive green cotton fabric sewn into six pockets and attached at both ends with a sewn-in carry strap. It will hold twelve cartridge clips, two clips in each of six pockets.

Each pocket has a flap for easy access. Each cartridge clip will hold five rounds of ammunition, for a total of sixty rounds. The cartridge clips were placed two to a cardboard insert inside each of the pockets. The purpose of the cardboard insert was to prevent the ammunition from tearing or cutting the cloth bandoleer during movement such as would occur if a solider was running with a bandoleer slung over his shoulder. The 1974 design four pouch M8 bandoleer for the M16 rifle will hold four M14 twenty round magazines, one in each pocket.

The M14 magazine filler was based on the charger made for the M1 Carbine. There were two versions, the early version was developed in 1958 and the late version was designed in 1961. The late style magazine fillers were marked with the manufacturer's marking on the first line and 7791154 on the second line. The late style also had a reinforcing rib on the rear side. The reinforcing rib allowed the magazine filler to withstand a minimum loading of 45 pounds without breaking or cracking as it pushed downward into the cartridge clip guide. The addition of the reinforcing rib implies the early version magazine filler was not sufficiently robust.

Usually, but not always, U. S. made 7.62 x 51 mm NATO ammunition cartridge clips were stamped with the manufacturer's marking on the rear side. There may be an exception, but as a general rule the U. S. never placed a date code on 7.62 x 51 mm NATO ammunition cartridge clips. Ammunition could be manufactured several years apart from the cartridge clip so there would be no benefit in date coding the cartridge clips. 7.62 x 51 mm NATO ammunition cartridge clips made in the United States have one stop or nib on each side and hold five cartridges. .30 caliber ammunition cartridge clips with two or three nibs on either side were not manufactured in the United States. Australia and all NATO member countries, including the United States, only made five round cartridge clips for 7.62 x 51 mm NATO ammunition.

Five round cartridge clips made in the People's Republic of China were marked MTY 60. These black phosphate coated cartridge clips have been found in ammunition containers of the Chinese made British (RG 60 L2A2 head stamp) marked ammunition exported in the 1980s. Tapco, Inc. (Kennesaw, GA) has imported Chinese made five round cartridge clips, packaged fifty to a box. They had a blued appearance and no manufacturer markings. Both types of Chinese five round cartridge clips have one nib on each side. Ten round cartridge clips have been made in the People's Republic of China for New Century Science & Technology, Inc. (El Monte, CA). The Chinese ten round cartridge clips have two nibs on each side and a medium gray color. They were packed twenty to a retail display package. Cartridge clips made outside of Australia or NATO member countries were sometimes cheaply made as they may have sharp corners and edges and varying dimensions.

Grenade Launcher Sight - The M15 grenade launcher sight was used on the M1903 Springfield and M1 Garand rifles and carried over to the M14. It was designed by John C. Garand and others in 1945. M15 grenade launcher sights were made before 1957 by

Boehm Pressed Steel (Cleveland, OH), Pressure Lube, Inc. (New York, NY), Slaymaker Lock Co. ((Lancaster, PA) and Western Newell Mfg. (Fremont, IL). The M15 sight base was mounted to the M14 stock on the left hand side with two wood screws. The M15 sight could be installed or removed quickly from the sight base by the grenadier. A canvas pouch with M1910 hooks attached to the web belt for carriage of the M15 sight and instruction sheet.

Blank Firing Attachment and Breech Shield - The M12 blank firing attachment (BFA) was issued to the individual soldier for training purposes, along with the M3 breech shield. The M12 BFA is a simple device used to operate the M14 rifle for training purposes without sending bullets down range. It is a metal stem, or orifice tube, that is long enough to enter the barrel a short distance from the muzzle end of the flash suppressor. The orifice tube is hollow so that gunpowder residue and gas from the fired M82 blank cartridge is restricted as it flows out of the barrel. The flow restriction of propellant gas creates enough pressure to fully cycle the bolt. The orifice tube is attached to the rifle by a sheet metal spring that fits over the bayonet lug.

The BFA will function as designed with U. S. made M82 blank cartridges above 0 degrees Fahrenheit. In subzero temperatures, the bolt may not fully cycle resulting in failure to feed or failure to eject stoppages. No other type of ammunition should be used in the rifle with the M12 BFA installed. Care must be taken to prevent use of bulleted cartridges if the BFA is installed. Otherwise, damage to the rifle will occur. The M12 BFA will not cycle the bolt using Canadian and European blank cartridges. Service life of the BFA is dependent upon the rate of fire and the time of cooling allowed. The M12 BFA will last in excess of 5000 rounds at a firing rate of ten rounds (three or four round bursts) per minute with complete cooling every 1000 rounds. More severe firing rates accelerate gas erosion of the rear end of the orifice tube.

The M12 BFA will not cycle the bolt if installed on a rifle with a National Match dimension flash suppressor. Additionally, the M12 BFA tube will not fit all the way into a T44E4 or early M14 flash suppressor. The early M14 flash suppressor, part number 7267088, did not have an inside diameter large enough at the rear end to allow the M12 BFA tube to be fully inserted. Springfield Armory drew up a new flash suppressor design, part number 7791053, in September 1960. The inside diameter shoulder at the rear of the suppressor was done away with to allow use of the M12 BFA with the flash suppressor.

The M3 breech shield was intended to protect the shooter from any blow back particles when firing blank ammunition, and to prevent loading live ammunition through the cartridge clip guide.

There were three versions of the M12 BFA and two versions of the M3 breech shield. The first version BFA was packed with the early style breech shield. These were produced in 1962. The second version blank firing attachments were packed with the early style breech shield in 1964 and the late style breech shield in 1968. The first and second versions were later modified at the General and Direct Support levels by riveting a curved 1/8 " thick piece of steel to the horizontal surface of the spring latch. The steel strap was curved at the front end in order to dissipate gases exiting the muzzle. The M12 BFA modification was implemented with Change 2 to TM 9-1005-223-35 dated February 03, 1970.

The third version of the BFA was made from 1969 to 1973 and packaged with the late style breech shield. Two companies made all the M12 blank firing attachments, East Moline Metal Products Company and Hesse Machine & Mfg. Co. East Moline Metal Products made some M12 blank firing attachments in 1973 at the end of its production that were phosphate coated instead of painted orange and silver.

Line Throwing Kit - The U. S. Navy Mk 87 Mod 0 and Mod 1 kits allow the M14 rifle to reliably launch a nylon cord attached to a butyl rubber projectile up to 90 yards. The projectile will travel 55 yards with the M14 fired horizontal to the surface and 90 yards if shot at an angle of 45 degrees. The launcher is attached to the M14 by a wire loop that is placed around the bayonet lug and secured by the safety retaining pin. Once the projectile with the attached nylon cord has been launched from one ship to another, a line (heavy rope) for underway replenishment chores can be pulled from the first ship to the second. The Mk 87 Mod 1 line throwing kit consists of one launcher, one butt stock recoil pad, six reusable projectiles, eighteen chemical light wands, one wound spool of 550 feet of 125 pound test orange color water repellent nylon cord and an optional canister to hold the spool of nylon cord. The line throwing kit requires the use of M64 grenade cartridges. The butyl rubber projectiles have a stainless steel disk on the rear end to absorb the cartridge propellant gases and wadding. For night time use, an activated chemical light wand is inserted into the butyl rubber projectile. This helps the ship's crew on the receiving end find the front end of the nylon cord after launching.

While not made for the M14 rifle specifically, in the 1960s the U. S. military issued a canvas web Universal Rifle Case. The universal rifle case could hold a scoped rifle such as the M1903A4, the M1C, the M1D, the XM21 or the M21. There were two versions of the rifle case. One version had leather reinforcement points and was marked: first line - UNIVERSAL-RIFLE-CASE second line - D78926. The other version had double thick canvas reinforcement points and was marked: first line - RIFLE CASE, UNIVERSAL second line - ORD. PART NO. 6578296. Both cases had full length stainless steel zippers.

The canvas M1950 individual weapons case was made for Army paratroopers. This case could hold a M1 Garand or M14 rifle. Some M1950 cases were produced in 1968 under a Defense Supply Agency contract. This was a U. S. Army Quartermaster Corps item.

**Commercial Accessories**

Commercial accessories include bipod, brass catchers (canvas and plastic), butt stock recoil pad, dual magazine clamp, elevation sight repair disk, front and rear sight protectors, keyed cable lock, gun cases, magazine loader and unloader, magazine pouches, recoil buffer/reducer, slings (nylon, biothane synthetic and leather), stock comb/ cheek rests and vinyl magazine covers. Reproduction operating rod handle, muzzle and rear sight protectors and the chamber flag have been produced in green and in white. Reproduction (and USGI) operating rod handle, muzzle and rear sight protectors are marked with the appropriate USGI part numbers on them (7790231, 7790232 and 7791358). The green color sight protectors were made overseas. Shooters can purchase dry fire devices in the civilian market for practicing trigger squeeze, shooting position, and competition courses of fire. B.Jones Sights makes a prescription lens insert for the hooded National Match rear sight aperture. Buffer Technologies (Jefferson City, MO) markets a patented recoil buffer for the M14 type rifle. Rubber recoil pads for USGI design M14 stocks have been available from John Masen Company, Hogue, ProMag Industries and Pachmayr.

There are several fabric material rifle stock cheek rests available for the M14 type rifle. The fabric cheek rests are secured by adjustable straps and plastic buckles, hook and pile fasteners or by lacing run through eyelets. Fabric cheek rests come in various colors, black, brown, coyote tan, olive drab green and Army Combat Uniform digital, desert, or woodland camouflage. Suppliers include BlackHawk Products Group, Eagle Industries, Fulton Armory, ITC, Smith Enterprise, Inc. and Stitchery of West Virginia. Charles A. Finn (Oceanside, CA) patented an adjustable cheek rest for long guns that has a pouch for storage of small items. This patented design is one of several rifle cheek pads distributed by BlackHawk Products Group. A cheek rest with the ability to raise the comb height is recommended for M14 type rifles fitted with telescopes and traditional contour stocks. Otherwise, the shooter typically does not achieve proper cheek weld.

Slings - Turner Saddlery and Les Tam M1907 style slings are highly regarded by M14 enthusiasts. The Turner Saddlery biothane M1907 sling is available in a choice of black, dark brown, olive drab green or tan. Les Tam M1907 style slings can be ordered with brass, phosphate coated steel or stainless steel hooks depending on the model. Turner slings are fitted with phosphate coated steel hooks. Both Turner and Les Tam offer their reproduction M1907 slings in longer lengths than the USGI version. High quality tactical and patrol carry nylon slings of various configurations are available for the M14 type rifle from Best Made Designs, L. L. C., Specter Gear or Tactical Intervention Specialists.

maglula, Ltd. (Rosh Ha'ayin, Israel) manufactures a patented magazine loading and unloading device for the M14 and other military small arms. It came to the U. S. market about 2006. The maglula M14 magazine loading device was given a five of five stars rating from Midway USA customers. In 2006, ProMag Industries manufactured a polymer ammunition loading device suitable for M14, AR10 and G3 rifle magazines (product number PM080).

Magazine Pouches – Commercial reproduction ALICE system M14 magazine pouches have been made in black, green and tan colors. Commercial manufacture M14 dual magazine canvas and nylon pouches have been produced since at least 2001 until the present day. M14 magazine pouches made by BlackHawk Products Group, S.O. Tech, Tactical Assault Gear and Tactical Tailor are compatible with the U. S. Army Modular Lightweight Load-carrying Equipment (MOLLE) system of load bearing equipment. The MOLLE load bearing equipment was introduced to the U. S. Armed Forces in 2001. In 2006, Best Made Designs, L. L. C. offered a M14 butt stock magazine pouch. These magazine pouches are very good to excellent quality. These commercial quality magazine pouches are popular with U. S. servicemen in Afghanistan and Iraq.

Adjustable Gas Plugs - Rich Schuster (Toledo, OH) designed and makes Schuster Nuts. These are aftermarket M14 type gas cylinder plugs that can be used in competitive shooting. The top of the plug has a vent hole drilled to 0.015 " diameter. The interior diameter of the plug is larger than the standard M14 gas cylinder plug. This allows the gas pressure to drop about 2600 psi (equivalent to the effect of reducing a cartridge's charge weight by ½ grain of powder). The result is less wear and tear on the rifle through lower initial pressure and less vigorous operation of the gas system. By adjusting a nut inside the plug, the net volume of gas in the cylinder is changed. This in turn changes the speed of the operating rod and the harmonics of the barrel vibrations. M14 gunsmith Clint Fowler (Barboursville, VA) and Derrick Martin (Accuracy Speaks in Mesa, AZ) can supply adjustable gas cylinder plugs for the M14 type rifle. These adjustable gas plugs use socket screws to vary the size of the opening in the top. Thus, the competition shooter can set the amount of gas venting to maximize accuracy and minimize wear.

**M2 Type Bipods**

The M2 bipod design was standardized in December 1959 and improvements were added later. M2 type bipods have been produced in the United States, Taiwan and China. Chinese copies of the M2 bipod do not have as excellent a reputation as compared to the USGI and Taiwanese models.

Taiwan models - The Taiwanese M2 bipod is reliable and suitable for civilian use. It was available commercially as early as 1990. Beginning around 1998, some Taiwanese M2 bipods were sold to the U. S. Navy by Sarco, Inc. (CAGE Code 8R320). Taiwanese M2 bipods are made by Wayne Machine Inc. of Taipei, Taiwan. Early Taiwanese bipods were brazed but failed routinely. The early Wayne Machine, Inc. M2 bipods were marked S. A. BIPOD M2 or BIPOD M2 on the head assembly. Otherwise, Wayne Machine, Inc. M2 bipods were welded together and will hold up to thousands of rounds of automatic fire. Later (welded) Wayne Machine, Inc. bipods were marked BIPOD RIFLE M2 or W M I BIPOD RIFLE M2 on the head assembly. Taiwanese late version M2 bipods sold by Sarco to the U. S. Navy do not have the W M I mark.

A few Taiwanese M2 bipods were installed on M14 rifles and used in combat in Afghanistan in 2005. Seven of these bipods were removed from combat service in July 2005 because each suffered the loss of the retaining pin holding the spring and button in one of the leg folding pushbutton assemblies.

Chinese models - The Chinese M2 bipod was marketed by Norinco beginning in 2003. The Chinese version was marked W M I BIPOD RIFLE M2 on the head assembly similar to the copy made by Wayne Machine, Inc. If the locking bolt accepts a hex head wrench less than 3/8 " size, it is a Chinese bipod.

ProMag Industries - As of 2007, ProMag Industries was producing its own M2 bipod (catalog number PM019). It was made from high carbon steel and marked PM BIPOD RIFLE M2.

USGI models - USGI M2 bipod parts were made of carbon or alloy steel depending on what the drawing specified for the part. A USGI M2 bipod will likely be of brazed construction for the most part. The leg shoes or pads were always arc welded to the bottom of the leg extensions. When deployed, the leg shoes act as skids when the rifle is moved laterally. The furnace brazed joints on the leg shafts had to withstand an applied tensile load of 2,000 pounds without separating. Similarly, the head assembly brazed joints were tested with a load of 3,500 pounds. Alternately, the head assembly plates could be arc welded to the leg assemblies. The welds and the jaws were examined for defects by the wet process magnetic particle inspection method.

A phosphate coating was applied to all surfaces of the bipod. USGI M2 bipods left the factory with a yellow DOD acceptance stamp and three blue letter M markings, one on the bottom of each leg pad and one on the outside of the right hand jaw. The blue letter M signified satisfactory results from non-destructive examination. The yellow DOD acceptance stamp was applied to either the front or the rear head assembly plate. The yellow and blue markings tended to wear off with use in the field and are rarely seen on bipods found today. An American made USGI contract M2 bipod will have the following markings on the head assembly: U. S. 7790688 BIPOD RIFLE M2 or U. S. 7790833 BIPOD RIFLE M2.

The USGI contract manufacture M2 bipod was initially produced without a sling swivel. The sling swivel was added to the M2 bipod by no later than 1962 for testing of the M14 (USAIB). This modified M2 bipod was made part of the M14 (USAIB) Technical Data Package in September 1963. It carried over to the M14E2 (later M14A1) Rifle. M2 bipods were later manufactured with a sling swivel. Sling swivels were also added to M2 bipods while in service through a Modification Work Order or a Direct Support level field modification. M2 bipods with swivels will have a longer pin to secure the swivel to the head assembly. Some early USGI M2 bipod locking bolts do not have a screwdriver slot. The M2 bipod was revised in February 1967 to add a small screw and nut to the top of each leg extension. In March and April 1967, the bipod jaw drawings were revised for improved grip.

**Other Bipods**

In 1979, Rock Island Armory (Geneseo, IL) produced and sold a reproduction T44 Type II bipod (referred to as a Type I bipod in other references). The item was marketed as BIPOD, M1. This bipod attached to the bayonet lug of any M1 Garand or M14 type rifle. Reportedly, 200 of the BIPOD, M1 units were made. They retailed for $42.00 each.

GG&G and Harris bipods are typically mounted to the rifle's stock just aft of the front sling swivel. A hole is drilled in the stock to which an adapter is fitted and secured. The stock forearm may or may not be reinforced per the owner's preference. Alternately, some rifle owners use the 5/16 " diameter drain hole located 1 " behind the stock ferrule. Either way, this method of attachment avoids changes in point of impact that may occur with the M2 bipod. These bipods are also lighter than the USGI M2 bipod.

The 5/16 " diameter drain (not vent) hole behind the stock ferrule is an acceptable location to mount a bipod. According to M14 gunsmith Ted Brown [minor spelling and punctuation errors corrected]:

> Actually, the hole is not meant to bleed off gas from the gas cylinder. All of the gas is blown back on to the stock and vents between the stock and hand guard. The hole is primarily designed to drain water from the stock. Of course, it comes out everywhere else too. The hole is a reasonably good place to mount a Harris bipod. One must keep in mind that it is not the strongest part of the stock, but it does work.

The Keng's Firearms Specialty M14 bipod is a Chinese copy of the Parker-Hale precision rifle bipod. Its bipod mounting adapter for the M14 type rifle is catalog number 150-102. This bipod mounting adapter replaces the American threaded gas cylinder plug to allow a Keng's Firearms Specialty bipod to be mounted to the rifle. This mounting adapter will not work on Chinese manufactured M14 gas cylinders because of the different thread pitch. A Keng's Firearms Specialty M14 bipod can also attach to a standard quick detachable sling swivel with its universal mounting adapter (catalog number 150-100). In 2005, the firm introduced a 3 3/8 " long MIL-STD-1913 Picatinny rail that attaches to the bottom of the M14 stock just forward of the front sling swivel (catalog number 150-807). This steel M14 stock MIL-STD-1913 Picatinny rail section requires no stock modifications to be installed. The KFS rail section has a channel machined on the top surface to allow gas from the gas cylinder to vent out of the stock. The KFS rail section includes a 1 5/8 " wide freely rotating sling swivel.

The Mk 14 Mod 0 bipod was developed by Keng's Firearms Specialty and Mike Rock. This bipod had a patent pending quick detach clamp that attached to the bottom Picatinny rail of stocks so equipped such as the J. Allen Enterprises JAE-100, Sage International

M14 EBR, Troy Industries MCS, and McMillan MFS-14 models. The Mk 14 Mod 0 bipod legs were adjustable in six increments for a height of 9 " to 12 " when unfolded from the stock. The patented claw-like design of the bipod feet kept them from sinking into wet or sandy soil. The bipod (catalog number RD-923) had pan and tilt movement to allow target tracking and axial rotation to correct for uneven ground.

Troy Industries offered a bipod for the Rock SOPMOD M14. It mounted to the six o'clock rail on the stock and had a quick release mounting lever.

**Ammunition**

Headspace - USGI, Chinese and Taiwanese M14 type rifles are chambered for the 7.62 x 51 mm NATO cartridge. Chinese M14 rifles from the factory are headspaced long. The majority of Federal Ordnance M14 type rifles were assembled with Chinese barrels and bolts or sold as bare receivers. U. S. commercial manufacturers typically headspace M14 type rifles to Sporting Arms and Ammunition Manufacturers' Institute (SAAMI) specifications for .308 Winchester unless chambered for another caliber. However, some U. S. commercial M14 type rifles built by armorers and gunsmiths for competition were headspaced for 7.62x51 mm NATO ammunition. Therefore, the buyer should check the headspace when purchasing a rifle unless the factory or gunsmith supplies the headspace reading at the time of purchase. If the headspace is from 1.630 " to 1.634 ", then either commercial manufacture .308 Winchester or military manufacture 7.62 x 51 mm NATO ammunition can be used. The subject of hand-loaded ammunition in the M14 type rifle is beyond the scope of this work.

If a USGI M14 rifle bolt closed on a USGI FIELD REJECT gage with a FIELD TEST bolt (part number 7274799) installed, the rifle was removed from service and the receiver and barrel declared unserviceable. If the FIELD TEST bolt would not close on the FIELD REJECT gage but the issue bolt did then the bolt was removed from service and replaced. The USGI M14 headspace gage sizes were as follows: 1.6355 " GO, 1.6375 ", 1.6415 " NO GO and 1.6445 " FIELD REJECT.

**Table 33: M14 Type Rifle Headspace Dimensions**

| Reference | GO (inches) | NO GO (inches) | FIELD REJECT (inches) |
|---|---|---|---|
| SAAMI | 1.630 | 1.634 | 1.638 |
| Drawing F7267000 Rifle, 7.62 MM, M14 Revision AH dated January 24, 1986 | 1.6355 | 1.6405 | |
| Drawing F7790476 Rifle, 7.62 MM, M14 NM Revision D dated April 10, 1969 | 1.6355 | 1.6385 | |

| | | | |
|---|---|---|---|
| 1967 National Match Rifles - U. S. Army Materiel Command | 1.6355 | 1.6385 | |
| AMU M14 MTU-NM Manual | 1.631 | 1.635 | |
| National Guard MTU Accurizing the M14 Service Rifle | 1.632 | 1.636 | |
| SA-SIP-7790476 | 1.6355 | 1.6385 | |
| MIL-R-45979 dated 24 Sep 76 Military Specification M14 NM | 1.6355 | 1.6385 | |
| TI-02648A-25/10B November 1972 | 1.630 | 1.638 | |
| TM 9-1005-223-34 August 1971 and TM 9-1005-223-35 July 1968 | | | 1.6455 |
| DMWR 9-1005-223 October 1971 | 1.6355 | 1.6415 allowed maximum, 1.6375 desired maximum | |
| TM 02648C-24&P/2 July 2000 | 1.632 | 1.638 | |

Ammunition Variety and Suppliers - The U. S. government (Frankford Arsenal, Lake City, Twin Cities and Winchester) has produced 7.62 x 51 mm NATO ammunition as follows:

**Table 34: 7.62x51 mm NATO Ammunition Cartridges**

| Cartridge | Description |
|---|---|
| M59 Ball | 150.5 grain mild steel core bullet with lead tip and base all contained inside a gilding metal jacket, produced about 1959 and 1960 only, also made by Remington Arms Company, Inc. |
| M60 High Pressure Test | 171.5 grain bullet with tin coated case |
| M61 Armor Piercing | 150.5 grain boat tail steel core bullet with black tip |
| M62 Tracer | 142 grain bullet with orange tip, traces out to 800 meters |

| | |
|---|---|
| M62 Tracer Overhead Fire Mission | 146 grain bullet with red tip |
| M63 Dummy | case has six longitudinal flutes, no primer |
| M64 Grenade | rosette crimped case mouth, original drawing dated July 1955, first produced by Lake City in 1962 |
| M80 Ball | 146 grain lead-antimony core bullet, original drawing dated January 1962 |
| M80 Ball Overhead Fire Mission | 149 grain bullet |
| M82 Blank | double tapered neck, front portion replicates loaded cartridge length for reliable feeding |
| M118 Match | 172 grain bullet headstamped MATCH or NM, no NATO circle-cross, primer not crimped to enable marksmanship units to easily reload training ammunition, adopted by 1966 |
| M118 Special Ball | 172 grain bullet usually headstamped L C and the last two years of manufacture at ten, two, four and eight o'clock for each character, no NATO circle-cross |
| M118LR | 175 grain hollow point boat tail bullet |
| M160 Frangible Ball | 108.5 grain lead and phenolic resin bullet with green and white tip or green tip with white primer annulus |
| M172 Dummy | 149 grain bullet with black oxide finish case that has no primer or primer vent hole |
| XM178 Ball Overhead Fire Mission | bullet made of bronze to prevent fragmentation |
| M192 Blank | rosette crimped case mouth with red wad or purple lacquer |
| XM192E1 | lightweight ball with white tip |
| M198 Duplex Ball | two copper plated AISI 1112 steel core bullets |
| XM256E1 | low recoil steel core copper jacketed bullet with white tip<br><br>This cartridge was developed and tested by Frankford Arsenal in 1975. This bullet is physically the same as the M198 cartridge upper bullet. Bullet weight is 80 to 84 grains. |
| M276 Dim (Night Vision) Tracer | 140 to 150 grain bullet with violet tip after 09/94, green tip with pink primer annulus before 10/94 |

| | |
|---|---|
| M852 Match | 168 grain hollow point boat tail bullet headstamped MATCH, case body knurled about ½ " from the head, primer not crimped |
| M948 Saboted Light Armor Penetrating (SLAP) | tungsten bullet in an amber plastic sabot |
| M959 SLAP Tracer | M196 5.56 mm tracer bullet in a plastic sabot |
| M973 Training Ball | fluted bullet |
| M974 Training Tracer | fluted bullet with red tip |
| M993 Armor Piercing | 126.6 grain bullet with black stripe at the tip |

Frankford Arsenal was founded on May 27, 1816 and was located in what is now northeast Philadelphia, PA. It was an ammunition research, development and production facility throughout its history. During World War II, as many as 22,000 personnel were employed at the arsenal. Frankford Arsenal produced small arms ammunition as late as 1965, e.g., M198 cartridges. Frankford Arsenal developed some experimental small arms lubricants that tested favorably under arctic conditions from November 1966 to January 1967. The experimental lubricants were tested on M14 rifles and other small arms. In 1968, Frankford Arsenal was part of the U. S. Army Materiel Command with 5,714 workers. Frankford Arsenal closed in 1977. The 112 acre property was eventually sold by the U. S. government and is now an industrial park.

Lake City Army Ammunition Plant (Independence, MO) was established in 1940 to produce small arms ammunition for the U. S. Army. Lake City manufactured M852 Match ammunition was introduced in 1980 for military competition shooters. This cartridge was first classified as XM852 in 1981 and then M852 later in the same year. It provided better performance than the M118 Match cartridge at distances out to 600 yards. Lake City remains in operation today as part of the U. S. Army Industrial Operations Command. The Industrial Operations Command is a subordinate command of the U. S. Army Materiel Command.

U. S. military 7.62 mm NATO ammunition was packaged in linked belts, cartridge clips inside bandoleers or inside cardboard cartons. Linked cartridges were used for belt fed machine guns, obviously. For the M14 Rifle, the ammunition was packed in cardboard cartons or bandoleer kits. M62 tracer, M80 ball, M82 blanks and M198 duplex rounds were packed in bandoleer kits, sixty cartridges to a kit. M62, M80, M82, M118, M172, and M198 cartridges were packed in cardboard cartons of twenty cartridges each. Due to the expense, ammunition packaged in bandoleer kits was issued for combat use only.

7.62 mm NATO ammunition delivers a substantial punch to hard targets. M80 ball ammunition is able to penetrate the barriers listed below:

Pine (0.75 " thick) - 17 boards at 100 meters, 9 boards at 600 meters
Sandbags - 11 " at 200 meters, 5 inches at 600 meters
Steel (14 gauge) - 3 plates at 500 meters
Concrete (building block with one center rib) - both sides at 400 meters

Subsonic ammunition was hand loaded at Fort Benning, GA for XM21 sound suppressed rifles in the Republic of Viet Nam. This subsonic round was designed to be stable for a distance of 100 meters or less. Placing the spindle valve in the “OFF” position reduces the muzzle velocity by only 15 feet per second using M118 Match ammunition but it does noticeably intensify felt recoil. Likewise, removal of the flash suppressor does not significantly alter bullet muzzle velocity. Match grade ammunition has been in use by competition shooters since the 1921 National Matches.

The effective range of M198 duplex ammunition was less than 150 meters. This cartridge was developed by Winchester-Western and standardized on May 07, 1964. The front bullet has a light green tip and hollow base and the rear bullet has a slanted base. The front projectile weighs 84 grains and the rear projectile weighs 85 grains. Accuracy for the front bullet is 2 " mean radius at 100 yards. Dispersion for the rear bullet was 5 " to 10 " at 100 yards. In testing conducted by the U. S. Army Infantry Board in 1961, 7.62x51 mm duplex ammunition was 14 to 22 % more effective in hitting personnel type targets in simulated infantry squad combat conditions.

In the spring of 1971, the U. S. Army tested the effectiveness of using M62 tracer in daylight conditions. One hundred soldiers from the 197th Infantry Brigade at Fort Benning, GA participated in the test. The soldiers were given refresher marksmanship training and allowed to obtain battle zero settings for their M14 rifles. The test was conducted with soldiers firing both M62 tracer and M80 ball ammunition at a total of twelve stationary Army E type silhouette targets painted yellow. The targets were placed at three distances, 100 meters, 300 meters and 500 meters. The soldiers were divided into three groups, each firing ball ammunition but using a different technique to engage the targets with tracer rounds. All rounds were fired in semi-automatic mode with only one soldier firing the course at a time. The soldiers were only able to detect the tracer rounds moving toward the target about 23 % of the time. Overall, the probability of making a hit on target in the same amount of time was about the same, 44.4 % for ball and 45.2 % for tracer. None of the techniques employed in firing tracer rounds proved to be significantly better or worse than the others. The M14 rifle is better suited for night firing of M62 tracer ammunition over the M14A1. The M14E2 muzzle stabilizer produces enough flash signature with M62 ammunition to affect the operator’s night vision.

A M62 tracer projectile usually ignites 35 to 70 meters forward of the muzzle. It will be fully lit before reaching a distance of 100 meters down range. The tracer projectile will burn out between 800 and 900 meters away from the rifle. Tracer ammunition serves a number of purposes: 1) an individual shooter can adjust fire on a single target 2) target designation 3) target illumination 4) signalling to others 5) supervision of a unit’s firing 6) signal to the shooter that it is time to reload 7) incendiary effect 8) aid in range estimation and 9) psychological effect on the enemy.

Surplus military ammunition can be of high quality. Ron Smith (Smith Enterprise, Inc.) was a member of the Arizona and California National Guard Shooting Teams. He reports that his scores were from 490 to 495 in High Power Shooting competitions (fifty shot National Match Course) with match grade ammunition. Using surplus Portuguese military ammunition, his scores ranged from 485 to 490!

Commercial ammunition in .308 Winchester is available in varying bullet weights of full metal jacket, soft point and hollow point. Black Hills, Federal, Remington, and Winchester all produce high quality ammunition. Springfield Armory, Inc. does not recommend the use of soft point ammunition in the M1A rifle. Use of soft point cartridges can cause build up of lead deposits in the chamber. Dirty barrel chambers will cause excessive pressure which may result in serious personal injury. The M14 type rifle can be loaded using magazines or cartridge clips. Some scope mounts prohibit loading the rifle with cartridge clips.

Semi-automatic fire is more accurate on point targets but automatic fire has a greater incapacitating effect on enemy troops due to greater volume and rate of fire. On the other hand, ammunition supplies deplete much more rapidly with automatic fire. A unit's rate of fire is proportional to its fire superiority and inversely proportional to its sustainability. Carry more ammunition and mobility is reduced and logistics support is increased. The cartridge, the rifle, and the combat load will always be a compromise solution for any infantry unit.

One of the criticisms of the M14 is its full size rifle cartridge. During the 1960s, the proponents of small caliber high velocity cartridges within the U. S. Department of Defense argued that more rounds could be carried by the infantryman and logistically more rounds could be packaged and transported for the same weight over the 7.62 mm NATO cartridge. That is very true. Unfortunately, the troops did not realize much of a reduction in the load bearing equipment burden.

The M14 and M16 series rifles use essentially the same small arms sling and the butt stock cleaning kits have approximately the same weight. The M14 rifle with a full twenty round magazine minus the sling and cleaning kit weighs 10.3 pounds. Add 6.0 pounds for another four fully charged magazines for a total of 16.3 pounds. 100 rounds of 7.62 mm NATO ammunition was the M14 rifle basic issue load of ammunition for combat.

The M16A1 Rifle was further developed and improved due to issues discussed in other references. The result was classified as the M16A2 in 1982 and first adopted by the U. S. Marine Corps in 1983. The M16A2 Rifle weighs 8.8 pounds with a full thirty round cartridge but without the sling and butt stock cleaning kit. From at least 1976 onward, the basic issue of ammunition for the M16A1 and M16A2 has been 210 rounds of 5.56 mm

NATO. The other six fully loaded M16 magazines weigh 5.4 pounds. This gives a total weight of 14.2 pounds for the M16A2 rifle and its basic ammunition load. A M14 rifle with five fully charged magazines but no cleaning kit or sling weighs 16.3 pounds. An additional six M14 magazines would provide an equivalent number of cartridges as compared to the M16 ammunition load at a cost of an additional 9.0 pounds. The physical bulk of two M14 magazine pouches is about the same as two M16 magazine pouches. Though 5.56 mm NATO ammunition weigh less, the weight advantage is partially offset by the increased bulk of any additional M16 magazines. From the 1960s onward, additional ammunition was carried in bandoleers for those carrying either M14 or M16 variant as the needs of the mission dictated.

The combat load of a soldier consists of his weapon, ammunition, clothing, water, food rations, and equipment. It is the equipment necessary to put the infantry soldier into battle and sustain him for immediate combat operations. In other words, it's what will sustain the soldier for up to 72 hours in combat. The basic issue of ammunition for the M14 rifle in the 1960s, 100 rounds, was sufficient for an average day of combat based on data tables developed from combat experience up to that time.

In 1961, the U. S. Army infantry soldier wore 35.9 pounds of clothing and equipment (boots, bayonet and scabbard, load bearing equipment, uniform, first aid kit, gas mask, two grenades, helmet, entrenching tool, pack, water, poncho, flak jacket, toiletries and rations). Adding the M14 rifle, five full magazines, and two magazine pouches increased the total combat load to 50.7 pounds for the U. S. Army infantry rifleman. In 1961, the U. S. Army Infantry School recommended a maximum combat load of 45 pounds.

By 1992, the U. S. soldier was much more burdened. The U. S. Army combat load consisted of a fighting load (helmet, water, gas mask, bayonet and scabbard, load bearing equipment, grenades, first aid kit, and gas mask), minus the M16A2 and ammunition, of 20.7 pounds, and an approach march load (pack, rations, more water, toiletries, towel, entrenching tool, poncho and poncho liner) of 22.1 pounds. The U. S. Army position was that the total combat load should remain less than 60 pounds but the Army failed to account for the weight of clothing, boots and the body armor, about 15 to 17 pounds, which really are a part of the combat load. Thus, a 1990s soldier would carry about 72 pounds of clothing, equipment, weapon, ammunition, rations and water. The soldier's physical strength, ease of movement and responsiveness decrease as the combat load increases.

Going forward from the 1960s to the 1990s, the soldier's combat load increased by more than 20 pounds even with a reduction of 2.1 pounds for the rifle and issue load of ammunition. Worse yet, a 2003 study by the U. S. Army Center for Army Lessons Learned found that the average combat load (fighting load plus approach march load) was 95.7 pounds for 82$^{nd}$ Airborne Division riflemen conducting dismounted operations in Afghanistan. Just the fighting load itself averaged 63 pounds for the rifleman on foot in Afghanistan. As of early 2009, the U. S. Army and U. S. Marine Corps was experiencing an increasing number of non-deployable troops due to acute orthopedic injuries. For the U. S. Army, this number was about 20,000 at the time. These injuries were caused from repeated combat tours in Afghanistan and Iraq which required soldiers and Marines to carry heavy individual equipment loads. Changing to a more flexible "as needed" individual equipment list and/or adopting newer design commercial off-the-shelf (COTS) load bearing equipment would provide much greater benefit to the warfighter at much less time and cost. Since the First Gulf War, the U. S. military has adopted some of the COTS load bearing equipment, e.g., hydration bladders with nylon fabric carriers.

With the exception of special operations units, combat and combat support troops will generally receive regular resupply. Not that one wants to run out of ammunition in a firefight but the supply train should ensure adequate resupply for the "trigger pullers." In other words, if the logistics and transportation components of the armed services do their job, the individual grunt doesn't need to carry 500 rounds of rifle ammunition at all times. After all, military operations are a team effort.

**Other Calibers**

After then-Secretary of Defense Robert McNamara announced the cancellation of M14 rifle production in 1963, TRW attempted a conversion of the M14 to .223 Remington in an effort to save what it could of its investment with the M14 Rifle. This conversion was performed by TRW employee John Dodds. It included adding a longer extractor, changing the bolt face to fit the smaller cartridge, modifying the magazine latch and M16 magazine follower, and installing a M14 contoured .224 caliber barrel and a filler block for the rear of the magazine well. The barrel was machined at TRW from a Douglas supplied barrel blank. This unique TRW rifle was demonstrated to the military but the project went no further.

In 1992, Armscorp USA made at least one receiver stamped 5.56 MM M14 NM. It was made to the same dimensions as the 7.62 x 51 mm receiver and no modifications were made. Gene Barnett made a 5.56 mm 1:12 twist M14 barrel for the receiver. The bolt face and extractor were modified for the smaller 5.56 mm cartridge case. This rifle uses a twenty round M16 magazine that is riveted inside a M14 magazine tube.

In the late 1970s and early 1980s Karl Maunz converted about 100 M1 Garand rifles to a number of experimental calibers such as 6.5 mm, 7 mm, .45 ACP and “wildcat” calibers .451 through .459. Through the 1960s, 1970s and 1980s, Karl Maunz drew up drawings for these wildcat cartridges and sent them to Clymer Manufacturing Company (Rochester Hills, MI) to have chamber reamers made. This included manufacture of a .308 Winchester caliber headspacing chamber reamer in 1963 for the M1 Garand rifle. Karl Maunz obtained the wildcat caliber barrels from Jack Krieger and Bob Hart after Clymer Manufacturing Company had supplied the Maunz designed chamber reamers. Clymer Manufacturing Company was established in 1958 by Max and Tina Cramer. In 2005, Karl Maunz was developing a .45 ACP cartridge for the M1 Garand and M14 type rifles.

Karl Maunz came up with the idea of mating a 6.5 mm 140 grain bullet to a 7.62 x 51 mm cartridge case. He named this cartridge the .630 Maunz. As a matter of personal preference, he used Frankford Arsenal match cartridge cases over Lake City match cartridge cases. Karl Maunz came up with .630 Maunz design after looking at the .276 cartridge that had been originally developed for the M1 Garand rifle. It proved to be an exceptionally flat shooter at 600 yards. He did some development work in 1964 on a muzzle-feeding chamber reamer. This chamber reamer was intended for use in the .308 Winchester barrel M1 Garand rifle. This preliminary work was done while he was still in the Army Reserve. He was able to finish the design and manufacture of the original .630 Maunz muzzle-feeding headspacing chamber reamer in 1965. Later, the use of .308 Winchester cartridge cases mated to smaller bullets was made available in the Maunz Match Rifle Model 87. The Model 87 was available in the following calibers: 7.62 x 51 mm / .308 Winchester, .308 case with .224 bullet, .308 case with .244 bullet, .308 case with .264 bullet or .308 case with .284 bullet.

Springfield Armory, Inc. offered M1A rifles chambered in .243 Winchester from at least 1978 until at least 1990 and in .358 Winchester from 1978 to 1980. Barrel blanks in .22, 6 mm, .25, .270, 7 mm, .30 and .35 caliber were offered from 1978 to 1980. Springfield Armory, Inc. would install one of their barrels into a M1A rifle during this period for a nominal charge, $10.00 to $14.00. From 1991 and later, the M1A was available in 7mm-08. These M1A rifles were sold in the United States and in countries where civilians were prohibited from owning military compatible ammunition. For example, Super Match M1A serial number 088619 was custom built in 1995 by Springfield Armory, Inc. It had a Hart 7mm-08 heavyweight barrel and the receiver was rear lugged. Armscorp M14 NM serial number 12148 was built with a .243 Winchester 18 " barrel long but it is not known if the barrel was installed by Armscorp USA. M1A rifles exported to Spain are chambered for .307 Winchester.

Arizona Expert Arms (Mesa, AZ) and Dow Arms Room (Dade City, FL) can convert M14 type rifles to .300 Winchester Short Magnum upon customer request. The Arizona Expert Arms conversion includes installation of a custom Krieger heavyweight barrel, machining the bolt face and extractor, drilling the proper size barrel gas port, and relieving the stock to accommodate the barrel. Standard USGI M14 twenty round magazines will hold and feed eleven .300 WSM cartridges without modification.

About 2004, Mr. Dow converted two Springfield Armory, Inc. M1A rifles to .300 Winchester Short Magnum caliber M21 type configuration. The conversion work included installation of Smith Enterprise, Inc. scope mounts. The two rifles were delivered to McDill Air Force Base by Charles Moore, a night vision supplier to McDill Air Force Base (AFB) or some resident command therein. The M1A rifles were to be tested at McDill AFB. The rifles were supplied with a quantity of hand loaded ammunition (175 grain SMK projectiles). There were no follow on orders. At least of one of the .300 WSM caliber M1A rifles was tested in Iraq by a member of the U. S. military. The individual was pleased with the performance of the system. Mr. Dow's conversion includes modifying the extractor, installing a heavyweight barrel with a reduced gas port diameter, enlarging the barrel chamber, opening the bolt face, installing a proprietary design ejector assembly and removing up to an 1/8 " of material from the scope mount bottom surface.

Mr. Roland Beaver of Old Corps Weaponry, a M14 gunsmith, has built several commercial M14 trainer rifles in .22 LR caliber using Sturm, Ruger & Company, Inc. 10/22 rifle receivers. Mr. Beaver adds a .22 LR caliber chambered barrel, a custom carved walnut stock and hand guard and M14 gas cylinder, flash suppressor and front sight to create a custom made M14 training rifle. He made both prototype and production models of his M14 trainer.

The M14 Rifle is credited with being the inspiration for the Sturm, Ruger & Company, Inc. Mini-14 Rifle. Ruger employee L. James Sullivan began work on the Mini-14 project in 1967. After several modifications were made to the original design, the Mini-14 was made available to the public and law enforcement agencies in 1974. The .223 Remington caliber Mini-14 receiver is machined from an investment casting.

**M14 Problems**

After government production began, the M14 rifle experienced occasional failures where the bolt did not strip the next round from the magazine and so closed on an empty chamber. Sometimes, the bolt would contact the cartridge halfway through the cycle causing a jam. This occurred because the bolt speed increased with using ball-shaped gunpowder while the M14 rifle had been originally designed to use ammunition loaded with extruded gunpowder. Springfield Armory redesigned the magazine spring to help raise the rear end of the follower and shortened the rear end of the cylindrical portion of the operating rod by 0.1 ". The shortening of the operating rod increased the bolt cycle time to give the magazine spring sufficient time to raise the top cartridge to where it needed to be. These changes were successful in eliminating the cartridge stripping problem.

In the early 1960s, U. S. Marines used the M14 rifles with fixed bayonets for Close Quarters Battle training. When Marines executed the movement known as the vertical slash, the stock would sometimes disengage from the front band causing the barrel to separate from the stock. Also, a similar problem occurred when the Marines used the M14 rifle as a step to hurdle over obstacles. Two Marines would hold the rifle, one at either end while a third Marine stepped on to the rifle in the middle to clear a fence or wall. To keep the stock from separating from the barrel under such combat conditions, the gas cylinder was redesigned to incorporate a lip just aft of the bottom gas port to support the front band.

In close quarters combat, shorter and lighter carbines are faster to get on target than longer and heavier rifles. But with practice, the time difference can be shortened to a fraction of a second longer with the heavier weapon. The NATO Research & Technology Organization found that a soldier equipped with a 8.3 pound C7A2 (M16 style) rifle could turn with his rifle shouldered from face front to ninety degrees to the side in 1.69 seconds. The same soldier with a more heavily accessorized C7A2 rifle weighing 13.5 pounds could make the same maneuver in 1.78 seconds.

The most common failures of the M14 rifles while in service were cracked stocks and rear sight pinions, missing rear sight nuts, and misaligned flash suppressors. Less common failures were broken safeties, broken firing pins, and out of specification gas cylinders. The least common problems were broken hammer hooks or spurs, extractors and bolt locks. Few, if any, problems were reported with the operating rod, firing mechanism (except safety), butt plate, or front sight itself. The early version 3/32 " socket front sight screw was often stripped and could not be removed. The late version 7/64 " socket front sight screw was issued to alleviate this problem. Repeated automatic fire from the hip with the M14E2 stock will cause it to crack at or near the top of the pistol grip.

The U. S. Army anticipated a certain amount of parts failures. TM 9-1005-223-35 July 1968 Section II Repair Parts List indicated the maximum number of repair parts allowed in inventory per 100 rifles at the following maintenance levels: Direct Support thirty day supply, General Support thirty day supply, one year contingency and Depot Support. Many M14 and accessories parts were only authorized two spares per 100 pieces supported at the Direct Support and General Support levels. Aside from small pins, the front sight screw (76) and the firing pin (48) were the parts with the highest authorized quantity for Depot Support.

During arctic testing of small arms lubricants from November 1966 to January 1967 by the U. S. Army, nine firing pins, two operating rod springs, three sears, three ejectors and one bolt were replaced among ten M14 rifles that were fired for a total of 73,105 rounds. Recorded temperatures during these parts failures ranged from a high of - 10 degrees Fahrenheit to a low of - 55 degrees Fahrenheit.

There were two versions of the M14 extractor. The early version was designed by John C. Garand and patented in 1940. The early extractor was identical to the M1 Garand rifle extractor and had a sharp point on the lower front right-hand corner which could snag the cartridge. This caused the extractor to leave the bolt when firing M82 blank cartridges. This problem was corrected with the late version (drawing changed in March 1963) extractor. The late version extractor was milled with a beveled lower front corner which allowed the M82 cartridge to clear the extractor. The early version extractor is unacceptable for overhaul of USGI M14 rifles.

By 2005, if not before, some USGI XM21 and M21 rifles sometimes had developed very long headspace. Over the years, the bolts had been lapped too many times by various military armorers as the rifles were overhauled or rebarreled. One of these rifles had a bolt that closed on a military Field Reject headspace gage with a short chambered barrel that was to be installed. Other XM21 and M21 rifles were found to just meet headspace requirements with a short chambered barrel. These rifles have no equipment maintenance history logs to keep track of such data. A maintenance log that is faithfully kept up is not a bad idea for any piece of important equipment, the M14 included.

No projectile weighing over 168 grains should be used in an unmodified M14 type rifle with standard barrel chamber. [1] This is because of increased chamber and gas port pressure generated with heavier bullets. Thunderbird Cartridge Company (Laveen, AZ) tested some M118 ammunition for Smith Enterprise in 1990. The chamber pressure measured from 53,000 to over 59,000 cupric units of pressure (CUP). The adjusted average chamber pressure was 57,000 cupric units of pressure at 78 degrees Fahrenheit. Shooting a steady diet of 180 grain cartridges has bent the operating rod on a Norinco M14 Sporter. U. S. Army M14 rifles in Iraq in 2004 were experiencing overpressure problems with M118LR 175 grain ammunition. An M14 rifle may safely shoot M118LR ammunition if the barrel chamber is reamed to the M118LR chamber dimensions. At the time of this writing, Smith Enterprise, Inc. is the only firm with a M118LR cartridge chamber reamer. The M118LR reamer is made only for Smith Enterprise, Inc. by Dave Manson Precision Reamers (Grand Blanc, MI). Dave Manson started Dave Manson Precision Reamers in 1999 after having worked at Clymer Manufacturing Company for sixteen years as Production Manager.

Ammunition must NEVER be loaded by hand into the chamber with the bolt allowed to close at full speed driven by the operating rod spring. That practice presents the risk of slam fire. Ammunition should instead be fed only from the magazine. The receiver bridge should prevent this from occurring but it is not wise to rely on it. For added protection against a slam fire condition caused by a forgetful operator and a worn receiver bridge, gunsmith Roland Beaver has installed a firing pin spring in the bolt assembly for M14 type rifles he has built. Always point all firearms in a safe direction and always assume a loaded chamber for safety reasons. The M14 operating rod handle can be quickly and easily tapped forward in a combat situation should the bolt fail to lock after chambering a cartridge.

The user should not attempt to engage the safety on an M14 type rifle unless the hammer is cocked. Otherwise, the safety can fail. The M14 safety was designed to prevent it from being engaged with the hammer uncocked. The feature avoids failure to cock the hammer due to interference from the safety. Manipulating the M14 safety creates an audible sound. In a tactical situation, audible sound may not be desireable to the rifle operator. Other components of the firing mechanism are remarkably trouble-free and durable, so long as amateurish “trigger jobs” are avoided.

Based on civilian experience, USGI gas pistons have a useful life between 10,000 and 15,000 rounds. USGI gas cylinders will require replacement after approximately 40,000 rounds. If the gas system is never cleaned and the rifle is fired for thousands and thousands of rounds the operating rod will eventually break based on experience with Australian government wildlife agency shooters. Flash suppressor prongs experience signs of gas erosion near the muzzle after thousands of rounds fired. The prongs will eventually crack at some point after 15,000 rounds.

Some Viet Nam War veterans have stated that the M14 magazine feed lips could and did bend when hitting the deck hard in a combat situation. While this is a true statement, it is not unique to the M14 rifle. This is a concern with other magazine fed military rifles as well.

Some M14 type rifles left the factory with loose flash suppressors and operating rod guides. The flash suppressor nut can be over-tightened causing slight stretching of the barrel. This was an issue with XM21 and M21 rifles. The gas cylinder plug can and has loosened during firing and in combat at that. The prepared M14 type rifle owner always carries a M14 combination tool to check the gas cylinder plug on a routine basis. Once these parts are correctly installed, the M14 rifle is almost always trouble free. Every 1000 rounds, the M14E2 muzzle stabilizer should be removed from the rifle and cleaned of baked on carbon residue. If the bolt does not cycle after the first shot is fired, check the spindle valve to see if it is in the open position (slot in the vertical). The wise M14 type rifle owner carries a spare complete bolt assembly already headspaced and fitted to the rifle.

There are sixty elevation serrations on the M14 type receiver. Consequently, each click of the elevation knob raises or lowers the sight aperture by one minute of elevation angle or 0.008 " vertically. A few M1A receivers between serial numbers 007000 and 020000 tend to wear prematurely on the elevation serrations. These receivers can be heat treated and the surface hardness increased to correct this condition. As an alternate solution, the receiver serrations counterbored and covered with a hardened steel elevation serration repair disc by firms such as Smith Enterprise, Inc. This disc was developed by Fort Benning USAMTU armorers. It has 120 serrations on one side and sixty serrations on the other side. The disc can also be used to obtain half-minute elevation adjustments with a standard rear sight aperture. In 1973, the elevation serration repair disc was manufactured by Liberty Tool & Die Corporation (Rochester, NY). The disc has been available through Fulton Armory and Smith Enterprise, Inc. The design of the standard windage knob detents prevents similar problems on that side of the receivers.

There have been cases where commercial manufacture extractors have flown out of the bolt while the rifle is cycling. These extractors can usually be made serviceable by further machining of the divot where the extractor spring plunger rests on the extractor, or by replacing the extractor spring plunger. An alternate solution is to replace the commercially-made extractor with a USGI extractor. Often, the commercial extractor spring tension is insufficient, the extractor spring detent is too large or the extractor stem is too long. The hole to house the extractor spring was not always drilled sufficiently in commercial manufacture bolts. An unissued USGI M1/M14 extractor spring was required to be 0.480 " long and have twelve right-hand coils. It would not be a bad idea to check the length and count the coils of a replacement extractor spring before installation. If the commercial bolt hole is too shallow to accept a USGI extractor spring, consult a reputable M14 gunsmith.

Extended bolt locks may require some gunsmithing work to install on commercial receivers. This is because the bolt lock window dimensions or location or the receiver left side exterior surface above the bolt lock window may not exactly match the requirements of USGI drawing F7790189. So, the extended bolt lock may require modification to fit on a commercial M14 type receiver.

Chinese M14 type gas cylinders and gas cylinder plugs are prone to rusting because they are not made of stainless steel. Chromium plating on the Chinese gas pistons makes rust less of a problem with that part. The USGI M14 rifle, like other small arms, was susceptible to surface rust from the jungle environment in the Republic of Viet Nam. Modern firearms preservatives can alleviate this condition for the M14 in humid climates. The canvas M1956 ammunition cases (magazine pouches) shrank from being soaked with rain in southeast Asia. This made it difficult to remove M14 magazines from the pouches. Conversely, U. S. troops in the Republic of Viet Nam found that the wood M14 stock could swell from exposure to heavy rain to the point that the rifle could not be reassembled without drying out the stock.

From late 2001 when M14 rifles were fielded with the 82$^{nd}$ Airborne Division until the present day operations in Afghanistan and Iraq, the U. S. Army suffers from a dearth of armorer expertise to maintain the M14 rifle in combat theaters at the Direct Support and General Support maintenance levels. Nonetheless, the M14 rifle has proven itself over and over in combat with even less-than-adequate support.

Regarding the full traditional battle rifle silhouette, the M14 can be fitted with a telescoping butt stock, 18 " barrel and a shorter, updated design flash suppressor for end users operating in such environments. Installation of an 18 " barrel alone would reduce its overall length to approximately 39.3 ". In comparison, the M16A2 rifle is 39 5/8 " long.

**1987 Springfield Armory, Inc. Recall Notice**

Springfield Armory, Inc. issued a recall of specific bolts and safeties in 1987. Some Springfield Armory, Inc. M1A, M1 Garand and BM59 rifle firing mechanism safeties could be disengaged by pulling on the trigger with a heavier than normal amount of force. These rifles would not fire after the trigger was pulled the first time but would fire after the trigger was released and pulled again with a normal amount of force. After unloading the rifle of all ammunition and pointing the muzzle in a safe direction, the firing mechanism should be tested as follows: 1) cycle the bolt 2) place the safety in the off position 3) place the safety in the on position 4) pull the trigger with more than a normal amount force then release it. Perform this test several times. If there is any forward movement (disengagement) of the safety, the firing mechanism should be removed from the rifle and Springfield Armory, Inc. contacted.

The 1987 recall applies to M1A bolts with these markings: 1) no numerical or alphabetical characteristics on either the top or back of the bolt (completely unmarked) 2) any bolt with any numerical or alphabetical markings at all on the back of the bolt 3) any bolt with the top marked 7790185 and with SA RRR centered below that number or 4) any bolt with the top marked 7790185 and with SA centered below that number. If the reader has such a bolt, contact the Customer Service Department at Springfield Armory, Inc. Politely discuss your situation with the Customer Service Representative. Springfield Armory, Inc. still honors this recall if applicable to the part concerned. The bolts subject to recall were found to have incorrect locking lug angles. The RRR marking stood for Reese Reese Reese.

**Accurizing Tips**

A competent gunsmith can enhance the accuracy of an M14 type rifle. Some of the procedures the gunsmith may perform include: checking the operating rod spring guide for parallel, padding the hand guard, gluing or pinning the gas spindle valve open, measuring the operating rod spring for proper length, unitizing the gas cylinder to the front band, shimming the gas cylinder to the barrel to correct gas cylinder lock timing, peening or knurling the barrel to ensure interference fit of the gas cylinder, operating guide, and flash suppressor, tuning the firing mechanism, backing off the flash suppressor setscrew, reaming the flash suppressor, polishing the gas piston, hand fitting various parts, installing National Match front and rear sights, bedding the stock, modifying the stock liner, and lapping the bolt. Springfield Armory developed the concept of bedding military rifle stocks in the early 1880s. Stock bedding of match rifles was done as early as 1903. Some match shooters will file down the height of the front sight blade so as to get the 100 yard zero of the sights to be zero clicks of elevation from bottom. Beware of this modification if a used M14 type rifle is purchased. It will become obvious during the sighting in procedure if its National Match aperture is replaced with a standard peep aperture. The rifle will then shoot high above the point of aim unless the front sight is also replaced.

The single best modification for accurizing the M14 is to unitize the gas system. U. S. Army M14 match armorers used the more labor intensive method of screwing the gas cylinder to the front band to unitize the gas system. Before the spindle valve can be drilled and tapped, it and the front band must be annealed. The spindle valve is heated to 1300 degrees Fahrenheit then allowed to slowly cool for twelve hours. The front band is spot annealed with a torch. Stainless steel screws are then screwed into the front band and spindle valve with epoxy adhesive applied to the threads. Finally, the screws are staked to the front band to keep them from loosening. A special jig is used to keep all the parts aligned while this is accomplished. U. S. Marine Corps M14 match armorers unitized the gas system by silver soldering the gas cylinder to the front band. This method is much less time consuming. Either method achieves the desired result.

As a general rule, U. S. Army MTU armorers modified the following M14 parts: flash suppressor, front band, gas cylinder, gas piston, hammer, operating rod, operating rod spring guide, sear, and stock. Some shooters have a National Match front sling swivel installed on their stock. The USGI riveted front sling swivel is removed and replaced with a quick detach sling swivel that is mounted to the stock with bolts and nuts. This increases the strength of the swivel attachment and allows the shooter to wrap his arm into a tighter sling when shooting.

Stock bedding can be accomplished without traditional bedding materials. Newer stock designs offered by Sage International, Ltd., Troy Industries, Inc. and J. Allen Enterprises, Inc. use tension bedding that never wears out. Smith Enterprise, Inc. modifies USGI synthetic stocks so that there is downward pressure on the front band. In either case, accuracy is enhanced by eliminating movement between the stock and the barrel.

**Miscellaneous Tips**

Maintenance - Civilian M14 type rifle owners may not have the benefit of a Marine Corps Drill Instructor to coach and mentor them. Hence, it is up to you to take the initiative to perform operator level preventive maintenance on the M14 type rifles and other firearms you own.

What is firearms preventive maintenance? U. S. Army manual DTM 9-1005-221-10 defines preventive maintenance as the "systematic care, inspection, and servicing of equipment to keep it in serviceable condition, prevent break downs and assure maximum operational readiness." Consult the Original Equipment Manufacturer (OEM) owner manuals for specific procedures for firearms other than the M14. This volume lists several military and commercial publications detailing preventive maintenance procedures for the M14 rifle. Along with the appropriate manuals, possessing and knowing how to use the basic cleaning kit items for each firearm is a must for every civilian owner.

The items performed in the order listed below form a good general inspection check list for the M14 type rifle:

1) Clean the chamber and bore and lubricate the rifle.

2) Check the gas cylinder plug is snug while the rifle is at ambient temperature. Do not overtighten the gas cylinder plug.

3) **With the chamber clear, no magazine inserted into the rifle and the muzzle pointed in a safe direction**, cycle the bolt by pulling the operating rod to the rear then letting it go. There should be no binding of the bolt or operating rod.

4) Engage the safety to check its operation.

5) Operate the windage and elevation knobs to check operation. Move the knobs back to the established zero of the rifle.

6) Check the front sight to make sure it is not loose.

7) The sling should be in good repair.

8) Magazines should be clean, dry and not deformed.

The M14 extractor can be removed from the bolt with the rifle still assembled. Pull the operating rod handle rearward and lock the bolt. Place an empty .30-06 cartridge case inside the barrel chamber. Gently ride the bolt forward until it stops. The empty .30-06 cartridge case will keep the ejector and ejector spring depressed. This facilitates removal or installation of the extractor without use of the M14 combination tool.

When removing the firing mechanism (first check that the rifle is clear of ammunition, cycle the bolt, and engage the safety) keep fingers out of the inside of the trigger guard when pulling the trigger guard away from the stock to avoid injury. Instead, use a thin metal object and place the end into the hole on the rear end of the trigger guard and pull out and away from the stock. If a screw driver or the M14 combination tool is not available, the rim of an empty cartridge case can be used to tighten the elevation knob screw. To begin disassembly of the firing mechanism, place the hammer in the “as fired” position before removing the trigger pin.

When cleaning the inside of the receiver, lower a cartridge clip through the cartridge clip guide to a point below the bolt face. This will keep the bolt from going into battery and causing injury. Removing the sling keeper from the sling and then looping the sling through the rear sling swivel will reduce noise from the sling while carrying the rifle.

Write down sight adjustments for various ranges and points of impact for different cartridges on a small piece of paper. Tape this note sheet to the inside surface of the butt plate flapper. Brass marks on the operating rod are created by ejected cartridge cases. This is perfectly normal for the M14 type rifle. When firing the rifle, the shooter may notice one or two "ping" sounds. When dry firing, this noise is produced by the hammer. When firing live ammunition, the sounds are caused by the hammer and the flash suppressor. Again, this is perfectly normal for the M14 type rifle.

The M14 type rifle should not be cleaned or lubricated too much but neither should its care be ignored. Service conditions and the level of match conditioning should drive the preventive maintenance regimen for each M14 type rifle. Appropriate, not excessive, preventive maintenance facilitates excellent rifle performance. A USGI M14 rifle using M80 ball ammunition will have a 250 meter sight zero at 4.6 centimeters above the point of aim at 25 meters.

Storage - For long term storage, several weeks or more, the U. S. Army and National Guard Marksmanship Units recommend storing match conditioned (bedded stock) M14 type rifles muzzle down with the trigger guards unlatched and hung from the rear sling swivel. This keeps the weight of the barreled action off the stock bedding. Otherwise, M14 type rifles may be stored with the muzzle up.

**Your Relationship with M14 Gunsmiths and Firearms Dealers**

The following suggestions will enhance your experience with these professionals if you adhere to them: 1) keep a written detailed journal of problems with your firearm 2) do not whine 3) listen before you speak 4) be willing to learn 5) be patient 6) accept the fact that quality service is never the least expensive 7) submit clear and complete written information describing the problem(s) or work to be done in the same package with your insured and unloaded firearm 8) be polite 9) educate yourself on your firearm and 10) the original equipment manufacturer should be contacted first if possible.

The following is a partial list of gunsmiths with experience working on M14 type rifles. No particular business is being endorsed. They are listed alphabetically. If a web site or e-mail address is not listed, consult telephone directories for contact information.

Arrington, Phil Scottsdale, AZ www.arringtonaccuracy.com Phil specializes in M1 Garand, M14 type and semiautomatic M16 style rifles. Phil has had a lifelong interest in shooting, hunting, and handloading. He has been building M14 type rifles since at least 1997.

Brown, Ted Shooters Den Jacksonville, OR www.tedbrownrifles.com Ted retired as a Master Sergeant from the U. S. Air Force and Air National Guard. He has been a team member, armorer and coach for National Guard shooting teams and successfully coached Junior Rifle Teams for several years. He earned the U. S. Air Force Distinguished Rifleman Badge (# 214) and Master Class designation in 1988. He has built National Match M14 type rifles since 1978. Ted specializes in M1 Garand and Carbine, M14 type and semiautomatic M16 style rifles.

Corcoran, Ken North Pole, AK 907-488-3258. Ken has been working on M14 type rifles since the late 1970s. He served over twenty years in the U. S. Army. He was an AMU armorer and served over twenty years in the U. S. Army. He has built match winning M14 rifles for competition shooters and battle ready M14 rifles for troops deploying to Iraq in the Second Gulf War.

Dow, Bruce R. Dow Arms Room Dade City, FL www.tacticalrifles.net Bruce was a competitive pistol and high power rifle shooter. In the 1980s, he was a member of the New Hampshire State Rifle Team for five years at Camp Perry. He earned shooting awards with his Super Match M1A rifle. He has been a gunsmith since the 1960s and a source of knowledge for books on firearms and court cases involving firearms.

Evan's Gunsmithing and Shooter's World Orange, CA www.egsw.com/home.htm Featured in *American Survival Guide* and *Gun World*.

Ferrante, David Heart Mountain Precision Powell, WY Dave is a High Master shooter with the M14 type rifle as well as a highly reputable M14 gunsmith.

Fowler, Clint Barboursville, VA www.m1-m1a-ar15.com Clint earned his Distinguished Rifleman badge in 1964. He has set several national shooting records and won four Camp Perry Nathan Hale Trophies and numerous shooting medals and state championships. Clint has been a gunsmith since the early 1980s specializing in the M1Garand, M14 type and semiautomatic M16 style rifles.

Luhmann, Tom T.L.C. Gunworks Clovis, CA

Martin, Derrick Accuracy Speaks, Inc. After serving and shooting competitively in the U. S. Marine Corps, Derrick enrolled and graduated from the gunsmithing program at Trinidad (CO) Junior College in 1980. He worked for Safari Arms, Smith Enterprise, Inc. and retail gun shops in Arizona and Nevada. He went on to become a Distinguished Rifleman in 1987, a President's 100 shooter in 1988, and Distinguished Pistol Shot in 1996 as a member of the Arizona National Guard. He has authored two books on competitive shooting and contributed to Precision Shooting. Derrick and his wife Cheryl founded Accuracy Speaks, Inc. in 1989.

McKee, Clint Fulton Armory Savage, MD www.fulton-armory.com See section on Fulton Armory. Clint also works on M1 Garand and semiautomatic M16 style rifles.

Morris, Ronnie Match Service Works Madison, TN

Pierce, Eric National Match Armory Rendon, TX

Smith, Ron Smith Enterprise, Inc. Tempe, AZ www.smithenterprise.com

Strait, Tim Warbirds Custom Guns Houston, TX http://www.warbirdscustomguns.com Tim has more than twenty-five years experience as a military armorer and commercial gunsmith specializing in Mauser, M1 Garand, and M14 type rifles and M1911 pistols. His experience includes performing M1A receiver warranty work during the 1980s for Springfield Armory, Inc. Tim has performed hundreds of USGI bolt conversions on Chinese M14 receivers.

Tabor, Frank Tabor's Shooters Supply San Bruno, CA www.taborshooters.com

Tank, Jon Tank's Rifle Shop Fremont, NE www.tanksrifleshop.com Jon specializes in M1 Garand and Carbine, M14 type, and M16 style rifles and Remington shotguns.

**Part 3 Notes**

1. Smith, Ron.  Personal discussion.  February 18, 2004.

# Appendix A

**Serial Number Data for the Commercial M14**

A M14 type rifle collector will often ask when his rifle was made. The information below was gathered in an attempt to help M14 type rifle owners answer that question. Use of the letter “X” in the serial number denotes that the specific digit was not revealed by the owner. In all cases, the serial number and month and year information was obtained from either the original FFL or the owner by way of a factory shipping tag, original purchase receipt or journal notes or by contacting the manufacturer. In the tables below, "purchased" means the month and year the original retail buyer paid for the receiver or rifle and "delivered" means the month and year the original FFL received the rifle or receiver from the manufacturer. The term "shipped" refers to the month and year the receiver or rifle was shipped from the manufacturer to the original FFL. Unless otherwise noted, each serial number was shipped as a complete rifle from the manufacturer to the best knowledge of the author.

**Table 35: Springfield Armory, Inc.**

| Receiver Serial Number | Month and Year | Comments |
|---|---|---|
| 000065 | 12/71 | sold as a receiver |
| 000172 | 04/72 | sold as a barreled receiver |
| 000214 | 04/72 | sold as a barreled receiver |
| 000567 | 12/72 | |
| 000708 | 02/73 | |
| 001695 | 12/73 | |
| 001727 | 01/74 | sold as a receiver |
| 001977 | 04/74 | |
| 001988 | 04/74 | sold as a barreled receiver |
| 002127 | 04/74 | sold as a barreled receiver |
| 002167 | 09/74 | sold as a barreled receiver |
| 002168 | 09/74 | sold as a barreled receiver |
| 002282 | 09/74 | sold as a barreled receiver |
| 002283 | 09/74 | sold as a barreled receiver |
| 002284 | 09/74 | sold as a barreled receiver |
| 002293 | 09/74 | sold as a barreled receiver |

| | | |
|---|---|---|
| 002709 | 11/74 | sold as a receiver, lowest known Illinois serial number |
| 002734 | 04/75 | sold as a rifle, Illinois |
| 002770 | 07/75 | sold as a rifle, Illinois |
| 002774 | 11/74 | sold as a receiver, Illinois |
| 002808 | 11/74 | sold as a receiver, Illinois |
| 002831 | 02/75 | sold as a rifle, Texas marked barrel |
| 002867 | 05/74 | sold as a rifle, Texas |
| 002874 | 05/74 | sold as a rifle, Texas |
| 002923 | 11/74 | sold as a receiver, Illinois |
| 002979 | 11/74 | sold as a receiver, Illinois |
| 002985 | 12/74 | sold as a receiver |
| 002990 | 10/74 | sold as a barreled receiver, Texas |
| 002992 | 10/74 | sold as a barreled receiver, Texas |
| 002995 | 10/74 | sold as a barreled receiver, Texas |
| 002996 | 10/74 | sold as a barreled receiver, Texas |
| 002998 | 10/74 | sold as a barreled receiver, Texas |
| 003109 | 10/74 | sold as a barreled receiver, Texas |
| 003124 | 10/74 | sold as a receiver, Texas |
| 003129 | 10/74 | sold as a barreled receiver, Texas |
| 003139 | 10/74 | sold as a barreled receiver, Texas |
| 003140 | 10/74 | sold as a barreled receiver, Texas |
| 003142 | 10/74 | sold as a receiver, Texas |

| | | |
|---|---|---|
| 003159 | 10/74 | sold as a receiver, Texas |
| 003210 | 10/74 | sold as a receiver, Texas |
| 003217 | 10/74 | sold as a receiver, Texas |
| 003270 | 11/74 | sold as a receiver, Illinois |
| 003306 | 10/74 | sold as a receiver, Texas |
| 003322 | 01/75 | sold as a receiver |
| 0034XX | 01/75 | sold as a barreled receiver |
| 00356X | 04/75 | verified with Springfield Armory, Inc. Customer Service |
| 003719 | 09/75 | verified with Springfield Armory, Inc. Customer Service |
| 004340 | 11/75 | verified with Springfield Armory, Inc. Customer Service |
| 004357 | 12/75 | |
| 004379 | 04/76 | sold as a receiver |
| 0066XX | 10/76 | sold as a receiver |
| 007297 | 06/77 | |
| 007600 | 09/77 | |
| 008977 | 10/78 | |
| 009334 | 02/79 | |
| 009586 | 10/78 | sold as a receiver |
| 009690 | 05/78 | |
| 0108XX | 08/79 | |
| 0125XX | 02/80 | |
| 013000 | 10/74 | sold as a barreled action, highest Texas serial number, stamped out of sequence |
| 013195 | 05/80 | |
| 013308 | 05/80 | |

| | | |
|---|---|---|
| 013853 | 06/80 | |
| 014095 | 06/80 | sold as a receiver |
| 014233 | 07/80 | |
| 014619 | 08/80 | |
| 014806 | 09/80 | |
| 015516 | 10/80 | |
| 017912 | 05/81 | sold as a receiver |
| 018096 | 06/81 | |
| 018483 | 06/81 | |
| 019598 | 09/81 | subsequent legal conversion to select fire |
| 020528 | 11/81 | |
| 020676 | 11/81 | |
| 021075 | 02/82 | |
| 021499 | 03/82 | sold as a select fire model |
| 021941 | 04/82 | |
| 022186 | 06/82 | |
| 022482 | 07/82 | |
| 024095 | 12/82 | |
| 024740 | 03/83 | |
| 025939 | 07/83 | |
| 028260 | 11/83 | |
| 028342 | 12/83 | |
| 029284 | 02/84 | |
| 029390 | 03/84 | |
| 030036 | 04/84 | |
| 030061 | 05/84 | sold as a select fire model |
| 030310 | 05/84 | sold as a receiver |
| 031359 | 01/85 | sold as a receiver |
| 031892 | 11/84 | |
| 032315 | 11/84 | sold as a receiver |

| | | |
|---|---|---|
| 032672 | 01/85 | |
| 032951 | 12/84 | sold as a receiver |
| 033283 | 02/85 | |
| 033847 | 03/85 | |
| 034299 | 05/85 | |
| 034651 | 06/85 | |
| 035037 | 09/85 | sold as a receiver |
| 036600 | 12/85 | sold as a barreled receiver |
| 036945 | 12/85 | |
| 037343 | 11/86 | |
| 037405 | 01/86 | sold as a barreled receiver |
| 037830 | 02/86 | sold as a receiver |
| 038607 | 04/86 | sold as a select fire model |
| 039619 | 12/86 | |
| 040555 | 03/87 | |
| 041005 | 03/87 | sold as a receiver |
| 041509 | 06/87 | |
| 043208 | 10/87 | |
| 045083 | 05/88 | |
| 045336 | 09/88 | sold as a receiver |
| 045377 | 05/88 | sold as a receiver |
| 045515 | 07/88 | |
| 045911 | 06/88 | |
| 046069 | 09/88 | sold as a Super Match M1A with Shaw Combat stock |
| 046254 | 10/88 | |
| 047122 | 12/88 | |
| 047824 | 03/89 | |
| 050000 | 12/89 | |
| 050073 | 07/89 | |

| | | |
|---|---|---|
| 050233 | 07/89 | |
| 050438 | 07/89 | |
| 050885 | 09/89 | |
| 051753 | 10/89 | |
| 052122 | 11/89 | |
| 052724 | 12/89 | |
| 053079 | 12/89 | |
| 053096 | 12/89 | |
| 053554 | 01/90 | |
| 053623 | 01/90 | |
| 053815 | 01/90 | |
| 054507 | 03/90 | |
| 054999 | 02/90 | |
| 055258 | 03/90 | |
| 055298 | 04/90 | |
| 055491 | 05/90 | |
| 057106 | 05/90 | |
| 058009 | 06/90 | |
| 059194 | 08/90 | |
| 059761 | 09/90 | |
| 060736 | 10/90 | sold as a receiver |
| 060887 | 11/90 | |
| 060890 | 10/90 | |
| 061026 | 11/90 | |
| 061320 | 10/90 | |
| 061388 | 11/90 | |
| 062340 | 01/91 | |
| 062380 | 01/91 | |
| 062672 | 09/91 | |
| 062680 | 08/91 | |

| | | |
|---|---|---|
| 0630XX | 03/91 | |
| 0635XX | 03/91 | |
| 0640XX | 05/91 | |
| 064872 | 11/91 | sold as a rear lugged Super Match rifle |
| 064880 | 12/91 | sold as a rear lugged receiver |
| 065323 | 10/91 | |
| 066290 | 10/91 | sold as a folding stock M1A-A1 model |
| 066425 | 10/91 | sold as a receiver |
| 067852 | 12/91 | |
| 066871 | 10/91 | sold as a receiver |
| 068177 | 01/92 | |
| 068540 | 03/92 | |
| 068978 | 04/92 | sold as a receiver |
| 069101 | 04/92 | sold as a receiver |
| 069457 | 05/92 | |
| 069860 | 07/92 | |
| 070005 | 07/92 | |
| 072074 | 03/93 | |
| 072253 | 05/93 | |
| 072562 | 04/93 | sold as a receiver |
| 072680 | 05/93 | |
| 073468 | 07/93 | |
| 075704 | 11/93 | |
| 075874 | 12/93 | |
| 076322 | 01/94 | |
| 076392 | 01/94 | |
| 077987 | 02/94 | |
| 078191 | 04/94 | |

| | | |
|---|---|---|
| 078206 | 04/94 | |
| 078839 | 03/94 | |
| 079085 | 03/94 | |
| 079266 | 04/94 | |
| 079836 | 04/94 | |
| 079844 | 04/94 | |
| 080377 | 05/94 | |
| 081435 | 06/94 | |
| 081586 | 07/94 | sold as a rear lugged receiver |
| 082619 | 07/94 | |
| 082817 | 08/94 | |
| 084469 | 09/94 | sold as a receiver |
| 084627 | 09/94 | |
| 084859 | 09/94 | sold as a receiver |
| 08493X | 10/94 | sold as a receiver |
| 085735 | 09/94 | |
| 085992 | 11/94 | |
| 087166 | 02/95 | |
| 088936 | 03/95 | |
| 089693 | 03/95 | |
| 090354 | 03/95 | |
| 092371 | 07/95 | |
| 092426 | 06/95 | sold as a M1A-A1 model |
| 094058 | 01/96 | |
| 094551 | 01/96 | |
| 095137 | 02/96 | |
| 096025 | 03/96 | |
| 097333 | 05/96 | |
| 097345 | 08/96 | |
| 098053 | 10/96 | |

| | | |
|---|---|---|
| 098991 | 11/96 | |
| 100222 | 02/97 | |
| 101285 | 03/97 | |
| 101718 | 04/97 | |
| 101945 | 05/97 | |
| 102570 | 05/97 | |
| 103355 | 06/97 | |
| 104850 | 08/97 | |
| 106880 | 10/97 | |
| 107826 | 11/97 | |
| 108873 | 01/98 | |
| 109159 | 02/98 | |
| 109770 | 03/98 | sold as a rear lugged M21 |
| 110125 | 03/98 | |
| 110129 | 03/98 | |
| 110232 | 03/98 | |
| 110583 | 04/98 | |
| 111434 | 05/98 | |
| 113667 | 11/98 | |
| 114084 | 01/99 | |
| 114614 | 12/98 | |
| 115296 | 02/99 | |
| 116733 | 04/99 | |
| 117268 | 04/99 | |
| 117369 | 06/99 | sold as a barreled receiver |
| 118284 | 06/99 | |
| 118401 | 08/99 | |
| 118861 | 07/99 | |
| 120709 | 09/99 | |
| 121590 | 11/99 | |

| | | |
|---|---|---|
| 122961 | 12/99 | |
| 123035 | 12/99 | |
| 124046 | 01/00 | sold as a barreled receiver |
| 124132 | 01/00 | |
| 124998 | 02/00 | |
| 125899 | 03/00 | |
| 126057 | 03/00 | |
| 126142 | 03/00 | |
| 126461 | 04/00 | |
| 127335 | 04/00 | |
| 128222 | 06/00 | |
| 129313 | 07/00 | |
| 130055 | 10/00 | |
| 130724 | 12/00 | sold as a rear lugged Super Match rifle |
| 130974 | 12/00 | |
| 131290 | 12/00 | |
| 131585 | 11/00 | |
| 132810 | 03/01 | |
| 133405 | 05/01 | |
| 133605 | 03/01 | |
| 133665 | 03/01 | |
| 134855 | 07/01 | |
| 135551 | 08/01 | |
| 136425 | 10/01 | |
| 136732 | 10/01 | |
| 137075 | 11/01 | |
| 137432 | 11/01 | |
| 137546 | 11/01 | sold as a receiver |
| 137777 | 11/01 | |

| | | |
|---|---|---|
| 139240 | 01/02 | |
| 139401 | 01/02 | |
| 139488 | 01/02 | |
| 139506 | 01/02 | |
| 140898 | 03/02 | |
| 141455 | 03/02 | |
| 141575 | 03/02 | |
| 142118 | 04/02 | |
| 142243 | 04/02 | |
| 143123 | 05/02 | |
| 143583 | 05/02 | |
| 144107 | 06/02 | |
| 144200 | 06/02 | |
| 144278 | 06/02 | |
| 144836 | 06/02 | |
| 144999 | 06/02 | |
| 145288 | 07/02 | |
| 146246 | 08/02 | |
| 147042 | 09/02 | |
| 148064 | 11/02 | |
| 148380 | 10/02 | |
| 148639 | 10/02 | |
| 148934 | 10/02 | |
| 148998 | 11/02 | |
| 149004 | 11/02 | |
| 149063 | 10/02 | |
| 149645 | 12/02 | |
| 150156 | 12/02 | sold as a receiver |
| 150506 | 12/02 | sold as a receiver |

| | | |
|---|---|---|
| 150555 | 12/02 | sold as a receiver |
| 150648 | 12/02 | |
| 150686 | 12/02 | |
| 151496 | 01/03 | |
| 151600 | 01/03 | |
| 151707 | 01/03 | |
| 152377 | 02/03 | |
| 152451 | 02/03 | |
| 152750 | 04/03 | |
| 153789 | 04/03 | |
| 152956 | 03/03 | |
| 155359 | 04/03 | |
| 155865 | 04/03 | |
| 156121 | 05/03 | |
| 157036 | 07/03 | |
| 157128 | 07/03 | |
| 157704 | 06/03 | |
| 157735 | 06/03 | |
| 161034 | 12/03 | |
| 161068 | 11/03 | |
| 161112 | 12/03 | |
| 161246 | 12/03 | |
| 161920 | 01/04 | |
| 161737 | 12/03 | |
| 161920 | 01/04 | |
| 162053 | 01/04 | |
| 162664 | 03/04 | |
| 162708 | 02/04 | one of the first M1A SOCOM models |

| | | |
|---|---|---|
| 162961 | 03/04 | |
| 163386 | 04/04 | |
| 164618 | 05/04 | |
| 164659 | 05/04 | |
| 164758 | 05/04 | |
| 164935 | 06/04 | |
| 165375 | 07/04 | |
| 165747 | 07/04 | |
| 165774 | 07/04 | exported to the Netherlands |
| 165787 | 07/04 | |
| 166719 | 08/04 | |
| 166784 | 08/04 | |
| 166912 | 09/04 | |
| 167417 | 09/04 | |
| 169375 | 12/04 | |
| 169425 | 12/04 | |
| 169790 | 12/04 | |
| 169858 | 12/04 | |
| 170157 | 01/05 | |
| 170616 | 02/05 | |
| 171127 | 02/05 | |
| 171275 | 01/05 | sold as a receiver |
| 171450 | 03/05 | |
| 172009 | 03/05 | |
| 172203 | 03/05 | |
| 173180 | 06/05 | |
| 173559 | 05/05 | |
| 174269 | 05/05 | |
| 174514 | 05/05 | |

| | | |
|---|---|---|
| 175055 | 06/05 | |
| 175450 | 06/05 | |
| 176067 | 08/05 | |
| 176167 | 07/05 | |
| 176635 | 07/05 | |
| 177998 | 09/05 | |
| 178046 | 10/05 | |
| 178216 | 09/05 | |
| 178745 | 11/05 | |
| 178800 | 09/05 | |
| 178898 | 10/05 | |
| 179887 | 11/05 | |
| 181429 | 12/05 | |
| 182201 | 01/06 | |
| 182867 | 01/06 | |
| 183075 | 03/06 | |
| 183335 | 02/06 | |
| 185270 | 04/06 | |
| 185394 | 05/06 | |
| 185796 | 04/06 | |
| 186793 | 05/06 | |
| 187500 | 06/06 | |
| 188946 | 07/06 | |
| 190814 | 09/06 | |
| 191506 | 09/06 | |
| 191530 | 10/06 | exported to the Netherlands |
| 192257 | 09/06 | |
| 192573 | 09/06 | |
| 192880 | 10/06 | |
| 193999 | 11/06 | |

| | | |
|---|---|---|
| 194804 | 12/06 | |
| 195221 | 12/06 | |
| 195312 | 12/06 | |
| 197242 | 03/07 | |
| 199310 | 03/07 | |
| 199322 | 04/07 | |
| 199466 | 04/07 | |
| 199983 | 04/07 | |
| 200668 | 05/07 | |
| 200971 | 05/07 | |
| 201344 | 09/07 | |
| 204907 | 08/07 | |
| 205330 | 08/07 | |
| 205659 | 08/07 | |
| 205579 | 08/07 | |
| 207121 | 10/07 | |
| 207703 | 10/07 | |
| 207738 | 09/07 | |
| 208909 | 11/07 | |
| 210737 | 12/07 | |
| 211528 | 12/07 | |
| 212210 | 01/08 | |
| 213387 | 03/08 | |
| 213954 | 03/08 | |
| 215294 | 03/08 | |
| 215395 | 04/08 | |
| 215445 | 05/08 | |
| 216351 | 04/08 | |
| 218144 | 06/08 | |
| 220922 | 07/08 | |

| | | |
|---|---|---|
| 22127X | 09/08 | |
| 224119 | 11/08 | |
| 224473 | 11/08 | |
| 2263XX | 01/09 | |
| 227131 | 01/09 | |
| 227819 | 02/09 | |
| 230112 | 08/00 | |
| 246XXX | 09/01 | |
| SM0117 | 09/91 | |
| SM0162 | 10/91 | |
| IDF026 | 05/99 | |
| IDF042 | 04/99 | |
| IDF067 | 07/99 | |
| WF027X | 12/02 | |

**Table 36: Smith Enterprise, Inc.**

| Receiver Serial Number | Manufacture | Month and Year | Comments |
|---|---|---|---|
| 0012XX | investment cast | | |
| 001691 | investment cast | | |
| 001798 | investment cast | 09/88 purchase | sold as a receiver |
| 001799 | investment cast | 09/88 purchase | sold as a receiver |
| 001802 | investment cast | | sold as a receiver |
| 00185X | | | built in 1986 |
| 001915 | billet machined | 01/88 purchase | sold as a receiver, rear lugged |
| 001933 | billet machined | | sold as a receiver, rear lugged |
| 001940 | billet machined | | |
| 001985 | billet machined | | |
| 001999 | billet machined | 08/88 purchase | sold as a receiver |
| 002010 | billet machined | | |
| 002099 | investment cast | | made no later than 1988 |

| | | | |
|---|---|---|---|
| 1002100 | | 06/91 delivered | sold as a receiver |
| 1002102 | | 06/91 delivered | sold as a receiver |
| 002115 | investment cast | 1990 production | sold as a semi-auto M14K |
| 002122 | investment cast | | sold as a receiver, rear lugged |
| 1002122 | investment cast | | sold as a receiver, rear lugged |
| 1002128 | investment cast | | sold as a receiver, rear lugged |
| 002160 | billet machined | | |
| 002197 | investment cast | | |
| 002198 | investment cast | | |
| 002289 | billet machined | | rear lugged |
| 002292 | billet machined | | rear lugged |
| 002300 | billet machined | 12/92 delivered | sold as a receiver |
| 002326 | billet machined | | sold as a rear lugged receiver |
| 002371 | billet machined | | |
| 002380 | billet machined | 12/92 delivered | sold as a receiver |
| 002381 | billet machined | 12/92 delivered | sold as a receiver |
| 002504 | billet machined | 1991 production | double lugged receiver |
| 002513 | billet machined | | sold as a rear lugged receiver |
| 002556 | billet machined | | |
| 002584 | billet machined | | |
| 002585 | billet machined | | sold as a receiver |
| 00258X | billet machined | 03/94 manufacture | rear lugged |
| 00260X | billet machined | | rear lugged, highest observed pre-'94 ban serial number |
| 5019 | investment cast | 07/96 delivered | sold as a receiver |
| 5027 | investment cast | 07/96 delivered | sold as a receiver |
| 5031 | investment cast | 09/96 delivered | sold as a receiver |
| 5032 | investment cast | 09/96 delivered | sold as a receiver |
| 5049 | investment cast | 07/97 delivered | sold as a receiver |
| 5050 | investment cast | 07/97 delivered | sold as a receiver |

| | | | |
|---|---|---|---|
| 5063 | investment cast | 10/98 delivered | sold as a receiver |
| 5065 | investment cast | 10/98 delivered | sold as a receiver |
| 5071 | investment cast | 05/99 delivered | sold as a receiver |
| 5074 | investment cast | 07/99 delivered | sold as a receiver |
| 5075 | investment cast | 07/99 delivered | sold as a receiver |

**Table 37: Federal Ordnance, Inc.**

| Receiver Serial Number | Month and Year | Comments |
|---|---|---|
| 22XX | 02/26/87 per factory tag | USGI parts |
| 232X | | USGI parts |
| 3058 | | USGI parts imported from Israel |
| 394X | | USGI parts imported from Israel |
| 46XX | | USGI parts including H&R barrel |
| 4894 | 04/89 FFL delivery to original owner | USGI parts including Winchester barrel |
| 677X | 11/17/89 per factory tag | USGI parts |
| 7010 | 12/89 original owner purchase | USGI parts |
| 7089 | 06/89 original owner purchase | USGI parts |
| 8042 | | USGI parts |
| 824X | 02/01/90 on receiver | USGI parts |
| 8877 | | USGI parts |
| 9337 | | Chinese parts |
| 20440 | | Chinese parts |
| 205XX | | Chinese parts |
| 21136 | | Chinese parts |
| 21200 | | Chinese parts |
| 214XX | | Chinese parts |

| | | |
|---|---|---|
| 227XX | | Chinese parts |
| 23111 | 05/91 per factory tag | Chinese parts |
| 502XX | 09/13/91 per factory tag | Chinese parts |
| 50396 | | Chinese parts |
| 60308 | | highest observed serial number |

**Table 38: Entreprise Arms, Inc.**

| Receiver Serial Number | Month and Year | Comments |
|---|---|---|
| E00154 | 04/96 delivered to FFL | sold as a receiver |
| E00328 | 01/99 delivered to FFL | sold as a receiver |
| E00390 | 12/96 delivered to FFL | sold as a receiver |
| E00422 | 04/97 delivered to FFL | sold as a receiver |

**Table 39: Armscorp**

| Receiver Serial Number | Month and Year | Comments |
|---|---|---|
| A003095 | 06/88 delivered to FFL | sold as a receiver |
| A003283 | 02/88 delivered to FFL | sold as a receiver |
| A003309 | 02/88 delivered to FFL | sold as a receiver |
| A003337 | 02/88 delivered to FFL | sold as a receiver |
| A003912 | 04/89 purchase | |
| A004280 | 06/89 delivered to FFL | sold as a receiver |
| A005039 | 08/90 delivered to FFL | sold as a receiver |
| A00607X | 10/90 barrel installation | |
| A0070XX | 03/92 purchase | |
| 0071XX | 01/91 purchase | |
| 10370 | 05/94 delivered to FFL | sold as a receiver |
| 10451 | 04/93 manufacture | |

| | | |
|---|---|---|
| 10646 | 09/94 delivered to FFL | sold as a receiver |
| 115XX | 07/94 manufacture | sold as a complete rifle |
| 11999 | 08/94 purchase | sold as a receiver |
| 151XX | 05/99 purchase | |
| 15906 | 01/00 manufacture | |
| 16602 | 06/02 purchase | sold as a receiver |
| 16621 | 06/02 purchase | sold as a receiver |
| 16633 | 07/02 purchase | sold as a receiver |
| 1664X | 07/02 purchase | sold as a receiver |
| 17011 | 07/03 manufacture | |
| 17013 | 07/03 manufacture | |
| 1708X | 11/03 purchase | |
| 17096 | 12/03 purchase | sold as a barreled receiver |
| 1728X | 07/06 purchase | sold as a rear lugged XM25 receiver |
| 17396 | 05/06 purchase | sold as a barreled receiver |
| 17498 | 10/06 purchase | sold as a receiver |
| 17615 | 01/08 manufacture | |
| 17674 | 02/08 manufacture | sold as a receiver |
| 17675 | 02/08 manufacture | sold as a receiver |
| 7 | 09/92 shipped to FFL | sold as a receiver marked 5.56 MM M14 NM |
| MALONEY | 10/93 | personal rifle of Charles W. Maloney |
| WTA0001 through WTA0013 | 07/06 shipped to West Texas Armory | shipped as receivers |

**Table 40: Fulton Armory**

| Receiver Serial Number | Month and Year | Comments |
|---|---|---|
| FA0101 to FA0110 | 02/03 to 04/03 manufactured | |
| FA0240 | 11/03 purchase | |
| FA0550 | 08/05 | |
| FA0701 | 12/06 delivered | |

**Table 41: LRB Arms**

| Receiver Serial Number | Month and Year | Comments |
|---|---|---|
| X00101 | 12/02 | sold as a receiver |
| X00109 | 01/03 | replacement receiver for seized MKS M14-A-1 receiver |
| 01001 | 10/03 purchase | sold as a receiver |
| 01011 | 09/03 purchase | sold as a receiver |
| 01012 | 09/03 purchase | sold as a receiver |
| 01018 | 09/03 purchase | sold as a barreled receiver |
| 0102X | 11/04 purchase | sold as a barreled receiver |
| 01038 | 09/03 purchase | sold as a receiver |
| 01210 | 10/03 purchase | sold as a receiver |
| 01211 | 09/03 purchase | sold as a receiver |
| 01217 | 10/03 purchase | highest observed dot matrix serial number |
| 01227 | | lowest observed die stamp serial number |
| 01237 | 01/05 built into rifle at LRB | die stamp serial number |
| 01263 | 09/06 built into rifle at LRB | |
| 01275 | 01/04 shipped to FFL | sold as a barreled receiver |

| | | |
|---|---|---|
| 01278 | 09/06 built into rifle at LRB | |
| 0128X | 01/06 built into rifle at LRB | |
| 0129X | 01/05 shipped to FFL | |
| 0129X | 08/06 built into rifle at LRB | |
| 01301 | 09/06 built into rifle at LRB | |
| 01304 | 10/04 purchase | sold as a barreled receiver |
| 0131X | 09/04 purchase | sold as a receiver |
| 01318 | 05/04 purchase | sold as a rear lugged receiver |
| 0132X | 09/04 purchase | sold as a receiver |
| 01339 | 05/04 shipped to FFL | sold as a receiver |
| 0134X | 02/06 built into rifle at LRB | |
| 01364 | 07/04 purchase | sold as a receiver |
| 01367 | 09/06 built into rifle at LRB | |
| 0138X | 08/06 shipped to FFL | sold as a complete rifle |
| 01385 | 09/04 shipped to FFL | sold as a receiver |
| 01386 | 09/04 shipped to FFL | sold as a receiver |
| 01408 | 12/04 shipped to FFL | sold as a receiver |
| 01437 | 01/05 purchase | sold as a receiver |
| 01444 | 01/05 purchase | sold as a receiver |
| 01445 | 01/05 purchase | sold as a receiver |
| 01451 | 02/05 delivered | sold as a barreled receiver |
| 01494 | 03/05 shipped to FFL | |
| 01498 | 02/05 delivered | sold as a barreled receiver |
| 0151X | 03/05 purchase | sold as a barreled receiver |
| 01531 | 05/05 shipped to FFL | sold as a barreled receiver |
| 01533 | 03/05 shipped to FFL | sold as a receiver |
| 01534 | 05/05 delivered | sold as a barreled action |
| 01537 | 04/05 shipped to FFL | sold as a barreled receiver |
| 01545 | 04/05 built into rifle at LRB | |
| 01548 | 05/05 shipped to FFL | sold as a receiver |

| | | |
|---|---|---|
| 01550 | 05/05 purchase | sold as a receiver |
| 01555 | 03/06 purchase | sold as a complete rifle |
| 01584 | 01/06 purchase | sold as a complete rifle |
| 0159X | 09/05 purchase | |
| 01606 | 09/05 built into rifle at LRB | |
| 01612 | 07/05 delivered | sold as a receiver |
| 01629 | 09/05 purchase | sold as a barreled receiver |
| 0164X | 12/05 built into rifle at LRB | |
| 01645 | 05/05 purchase | sold as a rear lugged receiver |
| 01646 | 03/06 built into rifle at LRB | |
| 01652 | 11/05 purchase | sold as a rear lugged receiver |
| 01659 | 09/06 built into rifle at LRB | |
| 0166X | 01/06 built into rifle at LRB | |
| 01665 | 09/06 built into rifle at LRB | |
| 01668 | 11/05 built into rifle at LRB | |
| 01705 | 06/06 built into rifle at LRB | |
| 01707 | 06/06 built into rifle at LRB | |
| 01711 | 06/06 purchase | sold as a receiver |
| 01724 | 08/06 built into rifle at LRB | |
| 01732 | 10/06 built at LRB | sold as a barreled receiver |
| 01738 | 11/06 delivered | sold as a receiver |
| 01739 | 11/06 shipped to FFL | sold as a receiver |
| 01750 | 10/06 delivered | sold as a barreled receiver |
| 01783 | 11/06 built into rifle at LRB | |
| 01824 | 12/06 built into rifle at LRB | |
| 01827 | 12/06 built into rifle at LRB | |
| 01833 | 01/07 built into rifle | |
| 01844 | 01/07 built into rifle at LRB | |
| 01846 | 04/07 built at LRB | sold as a barreled receiver |

| | | |
|---|---|---|
| 01854 | 03/07 shipped to FFL | sold as a rear lugged receiver |
| 01866 | 02/07 | sold as a rear lugged receiver |
| 01873 | 05/07 built into rifle at LRB | |
| 01885 | 05/07 shipped to FFL | sold as a receiver |
| 01886 | 05/07 shipped to FFL | sold as a receiver |
| 02111 | 08/07 shipped to FFL | sold as a receiver |
| 02112 | 08/07 shipped to FFL | sold as a receiver |
| 02129 | 08/07 built into rifle at LRB | |
| 02138 | 09/07 shipped to FFL | |
| 02149 | 09/07 shipped to FFL | sold as a receiver |
| 02168 | 09/07 built into rifle at LRB | |
| 02169 | 09/07 shipped to FFL | sold as a barreled receiver |
| 02200 | 11/07 purchase | sold as a barreled receiver |
| 02201 | 09/07 purchase | sold as a barreled receiver |
| 02207 | 10/07 purchase | sold as a receiver |
| 02220 | 11/07 shipped to FFL | sold as a barreled receiver |
| 02264 | 11/07 | sold as a rear lugged receiver |
| 02295 | 11/07 | sold as a receiver |
| 02313 | 11/07 shipped to FFL | sold as a barreled receiver |
| 02325 | 01/08 built into rifle at LRB | |
| 02345 | 12/07 shipped to FFL | sold as a barreled receiver |
| 02363 | 03/08 built into rifle at LRB | |
| 02539 | 01/09 shipped to FFL | sold as a barreled receiver |
| 10012 | 12/06 purchase | |
| 10045 | 02/07 built into rifle at LRB | |
| 10046 | 02/07 built into rifle at LRB | |
| 10049 | 04/07 built into rifle at LRB | |
| 10056 | 03/07 built into rifle at LRB | |

| | | |
|---|---|---|
| 10065 | 06/07 shipped to FFL | sold as a receiver |
| 10066 | 06/07 shipped to FFL | sold as a receiver |
| 10085 | 06/07 built into rifle at LRB | |
| 10149 | 04/07 manufactured | |
| 10153 | 06/07 shipped to FFL | sold as a barreled receiver |
| 10194 | 08/07 rifle built at LRB | |
| 10390 | 11/08 shipped to FFL | |
| 10411 | 12/08 built into rifle at LRB | |
| 10415 | 11/08 shipped to FFL | |
| 10417 | 11/08 shipped to FFL | |
| 10418 | 11/08 shipped to FFL | sold as a receiver |

# Appendix B

## M14 Rifle Item Descriptions and Stock Numbers

Much of the information in Appendix B was compiled by Thomas A. Buss in 1971. It is reproduced here with permission. In the tables below, FSN means Federal Stock Number and NSN denotes National Stock Number.

**Table 42: Barrel and Receiver Group Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| M14 Rifle | 7267000 | 1005-00-283-7695<br>1005-00-770-3559 | original drawing dated March 1955 |
| M14 Rifle with equipment | 8413866 | 1005-00-589-1271 | equipment includes sling, four magazines, combination tool and cleaning kit |
| M14 JROTC | | 1005-00-283-7695 | U. S. Marine Corps JROTC issue |
| M14 Rifle Group A (Port Security) | | 1005-LL-H18-7614 (NSN issued by the U. S. Navy) | U. S. Navy issue, double lugged receiver, fiberglass stock, heavyweight match grade barrel |
| M14 Rifle Group B (Match Rifle) | | 1005-LL-H18-7615 (NSN issued by the U. S. Navy) | U. S. Navy issue, rear lugged receiver, wood or fiberglass stock, heavyweight match grade barrel |
| M14 Sniper Kit | | 1005-01-106-8975 | U. S. Navy issue, includes sling, two magazines, scope and mount, cleaning kit, and aluminum carrying case |

| | | | |
|---|---|---|---|
| M14 M Rifle | 7790485 | 1005-678-9829 | issued with sling and magazine |
| M14 M Rifle with equipment | 5910842 | 1005-00-678-9829 | part number as listed in TM 9-1005-223-12P February 23, 1968, issued with sling and magazine |
| M14 NM Rifle | 7790476<br>9386974 | 1005-00-678-9828 | drawings originally dated April 1959 and September 1984 respectively |
| M14 NM Rifle with equipment | 5910841 | 1005-00-678-9828 | part number as listed in TM 9-1005-223-12P February 23, 1968, issued with sling and magazine |
| M14 NM Rifle with M84 scope | | 1005-937-8777 | |
| M14A1 Rifle without bipod and sling | 11010000 | | |
| M14A1 Rifle with equipment | 11010108 | 1005-00-072-5011 | original drawing dated January 07, 1964, issued with sling, magazine and bipod |
| M14E2 Rifle with equipment | 8427044 | | |
| M14 DMR Rifle | 98003A0000 | 1005-01-458-6235 | U. S. Marine Corps issue |

| | | | |
|---|---|---|---|
| M14 SMUD with equipment | EOD-M14 | 1005-01-255-3311 | U. S. Air Force issue, issued with telescope sight, scope mount and padded carry case |
| M14 | HGM14SEMI | 1005-01-494-4169 | U. S. Air Force issue, Honor Guard semi-automatic only |
| M14 | 7267000 | 1005-00-283-7695 | demilitarized for Junior Reserve Officer Training Corps |
| M14SSR | | 1005-LL-L99-5690 (NSN issued by the U. S. Navy) | U. S. Navy issue |
| M21 Rifle with equipment | 9386973<br>11838704 | 1005-00-179-0300 | original drawing 9386973 dated September 1984, issued with telescope sight, scope mount, sling, magazine, and cleaning kit |
| M25 (Sniper Rifle M14) | | 1005-LL-L99-5690 (NSN issued by the U. S. Navy) | replaced by the Mk 11 Mod 0 |
| M39 EMR | | 1005-01-553-5196 | U. S. Marine Corps issue |
| Mk 14 Mod 0 | | 1005-01-525-7718<br>1005-01-531-7324 | U. S. Navy issue |
| elevation knob assembly | 7267099 | 1005-628-9047<br>5355-00-628-9047 | calibratred in meters, original drawing dated July 1958 |

| | | | |
|---|---|---|---|
| elevation knob lock washer | 11010359<br>MS 35335-31 | | original drawing dated September 1965 |
| elevation knob indexing dog assembly | 11010362 | | original drawing dated September 1965 |
| elevation knob screw blank | 7267096 | | original drawing dated July 1958 |
| elevation knob indexing dog | 7267097 | | original drawing dated July 1958 |
| elevation knob | 7267098 | | original drawing dated July 1958 |
| elevation pinion assembly | 11010363 | 1005-999-3399<br>5355-00-999-3399 | original drawing dated September 1965 |
| windage knob assembly | 7312737 | 1005-731-2737<br>5355-00-731-2737 | original drawing dated December 1944 |
| windage knob nut | 7312726 | | original drawing dated December 1944 |
| windage knob nut lock | 7312731 | | original drawing dated December 1944 |
| windage knob spring | 7312732 | | original drawing dated December 1944 |
| windage knob assembly, National Match | 7790386 | 1005-649-9275<br>5355-00-649-9275 | original drawing dated November 1958 |
| windage knob, National Match | 7790358 | | original drawing dated November 1958 |

| | | | |
|---|---|---|---|
| rear sight aperture | 6008868 | 1005-00-600-8868 | original drawing dated August 1937 |
| rear sight base | 5546001 | 1005-00-554-6001 | original drawing dated August 1937 |
| rear sight base, National Match | 7791341 | 1005-875-6281 | marked NM/2, undercut for hooded aperture |
| rear sight base, National Match | 7791571 | 1005-754-6799<br>5340-00-754-6799 | marked NM/2A, original drawing dated November 1963 |
| rear sight cover | 6008872 | 1005-00-600-8872 | original drawing dated August 1937 |
| rear sight eyepiece, National Match | 7791131 | | marked 595, 0.0595 " peep hole original drawing dated December 1961 |
| rear sight eyepiece assembly, National Match | 7791132 | | original drawing dated December 1961 |
| rear sight aperture assembly, National Match | 7791133 | 1005-864-2926<br>1005-00-864-2926 | 0.0595 " peep hole, original drawing dated December 1961 |
| rear sight eyepiece, National Match | 7791281 | | marked 520, 0.0520 " peep hole, alternate design |
| rear sight aperture assembly, National Match | 7791282 | 1005-864-2928<br>1005-00-864-2928 | 0.0520 " peep hole, alternate design |
| rear sight aperture, National Match | 7791134 | | original drawing dated December 1961 |

| | | | |
|---|---|---|---|
| rear sight eyepiece spring, National Match | 7791135 | | two coil springs, original drawing dated December 1961 |
| rear sight eyepiece ball bearing, National Match | MS 19060-1 | | two required |
| rear sight eyepiece spring, National Match | 7791136 | | one cone disk spring, original drawing dated December 1961 |
| rear sight eyepiece retaining ring, National Match | MS 16624-18 | | |
| selector shaft pin | 96906-16562-107<br>MS 16562-107 | 5315-051-6891<br>5315-00-051-6891 | interchangeable with the spindle valve pin and connector pin, 5/64 " diameter x 3/8 " long |
| selector lock | 7267172 | 1005-587-8420<br>1005-00-587-8420 | standard for M14, M14 M and M14 NM, original drawing dated October 1954 |
| selector switch | 7267071 | 1005-587-8408<br>1005-00-587-8408 | standard for M14A1, optional for M14 in lieu of selector lock, original drawing dated October 1954 |

| | | | |
|---|---|---|---|
| selector shaft spring | 7267081 | 1005-587-8415<br>5360-00-587-8415 | standard for M14A1, optional for M14 in lieu of selector lock, original drawing dated September 1954 |
| selector shaft | 7267072 | 1005-587-8409<br>3040-00-587-8409 | original drawing dated October 1954 |
| sear release | 7790192 | 1005-628-9053<br>1005-00-628-9053 | original drawing dated July 1958 |
| gas cylinder plug | 7267053 | 1005-00-587-8400 | original drawing dated October 1954 |
| gas cylinder piston | 7267047 | 1005-00-587-8398 | original drawing dated October 1954 |
| gas cylinder piston, National Match | 9352724 | | gas piston with axial groove, original drawing dated June 1982 |
| flash suppressor setscrew | 7790300<br>MS 51976-16 | 5305-042-6426<br>5305-01-221-3230 | late version, full dog point, make from 6-40 x 0.25 " setscrew, tip is 0.092 ” diameter x 0.070 " long, original drawing dated July 1958 |
| flash suppressor nut | 7267039 | 1005-00-587-8394 | original drawing dated November 1954 |
| flash suppressor | 7267088 | | early version |

| | | | |
|---|---|---|---|
| flash suppressor | 7791053 | 1005-545-1573<br>1005-00-545-1573 | late version, original drawing dated September 1960 |
| flash suppressor, National Match | 9352718 | 1005-01-267-2093 | M14 NM, original drawing dated June 1982 |
| flash suppressor, M14 DMR | 98003A1001 | 1005-01-471-3532 | M14 DMR |
| front sight, National Match | 7791122 | 1005-00-980-5203 | marked NM 062, original drawing dated November 1961 |
| front sight, standard | 7790233 | | early version |
| front sight, standard | 7791445 | 1005-084-8435<br>1005-00-084-8435 | late version, original drawing dated October 1962 |
| front sight screw | 96906-35460-3<br>MS 35460-3 | 5305-655-9483<br>5305-00-655-9483 | early version, 3/32 " socket cap screw, 40 NF x ½ " long |
| front sight screw | 11010298 | 5305-00-921-6155 | late version, 7/64 " socket cap screw, 40 NF x ½ " long, original drawing dated November 1964 |
| front sight screw | MS 16998-11 | 5305-983-6650 | late version, 7/64 " socket, cadmium plated |
| gas cylinder lock | 7790188 | 1005-00-628-9051 | original drawing dated July 1958 |

| | | | |
|---|---|---|---|
| gas cylinder | 7267013 | | early version with no lip |
| gas cylinder | 7790902 | 1005-790-8766<br>1005-00-790-8766 | late version with lip, original drawing dated March 1960 |
| gas cylinder and band assembly, National Match | 9352725 | | M14 NM, original drawing dated June 1982 |
| gas cylinder and band assembly, M14 DMR | 98003A1002 | 1005-01-472-3924 | M14 DMR |
| spindle valve pin | 96906-16562-107<br>MS 16562-107 | 5315-051-6891<br>5315-00-051-6891 | interchangeable with the selector shaft pin and connector pin, 5/64 " diameter x 3/8 " long |
| spindle valve pin | MS 171401 | | M14 DMR |
| spindle valve (gas cutoff valve) | 7267604 | 1005-00-587-8421 | original drawing dated December 1954 |
| spindle valve spring | 7267605 | 1005-587-8422<br>5360-00-587-8422 | original drawing dated December 1954 |
| front band | 7267001 | 1005-587-8375<br>1005-00-587-8375 | original drawing dated September 1954 |
| operating rod guide pin | MS 16562-130 | | first version |
| operating rod guide pin | 96906-51923-465<br>MS 51923-465 | 5315-00-923-9440 | 1/8 " diameter x 3/4 " long |
| operating rod guide pin | 96906-51923-291<br>MS 51923-291 | 5315-00-993-3247 | 1/8 " diameter x 3/4 " long |

| | | | |
|---|---|---|---|
| operating rod guide | 7267025 | 1005-587-8385<br>1005-00-587-8385 | original drawing dated October 1954 |
| operating rod guide, National Match | 9349846 | | original drawing dated March 1982 |
| bolt lock pin | 96906-16562-124<br>MS 16562-124 | 5315-00-839-0897 | 3/32 " diameter x 1 " long |
| bolt lock | 7267034 | 1005-00-587-8390 | original drawing dated December 1954 |
| bolt lock spring | 7267074 | 1005-587-8411<br>5360-00-587-8411 | original drawing dated September 1954 |
| connector lock pin | 7267042 | 5315-00-587-8396 | original drawing dated August 1954 |
| connector lock | 7267035 | 1005-00-587-8391 | original drawing dated September 1954 |
| cartridge clip guide pin | 96906-16562-120<br>MS 16562-120 | 5315-051-8636<br>5315-00-051-8636<br>5315-00-058-6065 | 3/32 " diameter x 9/16 " long |
| cartridge clip guide | 7790184 | 1005-628-9049<br>1005-00-628-9049 | original drawing dated July 1958 |
| barrel, chromium plated | 7790190 | 1005-628-9052<br>1005-00-628-9052 | original drawing dated July 1958 |
| barrel and receiver assembly | 7790191 | | chromium plated barrel, original drawing dated July 1958 |
| barrel and receiver assembly, National Match | 9352636 | | original drawing dated May 1982 |

| | | | |
|---|---|---|---|
| receiver lug | 9352637 | 1005-01-267-2167 | original drawing dated January 1986 |
| barrel, National Match | 7791173 | | chromium plated standard contour, original drawing dated November 1961 |
| barrel, National Match, | 7791362 | 1005-00-018-3255 | non-plated standard contour, original drawing dated December 1961 |
| barrel and receiver assembly, National Match | 7791363 | | receiver with non-plated standard contour barrel |
| barrel, National Match | 9345206 | 1005-01-120-4513 | non-plated medium weight contour, original drawing dated June 1981 |
| barrel, National Match | 9349847 | | non-plated heavyweight contour, original drawing dated March 1982 |
| barrel assembly, National Match | 9362529 | 1005-01-272-0970 | non-plated heavyweight contour barrel with operating rod guide, original drawing dated March 1982 |
| barrel, M14 DMR | 98003A1220 | 1005-01-522-9955 | M14 DMR and M39 EMR, non-plated medium weight contour barrel |

| | | | |
|---|---|---|---|
| receiver | 7790189 | 1005-628-9052 | original drawing dated July 1958 |

**Table 43: Bolt Assembly Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| bolt | 7790185 | | original drawing dated July 1958 |
| bolt with roller | 7790186 | 1005-00-628-9050 | original drawing dated July 1958 |
| bolt assembly | 7790187 | | original drawing dated July 1958 |
| bolt roller | 7267065 | 1005-00-587-8405 | original drawing dated September 1954 |
| bolt roller retaining ring (bolt roller retainer) | 7267059 | 1005-00-587-8402 | original drawing dated September 1954 |
| extractor, early | 5546003 | 1005-554-6003<br>1005-00-554-6003 | M1/early M14 extractor |
| extractor, early modified | 5546003 | 1005-554-6003<br>1005-00-554-6003 | early M14 extractor with field modification (1/64 " of the bottom corner of the claw filed away) |
| extractor, late | 7791578 | 1005-953-9504<br>1005-00-953-9504 | late M14 extractor, original drawing dated October 1954, design changed to late style in March 1963 |

| | | | |
|---|---|---|---|
| extractor, M14 DMR | 98003A1231 | 1005-01-472-3098 | M14 DMR |
| extractor spring | 6008886 | 5360-00-600-8886 | original drawing dated August 1937 |
| extractor spring plunger | 5013671 | 1005-00-501-3671 | original drawing dated August 1937 |
| extractor spring with plunger | 6008618 | 1005-600-8618<br>5340-00-600-8618 | original drawing dated August 1937 |
| ejector | 7267014 | | original drawing dated June 1954 |
| ejector spring | 7267959 | | original drawing dated September 1955 |
| ejector with spring | 7267015 | 1005-00-587-8381 | original drawing dated June 1954 |
| firing pin | 7267043 | 1005-587-8397 | first version, non-plated, original drawing dated August 1954 |
| firing pin | 7791417 | 1005-962-8344<br>1005-00-962-8344 | second version, chromium plated tip, original drawing dated April 1962 |
| firing pin | 11686413 | 1005-00-921-5248 | third version, 100 % chromium plated, original drawing dated October 1965 |

**Table 44: Operating Rod Group Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| connector assembly | 7267012 | | early style with slot for the connector lock |
| connector assembly | 7790424 | 1005-678-9824 3040-00-678-9824 | original drawing dated April 1959 |
| connector assembly | 98003A1004 | 1005-01-472-3121 | M14 DMR |
| connector pin | 96906-16562-107 MS 16562-107 | 5315-051-6891 5315-00-051-6891 | interchangeable with spindle valve pin and selector shaft pin, 5/64 " diameter x 3/8 " long |
| connector plunger | 7790426 | 1005-678-9826 5340-00-678-9826 | original drawing dated April 1959 |
| connector spring | 7790427 | 1005-678-9827 5340-00-678-9827 | original drawing dated April 1959 |
| connector body | 7790425 | 1005-678-9825 | original drawing dated April 1959 |
| operating rod spring guide | 7267027 | 1005-00-587-8386 | original drawing dated October 1954 |
| operating rod spring guide, National Match | 9352726 | | original drawing dated June 1982 |
| operating rod spring guide, M14 DMR | 98003A1005 | 1005-01-472-3905 | M14 DMR |

| | | | |
|---|---|---|---|
| operating rod spring | 7267079 | 1005-587-8413<br>5360-00-587-8413 | original drawing dated September 1954 |
| operating rod | 7267064 | 1005-00-587-8404 | original drawing dated September 1954 |

**Table 45: Firing Mechanism Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| complete firing mechanism | 7790195 | | original drawing dated July 1958 |
| complete firing mechanism, National Match | 9354354 | | original drawing dated June 1982 |
| sear | 7267070 | | original drawing dated August 1954 |
| sear, National Match | 5546016 | | semi-automatic fire only, original drawing dated August 1937 |
| trigger | 5546020 | | original drawing dated August 1937 |
| trigger pin | 5013669 | 5315-501-3669<br>5315-00-501-3669 | early version |
| trigger pin | 7791367 | 5315-00-819-4501 | late version, original drawing dated April 1962 |
| sear pin | 5013673 | | original drawing dated August 1937 |

| | | | |
|---|---|---|---|
| trigger and sear assembly | 7267090 | 1005-587-8419<br>1005-00-587-8419 | original drawing dated September 1954 |
| trigger and sear assembly | 5546026 | 1005-00-554-6026 | M14 NM and M21, original drawing dated August 1937 |
| trigger and sear assembly | 98003A3001 | 1005-01-471-1810 | M14 DMR |
| hammer spring housing | 6008883 | 1005-00-600-8883 | original drawing dated August 1937 |
| hammer spring housing, National Match | 8448292 | | original drawing dated May 1969 |
| hammer spring | 6008887 | 5360-00-600-8887 | original drawing dated August 1937 |
| hammer spring plunger | 6008880 | 5340-00-600-8880 | original drawing dated August 1937 |
| hammer spring plunger, National Match | 8448692 | 1005-01-154-8337 | original drawing dated March 1971 |
| hammer pin | 5013668 | 5315-00-501-3668 | 0.187 " diameter x 3/4 " long under head, original drawing dated August 1937 |
| hammer | 5546008 | 1005-00-554-6008 | original drawing dated August 1937 |
| hammer, National Match | 8448293 | | original drawing dated May 1969 |
| safety | 5546015 | 1005-00-554-6015 | original drawing dated April 1937 |

| | | | |
|---|---|---|---|
| safety spring | 7267080 | 5360-00-587-8414 | M1 rifle clip ejector can be cut to 1.1 " length as an emergency repair, original drawing dated September 1954 |
| trigger guard | 7790194 | 1005-628-9054 | early style with hammer stop pin |
| trigger guard | 7790990 | 1005-00-587-6988 | late style with bent tab, produced from May 1962 onward, original drawing dated September 1960 |
| trigger housing assembly | 7790196<br>8448290 | 1005-00-628-9055 | original drawings dated July 1958 and May 1969 respectively |
| trigger housing | 7267030 | | original drawing dated October 1954 |
| magazine latch pin | MS 9047-102 | | early version |
| magazine latch pin | 7791418 | 5315-00-994-4242 | late version, original drawing dated August 1962, 0.121 " diameter x 0.640 " long |
| magazine latch | 7267032 | 1005-00-587-8389 | original drawing dated August 1954 |
| magazine latch spring | 7267041 | 1005-00-587-8395 | original drawing dated August 1964 |

**Table 46: M14 Stock and Hand Guard Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| butt stock sling swivel | 6008889 | 1005-600-8889<br>1005-00-600-8889 | original drawing dated August 1937 |
| lower butt screw | 6008881 | 5305-600-8881<br>5305-00-600-8881 | slot drive, 0.216 " diameter x 28 NF-2A x 3.171 " long, original drawing dated August 1937 |
| upper butt screw | 6146873 | 1005-614-6873<br>5305-00-614-6873 | M14A1 and wood stock with M1 rifle butt plate, original drawing dated March 1935 |
| upper butt screw | 7791036 | 1005-474-2754<br>5305-00-474-2754 | 0.212 " diameter, 10 threads per inch, 1.140 " grip length, 2.136 " long, for wood stock with hinged butt plate, original drawing dated August 1960 |
| upper butt screw | 7791267 | 5305-999-1875<br>5305-00-999-1875 | for production reinforced fiberglass stock, original drawing dated July 1965 |
| upper butt screw nut retainer | 11010414 | 5340-999-1864<br>5340-00-999-1864 | for production reinforced fiberglass stock, original drawing dated July 1965 |

| | | | |
|---|---|---|---|
| upper butt screw nut (10-32 threads) | 7791339 | 5310-999-1891 5310-00-999-1891 | for production reinforced fiberglass stock, 10 - 32 square nut, original drawing dated July 1965 |
| wood stock that fits the M1 rifle butt plate | 7267083 per Picatinny Arsenal CMT IG Number 38 dated 2 January 1958 | | T44E4 bare walnut stock |
| wood stock that fits the M1 rifle butt plate | 7267084 per Picatinny Arsenal CMT IG Number 38 dated 2 January 1958 | | T44E4 walnut stock with butt plate, ferrule, front and rear sling swivels, stock liner and liner screws |
| wood stock assembly | 7790702 | | M14 stock includes the front and rear sling swivels, stock liner, liner screws, ferrule and butt plate assembly |
| wood stock subassembly | 7790810 | | M14 stock subassembly for 7790702, includes stock, ferrule, front sling swivel, stock liner and liner screws |
| wood stock, National Match | 7791174 | | M14 NM bare stock for 7791175 and 11010282 |

| | | | |
|---|---|---|---|
| wood stock assembly, National Match | 7791175 | | M14 NM stock includes front and rear sling swivels, ferrule, stock liner, liner screws and butt plate assembly, original drawing dated December 1961 |
| wood stock subassembly, National Match | 7791280 | | M14 NM stock subassembly for 7791175, includes front sling swivel, ferrule, stock liner and liner screws, original drawing dated December 1961 |
| wood stock, National Match | 9352638 | 1005-01-233-8635 | M14 NM bare stock for 9392337, routed for bedding, original drawing dated May 1982 |
| wood stock subassembly, National Match | 9381706 | | M14 NM stock subassembly for 9392337 with front sling swivel, ferrule, and routed for bedding, original drawing dated May 1984 |
| wood stock assembly, National Match | 9392337 | | M14 NM stock with front and rear sling swivels, ferrule, butt plate assembly, routing and bedding, original drawing dated May 1984 |

| | | | |
|---|---|---|---|
| wood stock | 11010262 | | M14 stock includes ferrule, original drawing dated June 1964 |
| wood stock | 11010263 | 1005-754-6462 | M14 and M14 NM bare stock, original drawing dated June 1964 |
| wood stock assembly, National Match | 11010281 | | M14 NM stock includes front and rear sling swivels, ferrule, stock liner, liner screws, butt plate assembly, routing and bedding, original drawing dated June 1964 |
| wood stock subassembly, National Match | 11010282 | 1005-00-912-3711 | M14 NM stock subassembly includes stock, ferrule, stock liner, liner screws and routing, replaced 7791175, original drawing dated June 1964 |
| stock liner | 7267033 | | early version |
| stock liner screw | 7267063 | | two per wood stock, 10-32 threads, 7/16 " overall length |
| stock ferrule | 7267017 | | M14 and M14A1, original drawing dated October 1954 |
| stock ferrule | 9352720 | 1005-01-271-1027 | M14 NM stock 9392337 |

| | | | |
|---|---|---|---|
| stock rivet, tubular oval head | 7790473<br>MS 16535-302 | | M14 wood stock, original drawing dated September 1959 |
| stock rivet, tubular oval head | 11010260<br>MS 16535-307 | 5320-01-272-5023 | M14 reinforced fiberglass stock, original drawing dated June 1964 |
| stock rivet, solid, belt | MS 35745-18 | | M14 NM and M21 |
| stock rivet burr | 7790474 | 1005-072-5381<br>5310-00-072-5381 | original drawing dated September 1959 |
| sling swivel bracket | 7267007 | | original drawing dated September 1954 |
| sling swivel loop | 7267037 | | original drawing dated September 1954 |
| sling swivel loop assembly | 7267089 | 1005-00-919-7278 | M14, original drawing dated September 1954 |
| sling swivel loop assembly | 9352716 | 1005-01-271-1029 | M14 NM, original drawing dated June 1982 |
| pin, straight, knurled | 11010261 | | M14 reinforced fiberglass stock pin inside the butt stock, original drawing dated July 1965 |

| | | | |
|---|---|---|---|
| screw retaining plate | 7791340 | | reinforced fiberglass stock plate inside the grip, original drawing dated July 1965 |
| production reinforced fiberglass stock | 11686426 | | original drawing dated December 1965 |
| production reinforced fiberglass stock subassembly | 11686427 | | stock with ferrule, original drawing dated December 1965 |
| production reinforced fiberglass stock assembly | 11686428 | | stock includes the butt plate, front sling swivel and ferrule, original drawing dated December 1965 |
| production reinforced fiberglass stock subassembly | 5910348 | 1005-00-999-1871 | subassembly consists of stock, upper butt screw, nut retainer and nut |
| hand guard band | 6008870 | | also known as hand guard clip, original drawing dated August 1937 |
| hand guard assembly | 7267021 | 1005-587-8382 | walnut hand guard with metal clip |
| hand guard assembly | 7790689 | 1005-690-4068 | slotted fiberglass hand guard with metal clip |
| hand guard | 7791285 | | solid fiberglass hand guard, original drawing dated October 1961 |

| | | | |
|---|---|---|---|
| hand guard, National Match | 9352722 | | M14 NM, original drawing dated June 1982 |
| hand guard assembly | 7791286 | 1005-856-2108 1005-00-856-2108 | solid fiberglass hand guard with metal clip, original drawing dated October 1961 |
| hand guard assembly, National Match | 9352721 | | M14 NM, original drawing dated June 1982 |
| hand guard assembly, M14 DMR | 98003A1008 | 1005-01-472-3209 | |

**Table 47: M14 Stock Butt Plate Assembly Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| M1 butt plate assembly | 5564277 | 1005-556-4277 | for early M14 stock with M1 butt plate |
| M1 butt plate hinge pin | 5152865 | 5315-515-2865 | interchangeable with M14 stock butt plate door pin, 0.126 " diameter x 1.00 " long, original drawing dated March 1940 |
| M1 butt plate plunger | 5152864 | 1005-515-2864 | for early M14 stock with M1 butt plate |
| M1 butt plate catch spring | 5152863 | 1005-515-2863 | for early M14 stock with M1 butt plate |
| M1 butt plate door | 6147465 | 1005-614-7465 | for early M14 stock with M1 butt plate |

| | | | |
|---|---|---|---|
| M1 butt plate | 5564283 | 1005-556-4283 | for early M14 stock with M1 butt plate |
| M14 butt plate assembly | 7790686 | 1005-690-4067<br>1005-00-690-4067 | original drawing dated September 1959 |
| M14 butt plate hinge pin | 7790695 | 1005-981-1254<br>5310-00-981-1254 | original drawing dated September 1959 |
| M14 butt plate stop pin | 7790695 | 1005-981-1254<br>1005-00-981-1254 | original drawing dated September 1959 |
| M14 butt plate | 7790696 | | original drawing dated September 1959 |
| M14 butt plate rest | 7790697 | 1005-981-1255<br>1005-00-981-1255 | also known as butt plate flapper, original drawing dated September 1959 |
| M14 butt plate ball bearing | 96906-19059-49<br>MS 19059-49<br>96906-19059-88<br>MS 19059-88 | 3110-100-6151<br>3110-00-100-6151 | |
| M14 butt plate hinge spring | 5013747 | 1005-501-3747<br>5360-00-501-3747 | original drawing dated February 1935 |
| M14 butt plate door pin | 96906-16562-98<br>MS 16562-98 | 5315-597-5086<br>5315-00-597-5086 | 1/16 " diameter x 3/8 " long |
| M14 butt plate door catch | 7790693 | 1005-981-1252<br>1005-00-981-1252 | original drawing dated September 1959 |
| M14 butt plate door catch spring | 7790699 | 1005-981-1256<br>5360-00-981-1256 | original drawing dated September 1959 |

| | | | |
|---|---|---|---|
| M14 butt plate catch pin | 5152865 | 5315-515-2865<br>5315-00-515-2865 | original drawing dated March 1940 |
| M14 butt plate door plunger | 7790698 | | original drawing dated September 1959 |
| M14 butt plate door | 7790692 | | original drawing dated September 1959 |
| M14 hinge block | 7790691 | | original drawing dated September 1959 |
| M14 butt plate assembly | 7790700 | | original drawing dated September 1959 |
| M14 hinge transition piece | 7790914 | | black soft rubber filler block that allows use of the M1 rifle butt plate on a standard M14 stock, not the same as the hinge inlet protector part number 7791050 |

**Table 48: M14E2/M14A1 Stock Assembly Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| stock assembly | 7791671 | | M14E2 |
| stock assembly | 11686528 | | M14A1, original drawing dated April 1966 |
| stock | 11686526 | | M14A1, original drawing dated April 1966 |

| | | | |
|---|---|---|---|
| stock liner plate | 7790200 | | |
| stock liner | 7790202 | | |
| stock liner assembly | 7790201 | | late version |
| stock liner screw | 7267063 | | two required, 10-32 threads, 7/16 " overall length |
| recoil pad plug | 7791674 | 1005-072-5386 1005-00-072-5386 | two required, lusterless black color, original drawing dated September 1963 |
| lower recoil pad screw | 7791676 | 1005-072-5388 5305-00-072-5388 | original drawing dated September 1963 |
| butt stock sling swivel bushing | 11010047 | 1005-072-5379 5325-00-072-5379 | original drawing dated October 1963 |
| butt stock sling swivel | 11010046 | 1005-072-5378 | original drawing dated October 1963 |
| upper recoil pad screw | 7791677 | 1005-072-5389 5305-00-072-5389 | original drawing dated September 1963 |
| recoil pad | 7791673 | 1005-072-5385 1005-00-072-5385 | early version made of natural rubber, late version made of synthetic rubber to minimize deterioration from oil and cleaning liquids, lusterless black color, original drawing dated September 1963 |

| | | | |
|---|---|---|---|
| butt plate bracket screw | 6146873 | 1005-614-6873<br>5305-00-614-6873 | two required, original drawing dated March 1935 |
| butt plate flapper assembly | 7791678 | 1005-072-5390<br>1005-00-072-5390 | original drawing dated September 1963 |
| butt plate flapper pin | 7791682 | 1005-016-2624<br>5315-00-016-2624 | original drawing dated September 1963 |
| butt plate flapper (shoulder rest plate) | 7791683 | | original drawing dated September 1963 |
| butt plate bracket | 7791680 | | |
| butt plate bracket pin | 7791681 | | |
| butt plate bracket assembly | 7792062 | | original drawing dated September 1963 |
| hand grip rubber bumper | 11010048 | 1005-072-5380 | for early stock burr version, four required |
| hand grip rubber bumper or grommet | 11686524 | 5325-904-9303<br>5340-00-904-9303 | for late stock burr version, four required, original drawing dated April 1966 |
| hand grip screw | 7791675 | 1005-072-5380 | for early stock burr version, two required |
| hand grip screw | 11686523 | 5305-956-3401<br>5305-00-956-3401 | for late stock burr version, two required, original drawing dated April 1966 |

| | | | |
|---|---|---|---|
| hand grip lock washer | 96906-35335-32<br>MS 35335-32 or<br>MS 35335-46 | 5310-596-7691<br>5310-00-596-7691 | for early stock burr version, two required, No. 10 screw size |
| hand grip lock washer | 96906-35336-21<br>MS 35335-21 | 5310-194-9209<br>5310-00-194-9209 | for late stock version burr, two required |
| stock assembly burr | 7790474 | 1005-072-5381<br>5310-00-072-5381 | early stock version burr, two required, original drawing dated September 1959 |
| stock assembly burr | 11686522 | 1005-951-3254<br>1005-00-951-3254 | late stock version burr (backing plate), one required, original drawing dated April 1966 |
| hand grip assembly | 11010044 | 1005-072-5377<br>1005-00-072-5377 | original drawing dated October 1963 |
| hand grip latch assembly | 11010045 | | |
| upper hand grip pin | 96906-39086-205<br>MS 39086-205 or<br>MS 16562-143 | 5315-00-846-5998 | 3/16 " diameter x 7/8 " long |
| hand grip subassembly | 7791672 | 1005-016-2623 | original drawing dated October 1963 |
| lower hand grip pin | 96906-39086-211<br>MS 39086-211 or<br>MS 16562-147 | 5315-269-4080<br>5315-00-269-4080 | 0.187 " diameter x 1.750 " long |
| hand grip locking pin | 11010002 | | |

| | | | |
|---|---|---|---|
| hand grip locking spring | 11010003 | | |
| hand grip pin for locking pin and spring | MS 16562-95 or MS 39086-50 | 5315-00-845-7021 | |
| hand grip body | 11010050 | | |
| hand grip | 11010001 | | original drawing dated October 1963 |
| front sling swivel pin | 96906-39086-202 MS 39086-202 or MS 51923-252 | 5315-050-1233 5315-00-050-1233 | 3/16 " diameter x ½ " long |
| front sling swivel | 6008890 | 1005-600-8890 1005-00-600-8890 | original drawing dated August 1937 |
| hand grip block | 11010004 | 1005-016-2621 1005-00-016-2621 | original drawing dated October 1963 |
| stock subassembly | 7791679 | 1005-072-5391 | M14E2 stock subassembly includes stock, stock liner and liner screws |
| stock subassembly | 11686527 | | M14A1 stock subassembly includes stock, ferrule, stock liner and liner screws, original drawing dated April 1966 |
| stock | 5910438 | 1005-999-4200 1005-00-999-4200 | M14E2 stock |

| | | | |
|---|---|---|---|
| M14E2/M14A1 sling | 11010038 | 1005-072-5376<br>1005-00-072-5376 | 64.5 " long, original drawing dated October 1963, essentially a M1918 Browning Automatic Rifle sling with an extra standard sling hook |
| M14E2/M14A1 sling keeper assembly | 8436759 | 5340-01-006-5806 | |
| M14E2/M14A1 sling assembly | 7149752 | | |
| M14E2/M14A1 hook assembly | 7136183 | | two required |

**Table 49: M14 DMR Stock Assembly Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| cheek rest, adjustable (cheekpiece) | 98003A2104 | 1005-01-470-6741 | |
| stock | 98003A2101 | | McMillan Fiberglass Stocks M2A model |
| escutcheon | 98003A2002 | 1005-01-470-9632 | |
| stock ferrule | 9352720 | 1005-01-271-1027 | |
| bipod mounting stud | 98003A2003 | 5307-01-472-3395 | |
| front sling swivel screw | 98003A2004 | 5305-01-472-3539 | two required |

| | | | |
|---|---|---|---|
| front sling swivel, M14 DMR | 98003A2001 | 1005-01-472-4551 | |
| rear sling swivel | 6008889 | 1005-00-600-8889 | |
| cheek rest screw (cheekpiece screw) | 98003A2105 | 5305-01-472-3465 | two required |
| rear sling swivel screw | 98003A2005 | 5305-01-472-3465 | |
| butt pad spacing (butt pad spacer) | 98003A2103 | 1005-01-470-7122 | two available, ½ " |
| butt pad spacing (butt pad spacer) | 98003A2107 | 1005-01-470-7096 | two available, ¼ " |
| butt pad | 98003A2102 | 1005-01-470-7096 | |
| butt plate screw (screw, machine, rear butt plate) | 98003A2106 | 5305-01-470-7017 | two required |

**Table 50: Sage International Stock Assembly Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| stock chassis | 90900 | | |
| top cover | 90901 | | standard profile barrel |
| butt stock strut assembly | 90903 | | |
| butt stock main body assembly | 90904 | | |
| pistol grip butt stock | 90905 | | |

| | | | |
|---|---|---|---|
| vertical grip assembly | 90906 | | |
| fore grip (hand guard) | 90907 | | |
| cheek rest | 90908 | | |
| elevator cheek rest support | 90909 | | |
| recoil pad | 90910 | | |
| butt plate spacer | 90911 | | |
| elevator cheek rest lock wrench | 90912 | | |
| chassis sling attachment plate | 90913 | | |
| chassis operating rod guide | 90914 | | |
| bottom rail | 90915 | | |
| left side rail | 90916 | | |
| right side rail | 90917 | | |
| stock lock bar return spring | 90918 | | |
| pistol grip mounting screw | 90919 | | |
| pistol grip mounting screw lock washer | 90920 | | |

| | | | |
|---|---|---|---|
| pistol grip mounting screw flat washer | 90921 | | |
| cheek rest mounting screw | 90922 | | two required |
| recoil pad mounting screw | 90923 | | two required |
| elevator lock screw | 90924 | | |
| elevator lock nut | 90925 | | |
| butt stock strut stop screw | 90926 | | two required |
| butt stock secondary mounting screw | 90927 | | |
| butt stock secondary mounting screw flat washer | 90928 | | |
| butt stock primary mounting screw | 90929 | | |
| butt stock primary mounting screw flat washer | 90930 | | |
| operating rod guide screw | 90931 | | three required |
| top cover attachment screw | 90932 | | six required on standard profile top covers |
| bottom rail screw | 90933 | | four required |
| side rail screw | 90934 | | four required |

| | | | |
|---|---|---|---|
| front sling attachment | 90935 | | |
| front sling attachment back plate | 90936 | | |
| screw | 90937 | | two required |
| barrel tensioing screw | 90938 | | |
| barrel tensioning screw lock screw | 90939 | | |
| fore grip screw (hand guard screw) | 90940 | | two required |
| butt stock butt plate weldment assembly | 90941 | | |
| butt stock strut rod | 90942 | | two required |
| butt stock strut mounting screws | 90943 | | four required |
| butt stock sling attaching wire | 90944 | | |
| collapsible butt stock main body weldment | 90945 | | |
| lock bar | 90946 | | |
| lock bar actuacting bolt | 90947 | | |
| lock bar thumb release lever | 90948 | | |

| | | | |
|---|---|---|---|
| lock bar return spring retaining cup | 90949 | | |
| lock bar thumb release lever tension spring | 90950 | | |
| vertical grip body | 90951 | | |
| vertical grip tensioning knob assembly with attaching rod | 90952 | | |
| vertical grip cur clip | 90953 | | |
| elevator cheek rest support weldment assembly | 90954 | | |
| elevator cheek rest plunger stop screw | 90955 | | |
| spacer front band washer | 90956 | | |
| Picatinny rail section adaptor screw | 90957 | | |
| top cover | 90987 | | medium weight profile barrel |
| top cover | 90988 | | medium weight profile barrel with machining cut for Smith Enterprise scope mount |
| top cover | 90990 | | standard profile barrel with machining cut for Smith Enterprise scope mount |

| | | | |
|---|---|---|---|
| butt pad extension | 90995 | | adds 1 " length |
| butt pad extension screw | 91734 | | two required |
| chassis stock with telescoping butt stock, adjustable cheek rest and full butt pad | B009039 | | |
| stripper clip sight base | B009042 | | |
| chassis stock with receiver extension tube | B009044 | | |
| Picatinny rail section | B009047 | | mounts to bottom of fore grip (hand guard) |
| detachable cantilevered sight base | B009053 | | |
| | | | |

**Table 51: Twenty Round Magazine Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| magazine assembly | 7790183 | 1005-628-9048<br>1005-00-628-9048 | original drawing dated June 1958 |
| magazine base | 7790182 | | original drawing dated June 1958 |
| magazine spring | 7267078 | | original drawing dated October 1954 |

| | | | |
|---|---|---|---|
| magazine follower | 7267018 | | original drawing October 1954 |
| magazine follower assembly | 7267019 | | original drawing dated October 1954 |
| magazine follower stop | 7267085 | | original drawing dated October 1954 |
| magazine tube | 7790197 | | original drawing dated June 1958 |
| magazine latch plate | 7791098 | | original drawing dated June 1958 |

**Table 52: M2 Bipod Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| M2 bipod assembly | 7790688 | 1005-711-6202<br>1005-00-711-6202 | original drawing dated March 1960, some bipods are stamped 7790833 |
| pivot plunger pin | 96906-16562-96<br>MS 16562-96 | 5315-282-3642<br>5315-00-282-3642 | two required, 1/16 " diameter x ¼ " long |
| pivot plunger pin | 7790820 | 1005-772-6361<br>5930-00-772-6361 | two required, original drawing dated March 1960 |
| pivot plunger spring | 7790824 | 1005-772-6365<br>5360-00-772-6365 | two required, original drawing dated March 1960 |
| pivot plunger | 7792846 | 1005-740-0053<br>5340-00-740-053 | two required, original drawing dated February 1961 |

| | | | |
|---|---|---|---|
| leg plunger pin | 96906-16562-99<br>MS 16562-99 | 5315-514-2358<br>5315-00-514-2358 | two required, 1/16 " diameter x 7/16 " long |
| leg extension plunger | 7790836 | | two required, original drawing dated March 1960 |
| leg extension spring | 7790838 | 1005-897-6156<br>5360-00-897-6156 | two required, original drawing dated March 1960 |
| leg extension plunger housing | 7790841 | | two required |
| shaft stop pin | 96906-39086-88<br>MS 39086-88 | 5315-839-2327<br>5315-00-839-2327 | two required, 1/8 " diameter x 3/8 " long |
| leg screw | MS 16997-9 | 5305-978-9342<br>5305-00-978-9342 | February 1967 revision, 4-40 threads x ¼ " long, two required |
| leg screw nut | MS 35649-244 | 5310-167-1376<br>5310-00-167-1376 | February 1967 revision, 4-40 threads hex head nut, two required |
| right leg assembly | 7790822 | 1005-772-6363<br>1005-00-772-6363 | original drawing dated March 1960 |
| right shaft assembly | 7790840 | | original drawing dated March 1960 |
| right leg extension assembly | 7790839 | | original drawing dated March 1960 |
| right leg extension shoe (pad) | 7790844 | | |
| right leg extension tube | 7790845 | | |

| | | | |
|---|---|---|---|
| left leg assembly | 7790821 | 1005-772-6362<br>1005-00-772-6362 | original drawing dated March 1960 |
| left shaft assembly | 7790837 | | original drawing dated March 1960 |
| left leg extension assembly | 7790835 | | original drawing dated March 1960 |
| left leg extension tube | 7790843 | | |
| left leg extension shoe (pad) | 7790842 | | |
| head assembly | 7791106 | | original drawing dated November 1960 |
| cotter pin | MS 24665-149 | | early version, used for bipod without swivel |
| cotter pin | 96906-24665-151<br>MS 24665-151 | 5315-815-1405<br>5315-00-815-1405 | late version, 1/16 " x 3/8 " long |
| head assembly pin | 7791104 | 5315-474-4115 (cancelled by adoption of the long pin 7791669) | original drawing dated November 1960, short pin that won’t allow installation of the sling swivel, 0.217 " diameter, 1.041 " effective length, 1.25 " nominal length, 0.078 " cotter pin hole diameter |

| | | | |
|---|---|---|---|
| head assembly pin | 7791669 | 1005-072-5383<br>5315-00-072-5383 | original drawing dated September 1963, long pin that will allow installation of the sling swivel, 0.217 " diameter, 1.326 " effective length, 1.53 " nominal length, 0.078 " cotter pin hole diameter |
| bipod sling swivel | 7791670 | 1005-072-5384<br>1005-00-072-5384 | original drawing dated September 1963 |
| left jaw | 7791102 | 1005-474-4116<br>1005-00-474-4116 | original drawing dated November 1960, the jaws were improved in the period 1966 to 1967 |
| right jaw assembly | 7791107 | 1005-474-4118<br>1005-00-474-4118 | original drawing dated November 1960 |
| self-locking bolt | 7791103 | 5306-474-4114 | original drawing dated November 1960, 5/16 " diameter - 24 UNF x 3/4 " long self-locking hex head bolt with nylon insert |
| right jaw | 7791101 | | original drawing dated November 1960, the jaws were improved for better grip in the period 1966 to 1967 |

| | | | |
|---|---|---|---|
| welded head assembly | 7792847 | | original drawing dated February 1961 |

**Table 53: Organizational Maintenance Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| fabric envelope, two button | 7228907 | 1005-722-8907<br>1005-00-722-8907 | 3 " x 4 7/8 " |
| flash suppressor nut wrench | 7790315 | 4933-652-9949 | predecessor to 7790493 |
| flash suppressor nut pliers | 7790493 | 4933-690-3497<br>5120-00-690-3497 | 6 ¼ " overall length |
| ruptured case extractor | 7790352 | 4933-652-9950<br>4933-00-652-9950 | |
| barrel reflector | 7265789 | 1005-786-5789<br>1005-00-786-5789 | early version |
| barrel reflector | 7790138 | 4933-628-9700<br>4933-00-628-9700 | late version |
| M2 aiming device | 6174998 | 1005-617-4998 | |
| M15 sighting device | 7160903 | 6910-716-0903<br>6910-00-716-0903 | cardboard, 3 ½ " x 7 " |
| M63 dummy cartridge | 7553706 | | training device |
| brush, artist | 96906-16840<br>MS 16840 | 8020-244-0153<br>8020-00-244-0153 | 7/16 " wide x 1 1/8 " long |
| brush, cleaning | 96906-16746-29<br>MS 16746-29 | 7920-205-2401<br>7920-00-205-2401 | 1 1/16 " diameter x 2 7/8 " long |
| brush, camel hair | | 7920-00-205-0565 | M14 DMR |

| | | | |
|---|---|---|---|
| brush, cleaning | 8448462 | 1005-00-494-6602 | M14 DMR, Mk 14 Mod 0 |
| carbon removing compound | | 6850-00-965-2332 | P-C-111 and others |
| cleaning compound solvent (rifle bore cleaner) | | 6850-224-6656<br>6850-00-224-6656 | MIL-PRF-372,<br>2 ounces can |
| cleaning compound solvent (rifle bore cleaner) | | 6850-224-6657<br>6850-00-224-6657 | MIL-PRF-372,<br>8 ounces can |
| cleaning compound solvent (rifle bore cleaner) | | 6850-224-6658<br>6850-00-224-6658 | MIL-PRF-372,<br>1 quart can |
| cleaning compound solvent (rifle bore cleaner) | | 6850-224-6663<br>6850-00-224-6663 | MIL-PRF-372,<br>1 gallon can |
| cleaning compound solvent | | 6850-01-381-4401 | Mk 14 Mod 0,<br>Skysol 100 |
| cleaning compound solvent | | 7930-01-342-5316 | Mk 14 Mod 0,<br>Simple Green,<br>5 gallon container |
| cleaning compound solvent | | 7930-01-306-8369 | Mk 14 Mod 0,<br>Simple Green,<br>1 gallon container |
| cleaning compound solvent | | 7930-01-342-5317 | Mk 14 Mod 0,<br>Simple Green,<br>24 ounce bottle |
| bore cleaner | | | Mk 14 Mod 0,<br>Shooters Choice,<br>gallon size |
| gun grease | | | Mk 14 Mod 0,<br>Shooters Choice |

| | | | |
|---|---|---|---|
| abrasive cloth | | 5350-221-0872<br>5350-00-221-0872 | 9 " wide x 11 " long, 42-C-20420-50 |
| fluorescent coating compound | | 8010-811-1845<br>8010-00-811-1845 | red orange, 1 quart can, MIL-P-21563 No. 633 |
| dry cleaning solvent | | 6850-281-1985<br>6850-00-281-1985 | 1 gallon can, PS661 |
| grease, automotive and artillery | | 9150-01-197-7693 | 14 ounce cartridge, MIL-PRF-10924-G |
| grease, rifle | | 9150-00-248-3480 (replaced by 9150-00-754-0063) | 2.5 $cm^3$ plastic container with yellow cap, MIL-G-46003-A |
| grease, rifle | 8448693 | 9150-754-0063<br>9150-00-754-0063 | original drawing dated March 1971, 1 pound can, see latest edition of QPL-46003 for current qualified product |
| linseed oil, raw | | 8010-221-0611<br>8010-00-221-0611 | 1 gallon can, TT-L-00215 |
| lubricating oil, general purpose | | 9150-273-2389<br>9150-00-273-2389 | 4 ounces can, PL Special |
| lubricating oil, general purpose | | 9150-231-6689<br>9150-00-231-6689 | 1 quart can, PL Special |
| lubricating oil, semi-fluid | 8436792 | obsolete | 2 ounces flat oval bottle, MIL-L-46000C |
| lubricating oil, weapons | | 9150-00-292-9689 | 1 quart can, for below zero degrees operations |

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|---|---|---|---|
| cleaner, lubricant and preservative | | 9150-01-102-1473 | M14 DMR, ½ ounce bottle |
| cleaner, lubricant and preservative | | 9150-01-054-6453 | Mk 14 Mod 0, 1 pint bottle, MIL-PRF-63460 |
| cleaner, lubricant and preservative | | 9150-01-079-6124 | Mk 14 Mod 0, 4 ounce bottle |
| cleaner, lubricant and preservative | | 9150-01-053-6688 | Mk 14 Mod 0, 1 gallon can |
| bedding compound | | | M14 DMR, Marine-Tex, gray, 1 pound |
| clay, modeling | | 7510-00-275-2679 | M14 DMR, 1 pound |
| mold release compound | | 8030-01-064-4951 | M14 DMR, can |
| shim stock | | | M14 DMR |
| paper, lens | | 6640-00-663-0832 | M14 DMR, pack of 50 sheets |
| rag, wiping | DDD-R-30 | 7920-00-205-1711 | 50 pound bale, cotton, A-A-2522 |
| swab, small arms cleaning | 5019316 | 1005-00-288-3565 | 2 ½ " x 2 ½ ", cotton, 1 pack |
| acetone | | 6810-00-223-2739 | M14 DMR, 1 quart |

**Table 54: Direct Support Maintenance Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| tool and gage set for direct, general and depot maintenance | 8421895 | 4933-647-3703<br>4933-00-647-3703 | 7.62 MM Rifle, M14 Series |
| field maintenance gage case | 7799702 | 4933-678-9830<br>5220-00-678-9830 | |
| breech bore field reject gage | 7274761 | 4933-647-3697<br>5220-00-647-3697 | limit 0.310 ", marked top line - RIFLE 7.62 MM, M14 second line - BREECHBORE |
| field test gage bolt | 7274799 | 4933-647-3699<br>5220-00-647-3699 | 0.615 " right lug, 0.575 " left lug |
| head space field reject gage | 7274790 | 4933-647-3698<br>5220-00-647-3698 | limit 1.6455 " |
| gas piston snap gage | 7274757 | 4933-647-3695<br>5220-00-647-3695 | NO-GO, 0.4968 " piston diameter |
| gas cylinder plug gage | 7274755 | 4933-647-3693<br>5220-00-647-3693 | NO-GO, 0.5009 " piston hole diameter |
| firing pin protrusion gage | 7274736 | 4933-345-6122<br>5220-00-345-6122 | 0.044 " minimum, 0.060 " maximum |
| firing pin hole plug gage | 7458406 | 4933-917-1067<br>5220-00-917-1067 | NO-GO, 0.083 " maximum |
| flash suppressor alignment tool | 7799705 | 4933-856-2561<br>4933-00-856-2561 | |
| flash suppressor nut pliers | 7790493 | 4933-690-3497<br>5120-00-690-3497 | |

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|---|---|---|---|
| bolt roller retaining ring pliers | 7799723 | 4933-563-0436<br>5120-00-563-0436 | |
| hex head wrench, 7/64 ” | | 5120-889-2162<br>5120-00-889-2162 | for late front sight screw part number 11010298 |
| head space gages | | 5220-00-921-6054 | set of nine gages, 1.630 " to 1.638 ", USMC M14 DMR |
| 3/8 " combination open end and socket end wrench | | | USMC M14 DMR |
| gas cylinder lock tool (wrench) | | | locally fabricated, USMC M14 DMR intermediate level item |
| Dremel Moto-Tool kit | | 5120-01-014-6856 | USMC M14 DMR |
| test fixture, measuring, trigger pull | 7274758 | 4933-00-647-3696 | USMC M14 DMR |

**Table 55: General Support (Depot) Maintenance Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| bolt assembly and disassembly tool | 7144859 | 4933-00-714-4859 | M1 tool adapted to the M14 |
| bolt assembly and disassembly tool | 7791607 | 4933-00-055-5996 | M1 and M14 variants, organizational and intermediate level item for the USMC M14 DMR |

| | | | |
|---|---|---|---|
| small arms shop set | | 4933-754-0664<br>4933-00-754-0664 | reference<br>SM 9-4-4933-A13 |
| small arms repairman's tool kit | | 5180-754-0640 | pre-'62 tool kit |
| small arms repairman's tool kit | | 4933-357-7770<br>5180-00-357-7770 | twenty-seven items added to 5180-754-0640, adopted January 1962, reference<br>SM 9-4-5180-A57 |
| tool set, direct and general support maintenance, basic small arms | 8426358 | 4933-775-0366<br>1015-00-775-0366 | reference<br>SM 9-4-4933-E04 |
| tool set, depot maintenance | 8432422 | 4933-930-5598 | 7.62 MM Rifle, M14 Series |
| head space gage | 7274780 | 4933-916-9271<br>5220-00-916-9271 | 1.6355 " |
| head space gage | 7274782 | 4933-916-9275<br>5220-00-916-9275 | 1.6375 " |
| head space gage | 7274786 | 4933-069-8676<br>5220-00-069-8676 | 1.6415 " |
| head space reamer assembly | 24-013863 | 4933-809-7980 | |
| head space reamer assembly crank handle | 10-013069 | 4933-105-2835 | |
| barrel and receiver assembly disassembling fixture | 10-013027 | 4933-439-6089 | |

| | | | |
|---|---|---|---|
| bolt and roller assembly grease fitting adapter | 10-013635 | 4933-450-6725<br>4933-00-450-6725 | |
| bolt and roller assembly assembling and disassembling fixture | 10-016057 | 4933-439-6088<br>4933-00-439-6088 | |
| firing mechanism assembling fixture | 443448 | 4933-439-6090<br>4933-00-439-6090 | |
| gas cylinder piston hole plug gage | 8440826 | 5220-437-1152<br>5220-00-437-1152 | NO-GO, 0.5009 " piston hole diameter |
| gas port alignment plug gage | 11015316 | 4933-916-9188<br>5220-00-916-9188 | |
| bore straightness drop plug gage | 11015416 | 4933-916-9189<br>5220-00-916-9189 | |
| targeting jack gage | 6511841 | 4933-916-9193<br>4993-00-916-9193 | |
| GO relationship of storage holes to butt plate plug gage | 7271641 | 4933-916-9194<br>5220-00-916-9194 | |
| torque testing gage | 7271792 | 4933-916-9196<br>5220-00-916-9196 | |
| receiver and trigger housing clamping surfaces flush pin gage | 7799742 | 4933-916-9341<br>5220-00-916-9341 | |
| operating rod spring length gage | 7799743 | 4933-916-9360<br>5220-00-916-9360 | |
| extractor assembly length gage | 7799744 | 4933-916-9362<br>6695-00-916-9362 | |

| | | | |
|---|---|---|---|
| ejector assembly length gage | 7799745 | 4933-916-9365<br>5220-00-916-9365 | |
| hammer spring length gage | 7799747 | 4933-916-9444<br>5220-00-916-9444 | |
| rear sight aperture length gage | 7799746 | 4933-916-9437<br>5220-00-916-9437 | |
| connector assembly straightness gage | 7799748 | 4933-916-9464<br>5220-00-916-9464 | |
| barrel alignment gage | 7799749 | 4933-916-9468<br>6695-00-916-9468 | |
| selector slot location gage | 7799750 | 4933-916-9487<br>5220-00-916-9487 | |
| firing pin intrusion flush pin gage | 7799751 | 4933-916-9527<br>5220-00-916-9527 | |
| adjustment snap gage | 7479462 | 4933-917-1068<br>5220-00-917-1068 | MIL-STD-118 |
| barrel and receiver assembling fixture | 7799718 | 4933-937-4068<br>4933-00-937-4068 | |
| fixed open end wrench | 10-012952 | 5120-156-8735<br>5120-00-156-8735 | |
| facing cutter | 7799721 | 4933-937-4069<br>5110-00-937-4069 | |
| bolt face firing pin hole plain cylindrical plug gage | 7458398 | 5220-745-8398<br>5220-00-745-8398 | NO-GO, 0.083 " maximum diameter, MIL-STD-111 |
| chamfer tool (field) | 7799719 | 5220-00-937-4536 | also known as a profile gage |

| | | | |
|---|---|---|---|
| proof firing cover | 7273975 | 4933-838-5472 | for depot rebuild program only |
| firing stand | 7273901 | 4933-916-9207<br>4933-00-916-9207 | for depot rebuild program only |
| target, 1000 inch | 8448435 | 6920-240-9349 | roll of 500 |
| target, M14 rifle | 11686842 | 6920-021-2477 | for depot rebuild program only, roll of 500 targets per box, original drawing dated November 1966 |
| adjustable base assembly | 7692125 | | support level not available |
| timer cycle gage | 7273920 | | support level not available |
| trigger pull gage | 7274758 | 4933-00-647-3696 | support level not available |
| bolt lock pin removal tool | improvised | | see drawing at TM 9-1005-223-35 July 1968 page 6 |
| flash suppressor seating tool | improvised | | see drawing at TM 9-1005-223-35 July 1968 page 7 |
| stock liner screw wrench | improvised | | |
| M15 grenade launcher sight drill jig | improvised | | see drawing at TM 9-1005-223-35 July 1968 page 7, use mild steel or aluminum |
| firing mechanism assembly and disassembly fixture | improvised | | |

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|---|---|---|---|
| protector, rear sight | 7791358 | 1005-00-441-8807 | |
| protector, operating rod handle | 7790231 | 1005-00-875-9765 | |
| protector, muzzle | 7790232 | 1005-00-875-9766 | |

**Table 56: Procurement Substitutions - Interchangeable Items**

| Description | FSN or NSN | Identical to the M14 item? | Comments |
|---|---|---|---|
| M1 elevation pinion assembly | | not suitable | early style with small screw and smooth face marked battle range |
| M1 elevation pinion assembly | 1005-731-2738 | no but suitable | calibrated in yards |
| M1 windage knob | | not suitable | early style with winged lock nut |
| M1 windage knob | 1005-731-2737 | yes | original drawing dated December 1944 |
| M1 rear sight aperture | 1005-600-8868 | yes | original drawing dated August 1937 |
| M1 rear sight cover | 1005-600-8872 | yes | original drawing dated August 1937 |
| M1 rear sight base | 1005-564-6001 | yes | original drawing dated August 1937 |
| M1 extractor | 1005-554-6003 | no but suitable | early M14 extractor |

| | | | |
|---|---|---|---|
| M1 extractor spring w/plunger | 1005-600-8618 | yes | original drawing dated August 1937 |
| M1 trigger pin | 5315-501-3669 | no but suitable | early M14 trigger pin |
| M1 trigger pin | 1005-819-4501 | yes | on 1964 DCM list |
| M1 trigger and sear assembly | 1005-554-6026 | no but suitable | for semi-automatic fire only |
| M1 sear | | no but suitable | for semi-automatic fire only |
| M1 sear pin | | yes | original drawing dated August 1937 |
| M1 trigger | | yes | original drawing dated August 1937 |
| M1 hammer spring housing | 1005-600-8883 | yes | original drawing dated August 1937 |
| M1 hammer spring | 1005-600-8887 | yes | original drawing dated August 1937 |
| M1 hammer spring plunger | 1005-600-8880 | yes | original drawing dated August 1937 |
| M1 hammer pin | 5315-501-3668 | yes | original drawing dated August 1937 |
| M1 hammer | | dimensionally identical | World War II production marked C46008, original drawing dated August 1937 |
| M1 hammer | 1005-554-6008 | dimensionally identical | 1950s production marked D5546008, original drawing dated August 1937 |
| M1 safety | 1005-554-6015 | yes | original drawing dated April 1937 |
| M1 hand guard band | | yes | original drawing dated August 1937 |
| M1 lower butt stock screw | 5305-600-8881 | yes | original drawing dated August 1937 |

| | | | |
|---|---|---|---|
| M1 butt stock sling swivel | 1005-600-8889 | yes | original drawing dated August 1937 |
| M1 small butt plate screw | 1005-614-6873 | early M14 and M14A1 | also available from M1903, can be used on standard M14 stock by plugging hole, original drawing dated March 1935 |
| M1 butt plate assembly | 1005-556-4277 | early M14 only | can be used on standard M14 by using hinge transition piece 7790914 or equivalent |
| NM front sight | | | marked NM 062, original drawing dated November 1961 |
| NM rear sight base | 1005-875-6281 | yes | marked NM/2, original drawing dated December 1961 |
| NM rear sight base | 1005-754-6799 | yes | marked NM/2A, original drawing dated November 1963 |
| NM windage knob | 1005-649-9275 | yes | original drawing dated November 1958 |
| hooded rear sight aperture | 1005-864-2926 | yes | 0.0595 " diameter |
| hooded rear sight aperture | 1005-864-2928 | yes | 0.0520 " diameter |
| NM rear sight aperture | 1005-348-8654 | yes | 0.0595 " diameter, part number 7268109 |
| NM rear sight aperture | 1005-348-8655 | yes | 0.0520 " diameter, part number 7268110 |

| | | | |
|---|---|---|---|
| M1907 leather sling | 1005-00-714-1245 | yes | series of original drawings dated November 1950, part number 7141245 |
| small arms sling, cotton web | 1005-00-654-4058 | yes | olive drab, last contract circa 1966, part number 6544068 |
| small arms sling, hard nylon weave | 1005-00-714-5320 | no but suitable | issued for use in the Republic of Viet Nam, introduced about 1969, part number 7145320 |
| small arms sling, soft nylon weave | 1005-00-167-4336 | no but suitable | first produced in 1973, part number 8448770 |
| small arms sling | 1005-01-216-4510 | no but suitable | originally dated January 1986, part number 12624561 |
| M1 rifle cleaning rod case | 1005-716-2792 | no | M1 case made of light cloth with integral tab, M14 case of heavy cloth with sewn on tab |
| M10 cleaning rod handle assembly | | no | part number 7266115 |
| M10 cleaning rod section | | yes | drawing number D7162920 |
| bore brush | 1005-556-4174 | yes | drawing number C5564174 |
| swab holder | | yes | |
| barrel reflector | 4933-726-5788 | no | |
| M15 grenade launcher sight drill jig | 1005-00-731-0066 | no | part number 7310066, M1903 and M1 rifles, the jig holes are located too high for the M14 |
| M1 stock ferrule sling swivel | 1005-600-8890 | M14A1 only | |

**Table 57: Accessories for Various USGI M14 Rifles**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| bipod | 98003A2200 | 1005-01-472-3902 | M14 DMR, Harris Bipods, model S-L |
| bipod | | 1005-01-511-7758 | M39 EMR, Harris Bipods, model S-BRM |
| bipod | | | Mk 14 Mod 0, Harris Bipods model 1A2-BRM |
| bipod adaptor plate | 98060 | 1005-01-468-0350 | M39 EMR and Mk 14 Mod 0, Knights Armament |
| bipod lock | 875 | 1005-01-511-9944 | M39 EMR, Kisatchie Machine Works |
| cartridge clip (stripper clip) | 7790130 | 1305-00-914-7912 | M14, M14A1, five round capacity, originally drawn January 1958 |
| cartridge clip spring | 7790131 | | |
| cartridge clip shoe | 7790132 | | |
| chamber brush | 7790463 | 1005-633-7165<br>1005-690-8441<br>1005-00-690-8441 | The FSN was changed between 1960 and January 1963 but the reason is not known.  The part number did not change. |

| | | | |
|---|---|---|---|
| cleaning kit | 308-6 | 1005-01-451-5119 | M14 DMR, M39 EMR and Mk 14 Mod 0, Otis Products, Inc. |
| bore snake, .30 caliber | | | Mk 14 Mod 0, Hoppes |
| cleaning rod case with spacer | 7267754 | 1005-650-4510 1005-00-650-4510 | cloth case with sewn on tab |
| cleaning rod section | 7266109 | 1005-726-6109 1005-00-726-6109 | four required |
| cleaning rod swab holder | 7266110 | 1005-726-6110 1005-00-726-6110 | 3.5 " overall length |
| Mk 14 EBR tool | | MSC | Bondhus/MSC, 67255281 |
| combination tool with cleaning rod | 7790769 | 4933-00-768-0211 | FSN listed as 4933-768-2011 in TM 9-1005-223-34 |
| gas cylinder plug wrench | 7267693 | | pre-'61 cleaning kit item, 3/8 " box end twelve point, 2 5/8 " overall length, 15 degree offset handle |
| combination tool | | | pre-'61 cleaning kit item, three pieces |
| oiler case | | | pre-'61 cleaning kit item |
| grease cup | | | pre-'61 cleaning kit item |
| chamber brush | 7267713 | | pre-'61 cleaning kit item, no ratchet mechanism |
| M1 cleaning kit case | 7162792 | 1005-716-2792 1005-00-716-2792 | lighter cloth material than 7267754 and has an integral tab |

| | | | |
|---|---|---|---|
| cleaning rod swab holder | 6147417 | 1005-614-7417<br>1005-00-614-7417 | pre-'61 cleaning kit item, 3 " |
| lubricant case | 7790995 | 1005-791-3377<br>1005-00-791-3377 | two compartment plastic case |
| magazine filler (late version) | 7791154 | 1005-00-052-4336 | commonly known as magazine charger guide, original drawing dated February 1961 |
| M2 bandoleer | | 1305-00-984-1125 | M14, M14A1 |
| M3 bipod with carrying case | 8445081 | 1005-890-2609<br>1005-00-8902609 | M16 accessories |
| M3 bipod | 8448457 | 1005-992-6676<br>1005-00-992-6676 | M16 accessory, sometimes used on the M14 in the Republic of Viet Nam, Colt Industries part number 62122 |
| M3 bipod carrying case | 2-2-246 | 1005-999-2430<br>3040-00-999-2430 | |
| M3 breech shield | 7790929 | | |
| M5 winter trigger kit | 5910520 | 1005-777-1369<br>1005-00-777-1369 | M14 |
| M5 winter trigger assembly | 7790808 | 1005-775-0364<br>1005-00-775-0364 | M14, original drawing dated May 15, 1961 |
| M5 winter trigger cam | 7791209 | | |
| M5 winter trigger hinge | 7791212 | | |
| M5 winter trigger pin | 7791208 | | two required |
| M6 bayonet | 7267616 | 1005-00-722-3097 | original drawing dated January 24, 1955 |
| M6 bayonet with M10 scabbard | 8427015 | 1005-00-014-0369 | original drawing dated February 25, 1964 |

| | | | |
|---|---|---|---|
| M6 bayonet blade assembly | 7267649 | | original drawing dated January 24, 1955 |
| M6 bayonet left track | 7267647 | | |
| M6 bayonet right track | 7267646 | | |
| M6 bayonet blade | 7267650 | | |
| M6 bayonet wedge | 7266544 | | two required |
| M6 bayonet track rivet | 7266542 | | two required |
| M6 bayonet guard | 7267651 | | |
| M6 bayonet sleeve | 7266541 | | |
| M6 bayonet plate | 7266538 | | |
| M6 bayonet spring | 7267645 | | original drawing dated January 24, 1955, steel music wire per QQ-W-470, conical compression, 8.5 coils, 0.55 " free length, plain ends, right hand or left hand twist |
| M6 bayonet latching lever | 7267648 | | original drawing dated January 24, 1955, AISI 1060 carbon steel per QQ-S-640 |
| M6 bayonet pin | 586077 | | early version |
| M6 bayonet pin | MS 16562-125 | 5315-00-058-6077 | late version |
| M6 bayonet right side grip | 7267652 | 1005-333-3577<br>1005-00-333-3577 | original drawing dated January 24, 1955, thermosetting molding plastic, semi-dull black |

| | | | |
|---|---|---|---|
| M6 bayonet left side grip | 7267653 | 1005-333-3578<br>1005-00-333-3578 | original drawing dated January 24, 1955, thermosetting molding plastic, semi-dull black |
| M6 bayonet screw | 7266548 | 5305-00-726-6548 | two required, early version |
| M6 bayonet screw | 11010078 | 5305-00-051-3609 | original drawing dated December 06, 1963, two required, late version, effective with D7267616 Revision F dated December 1969, 6-32 UNC-2A x 0.75 " long, interchangeable with M4, M5, M5A1 and M7 bayonet screw |
| M8A1 scabbard | 7268112 | 1095-00-508-0339 | |
| M8A1 scabbard restraining lace | 7267136 | 1005-300-5378<br>1005-00-300-5378 | |
| M10 scabbard | 8448476 | 1095-00-223-7164 | |
| M11 small arms storage rack | 8429990 | 1095-00-897-8755 | original drawing dated October 1961, M1 and M14 rifles |
| M12 blank firing kit | 5910570 | 1005-00-893-0902 | |
| M12 blank firing attachment | 7793000 | | third version |
| M14DC sound suppressor | | 1005-LL-L99-7965 (October 2006 NSN from the U. S. Navy | supplied by Smith Enterprise, Inc. |
| Mk 14 Mod 1 sound suppressor | | | U. S. Navy issue, supplied by Surefire, LLC |
| M15 grenade launcher sight | 5750053 | 1005-049-9428<br>1005-00-344-6156 | |

| | | | |
|---|---|---|---|
| M15 sight body | 7310096 | | |
| M15 sight level assembly | 7310097 | | |
| M15 sight level assembly screw | 7310093 | | two required |
| M15 sight bracket screw | 7310095 | | two required |
| M15 sight stock plate | 7311859 | | |
| M15 sight tapping screw | 7310009 | | two required |
| M15 grenade launcher sight carry case | 7160198 | 1005-716-0198<br>1005-00-716-0198 | canvas pouch with two snap buttons |
| T140 and M76 grenade launcher | 7267617 | 1005-722-3098<br>1005-00-722-3098 | M14,<br>MIL-STD-1266 dated March 23, 1961 |
| M76 grenade launcher with equipment | 5910536 | 1005-778-8812<br>1005-00-778-8812 | M14 |
| M151 vehicle mounting kit | | 2590-045-9611 (cancelled) | early version for M14 rifle |
| M151 vehicle mounting kit | 11630529 | 2540-763-7348<br>1095-00-763-7348 | late version for M14 and M16 rifles |
| XM152 winter trigger assembly | 11010283 | 1005-919-9915 | |
| M35 truck dual rifle mounting kit | 12301044 | 2540-01-223-0041 | M14 or M16 |
| muzzle stabilizer assembly | | | M14 (USAIB) only, 1962 design, first version |
| muzzle stabilizer assembly | 7791661 | 1005-072-5382 | M14E2, original drawing dated September 1963, second version |
| muzzle stabilizer assembly | 11686521 | 1005-930-0806<br>1005-00-930-0806 | M14A1, original drawing dated April 1966, final version |

| | | | |
|---|---|---|---|
| muzzle stabilizer yoke pin | 7791664 | 5315-929-0862<br>5315-00-929-0862 | |
| muzzle stabilizer yoke washer | 7791668 | 5310-962-0873<br>5310-00-962-0873 | 0.098 " ID x 0.315 " OD x 0.060 " thick flat washer |
| muzzle stabilizer yoke assembly | 11686520 | 1005-951-3232<br>1005-00-951-3232 | |
| muzzle stabilizer yoke screw | 11686519 | 5305-956-3127<br>5306-00-956-3127 | ¼ " diameter - 28 UNF x 1.215 " long hex head bolt |
| muzzle stabilizer yoke nut | 7791663 | 5310-953-6340<br>5310-00-953-6340 | ¼ " diameter - 28 UNF x 0.270 " thick hex nut |
| muzzle stabilizer yoke | 11686517 | | |
| muzzle stabilizer stop | 11686518 | 1005-951-3056<br>1005-00-951-3056 | |
| muzzle stabilizer | 7791667 | | |
| rifle carrier | | 8465-782-2799 | nylon webbing carrier to attach a M14 rifle to an ALICE ruck sack, U. S. Army Quartermaster Corps item |
| M84 scope carrying case | 7631596 | 1240-00-763-1596 | marked MRT on the inside of the flap |
| ART scope carrying case | 11729637 | 1240-179-4192 | waterproof alloy aluminum or fiberglass container |
| AN/PAS-4 scope | | 1090-797-8217<br>5855-00-797-8217 | Varo model 9903, 4.5 X, total weight 13 pounds |
| AN/PAS-4 scope | | 1090-990-0701<br>5855-00-990-0701 | Polan Industries model P-155, 4.5X, total weight 13 pounds |

| | | | |
|---|---|---|---|
| AN/PVS-1 scope | | 5855-087-2942<br>5855-00-087-2942 | 4X magnification, 18.5 " long, 3.375 " wide, weight 6 pounds |
| AN/PVS-2 scope | | 5855-832-9223<br>5855-00-832-9223 | 4X magnification, 17.5 " long, 3.5 " wide, weight 6 pounds, AN/PVS-2A and AN/PVS-2B models were also fielded, -2B model features automatic control for light brightness |
| AN/PVS-3 scope | | 5855-832-9341<br>5855-00-832-9341 | 4X magnification, 13.5 " long, 3.5 " wide, 5.75 " high, weight 3 pounds, automatic light brightness control |
| AN/PVS-3A scope | | 5855-156-4992<br>5855-00-156-4992 | 4X magnification, automatic light brightness control |
| AN/PVS-4 scope | | 5855-00-629-5334 | 4X magnification, 9.5 " long, 4.5 " wide, 3.8 pounds weight |
| AN/PVS-4 carrying case | | 5855-00-832-6525 | |
| AN/PAQ-4 infrared aiming light | | 5855-01-107-5925 | Mk 14 Mod 0 |
| AN/PAQ-4A infrared aiming light | | 5855-01-312-5160 | Mk 14 Mod 0 |
| AN/PAQ-4B infrared aiming light | | 5855-01-361-1362 | Mk 14 Mod 0 |
| AN/PAQ-4C infrared aiming light | | 5855-01-398-4315 | Mk 14 Mod 0 |
| AN/PEQ-2A target illuminator | | 5855-01-447-8992 | Mk 14 Mod 0 |
| AN/PVS-10 day and night scope | | 5855-01-410-8979 | M14 DMR |

| | | | |
|---|---|---|---|
| AN/PVS-14 night scope | | 5855-01-432-0524 | |
| AN/PVS-22 night scope | | | M14SE, Smith Enterprise, Inc. part number 2009 |
| optical scope (sight, telescopic) | 9349352 | | M21, original drawing dated November 1981 |
| optical scope | 98003A0020 | 1240-01-470-6548 | M14 DMR, 10X |
| optical scope | PRM8541 | 1240-01-533-1854 | M39 EMR, Premier Reticles |
| scope mount | | 1240-01-316-0055 | Atlantic Research Marketing Systems, Inc. # 18, MIL-STD-1913 |
| scope mount | | 5855-01-506-5750 | Smith Enterprise, Inc., part number 2006, MIL-STD-1913, 5.38 " long |
| scope mount | | 1005-01-533-8160 | Smith Enterprise, Inc., part number 2008, MIL-STD-1913, 7.0 " long |
| scope mount | | 1005-01-535-4430 | Smith Enterprise, Inc., part number 2005, MIL-STD-1913, Trijicon, Inc. sight compatible |
| scope mount | 98003A1100 | 1005-01-556-7363 | M39 EMR, optical platform interface |
| scope ring (assembly, ring, telescopic sight) | 98003A0030 | 1005-01-470-7458 | M14 DMR, Badger Ordnance, two required |
| scope ring, sniper rifle | 306-24 | 5365-01-511-9954 | M39 EMR, Badger Ordnance, two required |

| | | | |
|---|---|---|---|
| scope ring screw (screw, cap) | MS 16995-18B | 5305-00-145-0713 | M14 DMR, eight required, M39 EMR, ten required |
| scope ring upper half (cap, ring) | 98003A0033 | 1005-01-470-9060 | M14 DMR and M39 EMR, two required |
| scope ring lower half (ring, base) | 98003A0031 | 1005-01-470-9065 | M14 DMR and M39 EMR, two required |
| scope ring nut | 98003A0036 | 5310-01-147-2385 | M14 DMR and M39 EMR, two required |
| scope ring washer | DOD-W-63474/3 | 5310-01-360-4766 | M14 DMR and M39 EMR, two required |
| scope ring clamp | 98003A0034 | 1005-01-470-9595 | M14 DMR and M39 EMR, two required |
| sling, rifle | | | Mk 14 Mod 0, Buffer Technologies item TAS-M14 |
| storage case | | | Mk 14 Mod 0, Eagle Industries model DCM14 |
| weapons record book | | 0000-00-005-9811 | Mk 14 Mod 0 |
| XM152 winter trigger kit | 5910322 | | M14A1 only |

**Table 58: Repair Items**

| Description | Part Number | FSN or NSN | Comments |
|---|---|---|---|
| combination tool spring pin | MS 16562-98 | 5315-597-5086<br>5315-00-597-5086 | 1/16 " diameter x 3/8 " long |
| combination tool screwdriver blade | 7790786 | 4922-780-1982<br>5120-00-780-1982 | 0.220 " wide x 0.527 " long |
| enamel, walnut stock touch up | | 8010-145-0042<br>8010-00-145-0042 | number 21089, 1 gallon can |

| | | | |
|---|---|---|---|
| M5 winter trigger kit screw | 7791231 | | two required, wood screw with partially threaded shaft,<br>TM 9-1005-223-12 January 1963 |
| M5 winter trigger kit thread forming tapping screw | 7791415 | 5305-990-6435<br>5305-00-990-6435 | two required, wood screw with fully threaded shaft,<br>TM 9-1005-223-34 August 1972 |
| M5 winter trigger kit retaining hinge washer | 7791237 | 1005-010-5022<br>5340-00-010-5022 | |
| M5 winter trigger kit lever | 7791211 | | |
| M5 winter trigger kit safety | 7790903 | 1005-778-0580<br>1005-00-778-0580 | |
| stock repair screw, large | 5233523 | 5315-523-3523<br>5315-00-523-3523 | half-hard brass, 3/32 " diameter x 2 7/16 " long, for repair of wood stock FSN 1005-754-6462 |
| stock repair screw, small | 7190954 | 5315-719-0954<br>5315-00-719-0954 | half-hard brass, 1/16 " diameter x 2 " long, for repair of wood stock FSN 1005-754-6462 |

# Appendix C

**M14 Magazine Capacity Restrictions**

The following table is an *informative guide* to state and local jurisdictions in the United States of America that restrict possession, sales or transfer of M14 magazines in some manner. Obviously, any changes in the laws restricting magazine capacity degrade the usefulness of this table. This table does not address any restrictions on handgun magazines, shotgun capacity, rimfire ammunition feeding device capacity or belt fed firearm feeding device capacity. The author has made reasonable effort to be thorough and accurate but the information cannot be guaranteed. The U. S. Department of Justice BATFE Publication P5300.5 26$^{th}$ Edition is a very good reference on firearms laws. However, even that publication is incomplete. It does not contain the firearms ordinances, including the magazine capacity restrictions, for Cicero, Franklin Park, and Oak Park, Illinois and Philadelphia, Pennsylvania.

Disclaimer: Firearms owners are responsible for their actions. If you are unsure of the law, consult the local law enforcement agency and/or an attorney knowledgeable in firearms laws. This is not legal advice. Consult an attorney for any legal matter.

**Table 59: M14 Magazine Capacity Restrictions in the USA**

| Jurisdiction | Centerfire Rifle Magazine Capacity Prohibited |
|---|---|
| California | > 10 rounds possessed after January 01, 2000 |
| District of Columbia | semi-automatic firearm with a magazine > 12 rounds capacity is defined as a machine gun and thus prohibited |
| Aurora, Illinois | > 15 rounds |
| Chicago, Illinois | > 12 rounds |
| Cicero, Illinois | > 15 rounds |
| Franklin Park, Illinois | > 16 rounds |
| Oak Park, Illinois | > 10 rounds |
| South Bend, Indiana | > 15 rounds |

| | |
|---|---|
| Maryland | > 20 rounds |
| Massachusetts | > 10 rounds made after September 13, 1994 |
| Boston, Massachusetts | > 10 rounds |
| New Jersey | > 15 rounds |
| New York | > 10 rounds made after September 13, 1994 |
| Buffalo, New York | > 5 rounds |
| New York City, New York | > 5 rounds |
| Rochester, New York | > 5 rounds |
| Ohio | > 30 rounds when inserted into a rifle |
| Philadelphia, Pennsylvania | > 10 rounds |

# Appendix D

**T44E4 Rifle and Accessory Information**

The U. S. Army Ordnance Corps at Raritan Arsenal promulgated an Instructor Guide on the M14 (T44E4) Rifle on January 02, 1958. This guide, CMT-IG Number 38 Notes on Rifle Caliber 7.62MM M14 (T44E4), included physical data, a general description and a list of T44E4 parts and required spare parts. M14 parts production did not start until December 1958. Some of the associated drawings, including the M14 receiver, had not yet been drawn. The following is a list of T44E4 parts and the numbers of spare parts for maintenance of 100 rifles from CMT-IG Number 38 and Springfield Armory Notes on Development Type Materiel Report Number SA-NM11-2612 dated June 17, 1955.

**Table 60: T44E4 Rifle Parts and Recommended Spare Parts**

| Ordnance Drawing Number | T44E4 Part Description | Number of Spare Parts for Maintenance of 100 Rifles |
|---|---|---|
| BCTX2.2 (147457) | full dog point set socket screw | 10 |
| BEAX1 (138534) | lock tooth type washer | |
| BFSX2.1 (586045) | selector shaft pin | 2 |
| BFSX2.1 (586062) | spindle valve pin | 50 |
| BFSX2.1 (586064) | spring pin | 2 |
| BFSX2.1 (586072) | bolt lock pin | 10 |
| BFSX2.1 (586081) | magazine latch pin | 9 |
| BFSX2.1 (586085) | pin | 20 |
| BMCX1.3 (135285) | (2) truss head rivet | 10 |
| B5013668 | hammer pin | 4 |
| B5013669 | trigger pin | 4 |
| B5013671 | extractor spring plunger | |

| | | |
|---|---|---|
| A5013673 | sear pin | |
| B5152863 | butt plate plunger spring | |
| B5152864 | butt plate plunger | |
| A5152865 | butt plate cap pin | |
| D5546001 | rear sight base | 2 |
| F5546003 | extractor | 8 |
| D5546020 | trigger | |
| D5564277 | butt plate | |
| D5564283 | butt plate assembly | |
| B6008618 | extractor spring assembly | 15 |
| D6008868 | rear sight aperture | 4 |
| B6008870 | hand guard band (clip) | |
| C6008872 | rear sight cover | 2 |
| B6008880 | hammer spring plunger | 2 |
| C6008881 | long butt plate screw | 2 |
| C6008883 | hammer spring housing | 2 |
| B6008886 | extractor spring | |
| B6008887 | hammer spring | 5 |
| C6008889 | butt swivel | 2 |
| B6146873 | small butt plate screw | 2 |

| | | |
|---|---|---|
| D6147465 | butt plate cap | |
| D7267001 | front band | 5 |
| F7267002 | barrel | 6 |
| F7267003 | bolt body | |
| B7267004 | bolt with roller | 6 |
| D7267005 | bolt assembly | |
| B7267007 | front swivel bracket | |
| D7267011 | connector bar | |
| D7267012 | connector assembly | 8 |
| D7267013 | gas cylinder | 4 |
| C7267014 | ejector | |
| B7267015 | ejector assembly | 12 |
| B7267017 | stock ferrule | |
| D7267018 | magazine follower | |
| C7267019 | magazine follower and stop assembly | |
| D7267020 | hand guard | |
| D7267021 | hand guard assembly | 10 |
| D7267022 | trigger guard | |
| D7267023 | trigger guard and stop assembly | 4 |
| B7267024 | connector spring guide | |

| | | |
|---|---|---|
| C7267025 | operating rod guide | 4 |
| C7267027 | operating rod spring guide | 10 |
| C7267028 | packet charger guide | 2 |
| F7267029 | operating rod handle | |
| F7267030 | trigger housing | |
| D7267031 | trigger and latch housing assembly | 4 |
| C7267032 | magazine latch | 5 |
| C7267033 | stock liner | |
| C7267034 | bolt lock | 5 |
| B7267035 | connector lock | 10 |
| C7267036 | gas cylinder lock | 4 |
| B7267037 | front swivel loop | |
| D7267038 | magazine assembly | 1000 |
| B7267039 | flash suppressor nut | 5 |
| B7267041 | magazine latch spring | 5 |
| B7267042 | connector lock pin | 10 |
| C7267043 | firing pin | 20 |
| D7267047 | gas piston | 4 |
| B7267050 | connector plate | |
| C7267051 | magazine floor plate | |

| | | |
|---|---|---|
| C7267053 | gas cylinder plug | 4 |
| F7267056 | receiver | |
| F7267057 | barrel and receiver assembly | |
| D7267058 | sear release | 5 |
| B7267059 | bolt roller retainer | 10 |
| B7267063 | (2) stock liner screw | 8 |
| D7267064 | operating rod assembly | 8 |
| B7267065 | bolt roller | 10 |
| D7267066 | safety | 2 |
| D7267067 | front sight screw | 2 |
| D7267070 | sear | |
| C7267071 | selector switch | 5 |
| C7267072 | selector shaft | 5 |
| D7267073 | front sight | 2 |
| B7267074 | bolt lock spring | 5 |
| B7267076 | connector spring | |
| C7267078 | magazine spring | |
| B7267079 | operating rod spring | 5 |
| B7267080 | safety spring | 5 |
| B7267081 | selector spring | 5 |

| | | |
|---|---|---|
| F7267083 | stock | |
| F7267084 | stock assembly with butt plate | 10 |
| B7267085 | magazine follower stop | |
| F7267088 | flash suppressor | 5 |
| C7267089 | front swivel assembly | 2 |
| C7267090 | trigger and sear assembly | 4 |
| D7267091 | magazine tube | |
| B7267092 | operating rod tube | |
| C7267172 | selector shaft lock | 5 |
| C7267604 | spindle valve | 5 |
| B7267605 | spindle valve spring | 10 |
| B7267959 | ejector spring | |
| D7267963 | hammer | 4 |
| B7312633 | hammer stop | |
| C7312725 | indexing dog | |
| C7312726 | rear sight nut | |
| B7312727 | dog retainer | |
| B7312728 | rear sight nut retainer | |
| B7312729 | rear sight screw retainer | |
| C7312730 | rear sight screw | 2 |

| | | |
|---|---|---|
| C7312731 | rear sight lock nut | |
| C7312732 | rear sight spring | |
| C7312733 | indexing dog assembly | |
| D7312734 | elevating knob | |
| D7312735 | windage knob | |
| D7312736 | elevating pinion | |
| D7312737 | windage knob assembly | 4 |
| D7312738 | elevating pinion assembly | 4 |

**Table 61: T12 Bayonet Parts**

| Part Name | Drawing Number |
|---|---|
| blade assembly | C7267649 |
| lever | D7267648 |
| pin | BFSX 2.1 (586077) |
| grip, left hand | D7267653 |
| grip, right hand | D7267652 |
| screw (two required) | A7266548 |
| spring | B7267645 |

**Table 62: T140 and M76 Grenade Launcher Parts**

| Part Name | Drawing Number |
|---|---|
| grenade launcher assembly, T140 and M76 | F7267617 |
| sleeve spring, T140 | B7267659 |
| handle, T140 or tube and hinge assembly, M76 | C7267660 |
| plunger, T140 and M76 | C7267661 |
| sleeve assembly, T140 | C7267666 |
| long (hinge) pin, T140 | B7267669 |
| latch spring, T140 and M76 | B7267691 |
| short (latch) pin, T140 | B7267692 |
| latching handle assembly, M76 | C7790900 |
| short (latch) pin, M76 | MS 16562-96 |

**Table 63: T6 Auxiliary Winter Trigger Parts**

| Part Name | Drawing Number |
|---|---|
| actuator assembly | B7267640 |
| lever | D7267643 |
| support | C7267639 |
| spring | C7267638 |
| pivot | B7267637 |

| | |
|---|---|
| winter trigger assembly | |

**Table 64: T44E5 Rifle Parts and Recommended Spare Parts**

| Ordnance Drawing Number | T44E5 Part Description | Number of Spare Parts for Maintenance of 100 Rifles |
|---|---|---|
| D6008869 | rear sight aperture | 4 |
| SA-C-24043 | front band | 5 |
| SA-F-34831 | barrel | 6 |
| C7267028 | packet charger guide | 2 |
| B7267035 | connector lock | 10 |
| B7267042 | connector lock pin | 10 |
| BFXS2.1 (586064) | spring pin | 2 |
| F7267056 | receiver | |
| D5546001 | rear sight base | 2 |
| D7267005 | bolt assembly | |
| D7267004 | bolt and roller assembly | 6 |
| F7267003 | bolt | |
| B7267059 | bolt roller retainer | 10 |
| B7267065 | bolt roller | 10 |
| B7267015 | cartridge ejector assembly | 12 |
| C7267014 | cartridge ejector | |

| | | |
|---|---|---|
| B7267077 | cartridge ejector spring | |
| F5546003 | extractor | 8 |
| C7267043 | firing pin | 20 |
| B6008618 | extractor spring and plunger assembly | 15 |
| B5013671 | extractor spring plunger | |
| B6008886 | extractor spring | |
| D7267012 | connector assembly | 8 |
| D7267011 | connector bar | |
| D7267024 | connector spring guide | |
| B7267050 | connector plate | |
| B7267076 | connector spring | |
| C6008872 | rear sight cover | 2 |
| SA-C-24048 | gas cylinder | 4 |
| | hand guard and band assembly | 10 |
| B6008870 | rear hand guard band | |
| SA-C-24050 | hand guard | |
| D7267023 | trigger and stop guard assembly | 4 |
| D7267022 | trigger guard | |
| B7312633 | hammer stop | |

| | | |
|---|---|---|
| SA-B-34122 | operating rod guide | 4 |
| C7267027 | operating rod spring guide | 10 |
| D5546008 | hammer | 4 |
| C6008883 | hammer spring housing | 2 |
| D7267031 | trigger and latch housing assembly | 4 |
| F7267030 | trigger housing | |
| C7267032 | magazine latch | 5 |
| BFSX2.1 (586081) | spring pin | 9 |
| B7267041 | magazine latch spring | 5 |
| D7312737 | rear sight windage knob assembly | 4 |
| D7312735 | rear sight windage knob | |
| C7312731 | rear sight lock nut | |
| C7312726 | rear sight nut | |
| B7312728 | rear sight nut retainer | |
| C7267034 | bolt lock | 5 |
| SA-B-24054 | gas cylinder lock | 4 |
| C7267172 | selector shaft lock | 5 |
| D7267038 | magazine assembly | 1000 |
| C7267019 | magazine and stop follower assembly | |

| | | |
|---|---|---|
| D7267018 | magazine follower | |
| B7267085 | follower stop | |
| C7267051 | magazine floor plate | |
| C7267078 | magazine spring | |
| D7267091 | magazine tube | |
| SA-B-31699 | stabilizer nut | 5 |
| B5013668 | hammer pin | 4 |
| BFSX2.1 (586072) | spring pin | 10 |
| BFSX2.1 (586045) | spring pin | 2 |
| BFSX2.1 (586070) | spring pin | 20 |
| B5013669 | trigger pin | 4 |
| D7312738 | rear sight elevating pinion assembly | 4 |
| C7312733 | indexing dog assembly | |
| C7312725 | indexing dog | |
| B7312729 | rear sight screw retainer | |
| C7312730 | rear sight screw | 2 |
| BEAX1 (138534) | lock tooth type washer | |
| D7312734 | rear sight elevating knob | |
| D7312736 | rear sight elevating pinion | |
| D7312727 | dog retainer | |

| | | |
|---|---|---|
| D7312732 | rear sight spring | |
| D7267047 | piston | 4 |
| C7267053 | gas cylinder plug | 4 |
| B6008880 | hammer spring plunger | 2 |
| D7267058 | sear release | 5 |
| D7267064 | operating rod assembly | 8 |
| F7267029 | operating rod handle | |
| B7267092 | operating rod tube | |
| D7267066 | safety | 2 |
| D7267067 | front sight screw | 2 |
| SA-B-31946 | stabilizer nut lock screw | 10 |
| C7267071 | selector | 5 |
| C7267072 | selector shaft | 5 |
| D7267073 | front sight | 2 |
| B7267074 | bolt lock spring | 5 |
| B6008887 | hammer spring | 4 |
| B7267079 | operating rod spring | 5 |
| B7267080 | safety spring | 5 |
| B7267081 | selector spring | 5 |
| SA-F-33598 | heavy barrel stock assembly | 10 |

| | | |
|---|---|---|
| SA-A-24049 | stock ferrule | |
| SA-C-34120 | stock liner | |
| SA-D-32057 | butt hinge plate assembly | |
| D6147465 | butt plate cap | |
| A5152865 | butt plate cap pin | |
| SA-C-32056 | butt plate assembly | |
| B5152864 | butt plate plunger | |
| B5152863 | butt plate plunger spring | |
| SA-C-32055 | shoulder rest plate | |
| SA-A-33364 | shoulder rest hinge pin | |
| CCAX1 (104918) | ball | |
| SA-A-33974 | setscrew | |
| A5013747 | shoulder rest spring | |
| C6008881 | long butt plate screw | 2 |
| B6146873 | small butt plate screw | 2 |
| C6008889 | butt swivel | 2 |
| BMCX1.3 (106886) | truss head rivet | 10 |
| SA-B-38554 | left side stock screw | 4 |
| SA-B-38555 | right side stock screw | 4 |
| SA-F-34119 | stock | |

| | | |
|---|---|---|
| C7267089 | front swivel assembly | 2 |
| B7267007 | front swivel bracket | |
| B7267037 | front swivel loop | |
| SA-D-31921 | flash suppressor | 5 |
| C7267090 | trigger and sear assembly | 4 |
| A5013673 | sear pin | |
| D7267070 | sear | |
| D5546020 | trigger | |

# Appendix E

**M14 Rifle Spare Parts Allowance for 100 Rifles**

U. S. Army Technical Manual 9-1005-223-35 July 1968 lists the maximum parts quantity allowed at the Direct Support (DS), General Support (GS) and Depot Maintenance levels.

**Table 65: M14 Rifle Spare Parts Allowance for 100 Rifles**

| M14 Rifle Part | DS 30 Days for 100 Rifles | GS 30 Days for 100 Rifles | Depot Maintenance for 100 Rifles |
|---|---|---|---|
| magazine | 6 | 4 | 15 |
| hand guard assembly | 2 | 2 | 20 |
| small arms sling | 2 | 2 | |
| trigger pin | 2 | 2 | 12 |
| trigger and sear assembly | 2 | 2 | 6 |
| hammer spring housing | 2 | 2 | 6 |
| ejector spring | 2 | 2 | 12 |
| hammer spring plunger | 2 | 2 | 4 |
| hammer pin | 2 | 2 | 8 |
| hammer | 2 | 2 | 12 |
| safety | 2 | 2 | 10 |
| safety spring | 2 | 2 | 12 |
| trigger guard | 2 | 2 | 12 |
| trigger housing assembly | 2 | 2 | 6 |

| | | | |
|---|---|---|---|
| magazine latch pin | 2 | 2 | 100 |
| magazine latch | 2 | 2 | 6 |
| magazine latch spring | 2 | 2 | 6 |
| stock subassembly | 2 | 2 | 20 |
| upper butt stock screw | 2 | 2 | 6 |
| stock nut retainer | 2 | 2 | 12 |
| stock nut | 2 | 2 | 12 |
| lower butt stock screw | 2 | 2 | 12 |
| butt swivel | 2 | 2 | 6 |
| hinged butt plate assembly | 2 | 2 | 12 |
| butt plate hinge pin | | | 24 |
| butt plate stop pin | | | 24 |
| butt plate rest (flapper) | | | 10 |
| butt plate ball bearing | | | 10 |
| butt plate hinge spring | | | 10 |
| butt plate door pin | | | 10 |
| butt plate door catch | | | 10 |
| butt plate door catch spring | | | 10 |
| connector assembly | 2 | 2 | 6 |
| connector pin | 2 | 2 | 300 |

| | | | |
|---|---|---|---|
| connector plunger | | | 12 |
| connector spring | | | 12 |
| operating rod spring guide | 2 | 2 | 6 |
| operating rod spring | 2 | 2 | 24 |
| operating rod | 2 | 2 | 8 |
| extractor | 2 | 2 | 24 |
| ejector with spring | 2 | 2 | 24 |
| extractor spring plunger | 2 | 2 | 12 |
| firing pin | 2 | 2 | 48 |
| bolt | 2 | 2 | 12 |
| bolt roller | 2 | 2 | 24 |
| bolt roller retainer | 2 | 2 | 24 |
| elevation knob and pinion assembly | 2 | 2 | 20 |
| windage knob | 2 | 2 | 24 |
| rear sight aperture | 2 | 2 | 6 |
| rear sight cover | 2 | 2 | 6 |
| rear sight base | 2 | 2 | 6 |
| selector shaft lock | 2 | 2 | 6 |
| selector switch | 2 | 2 | 6 |
| selector shaft spring | 2 | 2 | 6 |

| | | | |
|---|---|---|---|
| selector shaft | 2 | 2 | 10 |
| sear release | 2 | 2 | 6 |
| gas cylinder plug | 2 | 2 | 20 |
| gas piston | 2 | 2 | 6 |
| flash suppressor setscrew | 2 | 2 | 24 |
| flash suppressor nut | 2 | 2 | 12 |
| flash suppressor | 2 | 2 | 20 |
| front sight screw | 2 | 2 | 12 |
| front sight | 2 | 2 | 12 |
| gas cylinder lock | 2 | 2 | 12 |
| gas cylinder | 2 | 2 | 12 |
| spindle valve | 2 | 2 | 6 |
| spindle valve spring | 2 | 2 | 24 |
| front band | 2 | 2 | 10 |
| operating rod guide pin | 2 | 2 | 100 |
| operating rod guide | 2 | 2 | 6 |
| bolt lock pin | 2 | 2 | 100 |
| bolt lock | 2 | 2 | 6 |
| bolt lock spring | 2 | 2 | 20 |
| connector lock pin | 2 | 2 | 100 |

| | | | |
|---|---|---|---|
| connector lock | 2 | 2 | 6 |
| cartridge clip guide pin | 2 | 2 | 100 |
| cartridge clip guide | 2 | 2 | 5 |
| barrel | | | 20 |

# Appendix F

**Significant Testing and Evaluation of the M14 Rifle**

Throughout its history, the M14 rifle has been evaluated by the U. S. military for various purposes. The table below is an attempt to chronicle some of the more significant tests the M14 was a part of.

**Table 66: Significant Military Tests Involving the USGI M14 Rifle**

| Test Date(s) and Location | Lead Agency | Report Title and Date | Comments |
|---|---|---|---|
| 1956 - Fort Benning and Marine Test Center Quantico | US Army Aberdeen Proving Ground | *46th Report on Project No. TS2-2015* 1956 | Comparison tests of the T44E4, M1 Garand and T48 |
| July and August 1958 - Aberdeen Proving Ground and Fort Benning | US Army Continental Army Command | *Report of Project NR 2787 Evaluation of Small Caliber High Velocity (SCHV) Rifles* September 19, 1958 | Comparison of the M14, Winchester .224 and ArmaLite .223 caliber rifles |
| March 1958 - Fort Benning | US Army Infantry Board | *Evaluation of Small Caliber High Velocity Rifles, ArmaLite (AR-15)* May 1958 | M14 rifles are test control specimens for .222 Special ammunition testing |
| December 01, 1958 to March 22, 1959 - Fort Ord and Hunter Liggett Military Reservation (CA) | US Army Combat Developments Experimentation Center | *Rifle Squad Armed with a Light-weight High-Velocity Rifle* May 30, 1959 | Field trials of the M14, Winchester Lightweight Military Rifle and the ArmaLite .223 caliber rifle |

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|---|---|---|---|
| December 1960 to January 1961 - Lackland AFB | US Air Force Lackland Air Force Base | not available | Comparison of the M14, M2 Carbine and Colt's Manufacturing Co., Inc. .223 caliber rifle |
| May 22, 1961 to July 31, 1961 - Fort Benning | US Army Infantry School Fort Benning | *Rifle Squad and Platoon Evaluation Program 22 May 61 - 31 July 61* November 13, 1961 | Evaluation of infantry squad and platoon composition |
| September 28, 1961 to January 30, 1962 - Aberdeen Proving Ground | US Army Aberdeen Proving Ground Development and Proof Services | *Tests for Ad Hoc Committee on Accuracy and Targeting of 7.62-mm Ammunition and M14 Rifles Report No. DPS-471* by Laurence F. Moore March 1962 | Inspection and test of twenty-one sample M14 rifles |
| October 30 to December 15, 1961 - Hunter Liggett Military Reservation (CA) | US Army Combat Development Experimentation Center | *Rifle Platoon Firepower Experiment* March 1962 | Evaluation of infantry squad and platoon composition |
| November 01, 1962 to December 05, 1962 - Aberdeen Proving Ground | US Army Aberdeen Proving Ground Development and Proof Services | *Comparative Evaluation of AR-15 and M14 Rifles* by George E. Hendricks December 1962 | Comparison of the M14 and a .223 caliber M16 type rifle |
| Forty-eight documents cited including various U. S. Army reports | US Army Combat Developments Center | *Rifle Evaluation Study* December 20, 1962 | Comparison of the M14, M14 (USAIB), AR-15, AK47 and SPIW, portions of this report were classified Secret until 1974 |

| | | | |
|---|---|---|---|
| June 1965 to November 1965 - Fort Benning | US Army Infantry Board | *Small Arms Weapons Systems* December 1965 | Comparison tests of M14, M14E2, M60, XM16E1, CAR-15 models, HK33, AR18, and Stoner 63 models |
| 1968 - Fort Benning | US Army Aberdeen Ballistic Research Laboratories | *Accuracy of Rifle Fire: SPIW, M16A1, M14 Memorandum Report No. 1919* March 1968 | Comparison of the M14, SPIW, and M16A1 for accuracy in automatic mode |
| Data obtained from several sources | US Army Aberdeen Research and Development Center | *Technical Report No. 1 M16 Rifle System Reliability and Quality Assurance Evaluation* July 1968 | Analysis of data concerning reliability of the M14 and M16A1 rifles |
| 1968 - Fort Benning | US Army MTU | August 1968 | Accuracy tests of the M14 NM and M16 models |
| April 16 to August 19, 1970 - Aberdeen Proving Ground | US Army Aberdeen Proving Ground Material Testing Directorate | *Military Potential Test of Short Range Cartridges, 5.56-mm Ball, 7.62-mm Ball, and 7.62-mm Tracer* by Daniel Chmiel October 1970 | Comparison of actual cartridge performance versus published data |
| May 01, 1977 to December 30, 1977 - Aberdeen Proving Ground | US Army Aberdeen Proving Ground | February 1978 | Comparison of M21, modified M14, modified AR10, M40A1, French FR-F1, Winchester M70, Parker-Hale 1200TX. |

# Appendix G

**References to United States Patents**

The following table lists the patents associated with the text of this volume. What is often taken for granted was once new and innovative.

**Table 67: United States Patents**

| Patent No. | Date Filed | Date Approved | Inventor(s) | Description |
|---|---|---|---|---|
| 870937 | 04 Apr 07 | 12 Nov 07 | Thomas Watts Coslett | iron phosphate coating |
| 1069903 | 15 Aug 12 | 12 Aug 13 | Frank Richards | manganese phosphate coating |
| 1886218 | 29 Jun 27 | 01 Nov 32 | John M. Olin Alfons G. Schuricht | chromium plating of rifle barrels |
| 1892141 | 21 Apr 30 | 27 Dec 32 | John C. Garand | semi-automatic rifle with M1 style bolt |
| 1907163 | 23 Nov 31 | 02 May 33 | Joseph C. White | semi-automatic rifle with cutoff and expansion gas system |
| 1929418 | 10 Dec 30 | 10 Oct 33 | John C. Garand | rear sight base (M1, M14) |
| 1996393 | 23 Nov 31 | 02 Apr 35 | Joseph C. White | firearm breech closure and firing mechanism |
| 2198610 | 22 Nov 33 | 30 Apr 40 | John C. Garand | firearm extractor (M1, M14) |
| 2287805 | 13 Nov 41 | 30 Jun 42 | William B. Johnson | rifle rack (M1903, M1, BAR) |
| 2293716 | 03 Feb 41 | 25 Aug 42 | Van M. Darsey | zinc phosphate coating |

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|---|---|---|---|---|
| 2230654 | 01 Jul 39 | 04 Feb 41 | Roy J. Plunkett | tetrafluoroethylene polymers |
| 2337537 | 01 Jun 42 | 28 Dec 43 | Bryan C. Arnold | M2 aiming device |
| 2352191 | 21 Aug 43 | 27 Jun 44 | John C. Garand | firearm hammer mechanism (M1, T20, M14) |
| 2357363 | 16 Jun 42 | 05 Sep 44 | Hartley P. Smith | gun sling (M1, M14, M16) |
| 2363520 | 16 Jul 42 | 28 Nov 44 | Stanley W. Fish | combination cleaning tool |
| 2377338 | 16 Mar 39 | 05 Jun 45 | John C. Garand | firearm (improvements to the M1 rifle design) |
| 2406011 | 17 Mar 44 | 20 Aug 46 | John C. Garand | rear sight elevation and pinion assembly and windage knob (M1, M14) |
| 2449962 | 26 Mar 46 | 21 Sep 48 | Aaron Wachter and Nathan Stillman | volatile corrosion inhibitor chemical |
| 2458510 | 09 Nov 45 | 11 Jan 49 | John C. Garand<br>Eli G. Cooper<br>John R. Bird<br>Harold C. Miller | grenade launcher sight attachment (M15 sight) |
| 2462836 | 01 May 47 | 01 Mar 49 | Robert S. Barker<br>Erne L. Ballinger<br>Eli G. Cooper<br>Parley F. Lamberi<br>Edward C. Fletcher | magazine filler |
| 2486400 | 07 Jun 46 | 01 Nov 49 | John C. Garand | rear sight (M1, M14) |
| 2489283 | 19 Sep 47 | 29 Nov 49 | John C. Garand | bipod (M1) |
| 2499378 | 10 Apr 46 | 07 Mar 50 | John C. Garand | operating rod latch mechanism (T20) |

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|---|---|---|---|---|
| 2589227 | 27 Dec 49 | 18 Mar 52 | Martin H. Colley | winter trigger (T44 and M14) |
| 2710476 | 06 Jun 46 | 14 Jun 55 | John C. Garand | cartridge magazine latching system including the connector lock and operating rod spring guide (for M14) |
| 2715789 | 26 May 49 | 23 Aug 55 | John C. Garand | cartridge magazine (T31, T44, M14) |
| 2783570 | 29 Apr 54 | 05 Mar 57 | William R. Kunz | firearm magazine charger (for T44) |
| 2791942 | 08 Jan 54 | 14 May 57 | David C. Fletcher | rate reducer (for M1/ T20) |
| 2807112 | 24 Mar 54 | 24 Sep 57 | John C. Garand | grenade launcher for gun with a gas cylinder (for T44) |
| 2824322 | 21 Nov 55 | 25 Feb 58 | Nicholas J. Angelica and Robert S. Henry | chamber brush (M1, M14 and M60) |
| 2834137 | 15 Jun 56 | 13 May 58 | William R. Kunz | ten round magazine charger (T44E4) |
| 2841908 | 16 May 55 | 08 Jul 58 | Eugene Bourquin | trigger device (T44E4) |
| 2856720 | 14 Aug 56 | 21 Oct 58 | William R. Kunz | ten round magazine charger (T44E4) |
| 2864280 | 04 Apr 56 | 16 Dec 58 | William E. Keller | device for inspecting barrel bore straightness |
| 2869198 | 17 Aug 55 | 20 Jan 59 | Merton L. Clevett, Jr. | pistol belt clip (M1956, ALICE load bearing equipment) |

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|---|---|---|---|---|
| 2883781 | 23 Oct 57 | 28 Apr 59 | Earle M. Harvey | combination muzzle stabilizer, recoil brake, flash hider and grenade launcher (for M14) |
| 2894350 | 11 Apr 56 | 14 Jul 59 | Stefan Kenneth Janson | firearm magazine charger (for BAR and others) |
| 2920413 | 27 Jan 59 | 12 Jan 60 | Andrew J. Marefka Irving L. Kintish | arctic trigger |
| 2987821 | 19 May 59 | 13 Jun 61 | Jack F. Kettler | multilite sights (M14) |
| 3010370 | 05 Apr 61 | 28 Nov 61 | Stanley D. Silsby | controlled burst firing mechanism (M16 type) |
| 3011283 | 09 Mar 59 | 05 Dec 61 | James S. Lunn Harry T. Douglas Vagn Vernegaard | reinforced plastic rifle stock (M1) |
| 3091878 | 24 May 62 | 04 Jun 63 | Giulio V. Savioli | auxiliary trigger with safety (M14) |
| 3100936 | 23 May 61 | 20 Aug 63 | Nicholas J. Angelica | hooded eyepiece for sight aperture (M1 NM and M14 NM) |
| 3141254 | 18 Apr 62 | 21 Jul 64 | Giulio V. Savioli | auxiliary trigger with safety (M14) |
| 3327422 | 23 Oct 65 | 27 Jun 67 | Gerald Harris | bipod (Harris Bipods) |
| 3340614 | 19 Oct 64 | 12 Sep 67 | James M. Leatherwood | adjustment means for gun sighting scope (ART scopes) |
| 3345771 | 07 Jan 66 | 10 Oct 67 | Stanley D. Silsby | high capacity magazine and cooperating fire-arm structure (U. S. Army SPIW) |

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|---|---|---|---|---|
| 3363351 | 30 Mar 67 | 16 Jan 68 | Melvin A. Smith | bolt assembly (Eagle Arms carbines) |
| 3404477 | 23 May 61 | 08 Oct. 68 | Stanley D. Silsby | semiautomatic grenade launcher (for M14) |
| 3404478 | 23 May 61 | 08 Oct 68 | Stanley D. Silsby | semiautomatic grenade launcher (for M14) |
| 3404479 | 15 Nov 61 | 08 Oct 68 | Stanley D. Silsby | semiautomatic grenade launcher (for M14) |
| 3408761 | 13 Jun 61 | 05 Nov 68 | Stanley D. Silsby | grenade launcher firing mechanism with breech closure (for M14) |
| 3416252 | 02 Apr 63 | 17 Dec 68 | Stanley D. Silsby | grenade launcher combination firing and ejecting mechanism (M16 type) |
| 3421242 | 23 May 61 | 14 Jan 69 | Albert J. Lizza | grenade launcher ejector (for M14) |
| 3431652 | 21 Sep 66 | 11 Mar 69 | James M. Leatherwood | rangefinder and automatic reticle setter (ART scopes) |
| 3492733 | 23 Apr 68 | 03 Feb 70 | James M. Leatherwood | variable power sighting scope (ART scopes) |
| 3565539 | 12 Jun 67 | 23 Feb 71 | Joseph La Russa | collimated sight (M14) |
| 3566527 | 12 Dec 68 | 02 Mar 71 | Stanley D. Silsby | emergency firearm firing mechanism for grenade rounds (U. S. Air Force IMP) |
| 3568350 | 17 Dec 68 | 09 Mar 71 | Stanley D. Silsby | emergency firearm (U. S. Air Force IMP) |

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|---|---|---|---|---|
| 3604142 | 30 Jun 69 | 14 Sep 71 | Stanley D. Silsby | four stack cartridge magazine (U. S. Army SPIW) |
| 3672089 | 13 Aug 69 | 27 Jun 72 | Stanley D. Silsby | large capacity magazine (U. S. Army SPIW) |
| 3724325 | 24 Aug 71 | 03 Apr 73 | Stanley D. Silsby | firearm rate reducer (M16 type) |
| 3942901 | 07 Dec 73 | 09 Mar 76 | John Arne Ingemund Ekstrand | optical dot sight |
| 3977296 | 04 Dec 74 | 31 Aug 76 | Stanley D. Silsby | firearm hydraulic buffer assembly (M16 type) |
| 4139959 | 13 May 77 | 20 Feb 79 | William J. Howard<br>William A. Harvey | polymer cartridge magazine |
| 4955812 | 04 Aug 88 | 11 Sep 90 | Banford R. Hill | video target training apparatus and method (for M14) |
| 5012604 | 27 Mar 90 | 07 May 91 | Laurence B. Rogers | adjustable trigger assembly for M14 firing mechanism |
| 5265365 | 09 Jan 92 | 30 Nov 93 | Charles A. Finn | pouch and cheek piece for long gun |
| 5367812 | 28 Jun 93 | 29 Nov 94 | Peter Lautrec | gun stock extender (for M14) |
| 5596161 | 12 Jul 95 | 21 Jan 97 | Sonja Sommers | firearm muzzle flash suppressor (for M14, M16, etc.) |
| 6810616 | 22 Jul 01 | 02 Nov 04 | Guy Tal<br>Ran Tal | cartridge magazine loader and unloader accessory |

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|---|---|---|---|---|
| 6839998 | 31 Jul 03 | 11 Jan 05 | David P. Armstrong | replacement chassis stock system for firearms (Mk 14) |
| D296178 | 12 Nov 85 | 14 Jun 88 | Melvin A. Smith | fish scaler |
| D390302 | 19 Jul 96 | 03 Feb 98 | Larry Alan Bullock | M1A/M14 rifle recoil buffer |

# Appendix H

**Commercial Production Data**

The following table lists the production quantities for Armscorp and Springfield Armory, Inc. according to the Bureau of Alcohol, Tobacco, Firearms and Explosives. These quantities include complete rifles and separate receivers.

**Table 68: BATFE Production for Armscorp USA and Springfield Armory, Inc.**

| Year | Armscorp USA | Springfield Armory, Inc. |
|---|---|---|
| 1986 | | 1,028 |
| 1987 | | 2,888 |
| 1988 | | 4,002 |
| 1989 | | 9,846 |
| 1990 | | 9,171 |
| 1991 | | 12,044 |
| 1992 | | 4,802 |
| 1993 | | 6,942 |
| 1994 | 3,251 | 13,924 |
| 1995 | 289 | 9,068 |
| 1996 | 390 | 9,472 |
| 1997 | 6 | 10,124 |
| 1998 | 204 | 5,982 |
| 1999 | 189 | 10,515 |

| | | |
|---|---|---|
| 2000 | 206 | 9,506 |
| 2001 | 271 | 8,124 |
| 2002 | 732 | 14,627 |
| 2003 | 480 | 15,353 |
| 2004 | 367 | not available |
| 2005 | 387 | 11,239 |
| 2006 | 27 | 13,675 |

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"Ollis salus populi suprema lex esto" - Cicero, *De Legibus*