NPS Form 10-900
(Oct. 1990)

OMB No. 10024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

SENT TO D.C.
1-20-99

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name U.S. Army Aircraft P-51D-25NA 44-73287

other names/site number Worry Bird, Mustang

2. Location

street & number Capital Airport .5 miles North of Jct. of IL Rt. 29 & Veterans Parkway ☐ not for publication

city or town Springfield ☐ vicinity

state Illinois code IL county Sangamon code 167 zip code 62707

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this ☒ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ☒ meets ☐ does not meet the National Register criteria. I recommend that this property be considered significant ☒ nationally ☐ statewide ☐ locally. (☐ See continuation sheet for additional comments.)

William L Wheeler /SHPO 1-19-99
Signature of certifying official/Title Date

Illinois Historic Preservation Agency
State of Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. (☐ See continuation sheet for additional comments.)

Signature of certifying official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is: Signature of the Keeper Date of Action

☐ entered in the National Register.
☐ See continuation sheet.

☐ determined eligible for the National Register
☐ See continuation sheet.

☐ determined not eligible for the National Register.

☐ removed from the National Register.

☐ other, (explain:) _____

U.S. Army Aircraft
P-51D-25NA 44-73287
Name of Property

Sangamon, Illinois
County and State

5. Classification

Ownership of Property
(Check as many boxes as apply)

- ☒ private
- ☐ public-local
- ☐ public-State
- ☐ public-Federal

Category of Property
(Check only one box)

- ☐ building(s)
- ☐ district
- ☐ site
- ☒ structure
- ☐ object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
0	0	buildings
0	0	sites
1	0	structures
0	0	objects
1	0	Total

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing.)

N/A

Number of contributing resources previously listed in the National Register

N/A

6. Function or Use

Historic Functions
(Enter categories from instructions)

DEFENSE: air facility
TRANSPORTATION: air related

Current Functions
(Enter categories from instructions)

RECREATION AND CULTURE: museum

7. Description

Architectural Classification
(Enter categories from instructions)

OTHER: Fighter Aircraft

Materials
(Enter categories from instructions)

foundation
walls
roof
other METAL - aluminum, steel
SYNTHETICS - plexiglass, rubber

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

U.S. Army Aircraft
P-51D-25NA 44-73287
Name of Property

Sangamon, Illinois
County and State

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- [x] **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] **B** Property is associated with the lives of persons significant in our past.
- [x] **C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] **D** Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

Property is:

- [ ] **A** owned by a religious institution or used for religious purposes.
- [ ] **B** removed from its original location.
- [ ] **C** a birthplace or grave.
- [ ] **D** a cemetery.
- [ ] **E** a reconstructed building, object, or structure.
- [ ] **F** a commemorative property.
- [ ] **G** less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

ENGINEERING
MILITARY

Period of Significance

1944, ENGINEERING
1945-1948, MILITARY

Significant Dates

1944

Significant Person
(Complete if Criterion B is marked above)

N/A

Cultural Affiliation

N/A

Architect/Builder

North American Aviation, Inc.
Edgar Schmued, Designer

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

Bibliography
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):

- [ ] preliminary determination of individual listing (36 CFR 67) has been requested
- [ ] previously listed in the National Register
- [ ] previously determined eligible by the National Register
- [ ] designated a National Historic Landmark
- [ ] recorded by Historic American Buildings Survey # _____
- [ ] recorded by Historic American Engineering

Primary location of additional data:

- [ ] State Historic Preservation Office
- [ ] Other State agency
- [ ] Federal agency
- [ ] Local government
- [ ] University
- [ ] Other

Name of repository:

U.S. Army Aircraft
P-51D-25NA 44-73287
Name of Property

Sangamon, Illinois
County and State

10. Geographical Data

Acreage of Property Less than one Acre

UTM References
(Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing
1	16	271040	4413210
2			
3			
4			

☐ See continuation sheet

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title Stephen A. Thompson, Cultural Resource Manager

organization Illinois Historic Preservation Agency date 31 August 1998

street & number 1 Old State Capitol Plaza telephone 217-782-8168

city or town Springfield state IL zip code 62701

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A **USGS map** (7.5 or 15 minute series) indicating the property's location.

A **Sketch map** for historic districts and properties having large acreage or numerous resources.

Photographs

Representative **black and white photographs** of the property.

Additional items
(Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of SHPO or FPO.)

name Mike George

street & number #6 Fox Mill Lane telephone 217-525-1335

city or town Springfield state IL zip code 62707

U.S. ARMY AIRCRAFT P-51D-25NA 44-73287 DESCRIPTION

U.S. Army Aircraft P-51-D-25NA 44-73287, Federal Aviation Administration (FAA) registration number NL951M, is a representative example of the 8,202 P-51D "Mustang" United States Army Air Force (USAAF) fighter aircraft manufactured by North American Aviation, Incorporated between 1942 and 1945. Date of manufacture for this aircraft is 7 June 1944.[1] The finished version was delivered to the United States Army on 7 March 1945.[2] P-51D-25NA 44-73287 is owned by security systems and real estate entrepreneur Mike George of Springfield, Illinois. This aircraft's current permanent base of operations is the Air Combat Museum located at Capital Airport in Springfield, Illinois.

General characteristics of P-51D-25NA 44-73287 are consistent with the original North American Aviation P-51D specifications, which include a semimonocoque aluminum alloy fuselage, full-cantilever aluminum alloy wing assembly, aluminum alloy vertical and horizontal stabilizers and a V-12, supercharged Packard-Merlin engine.

A brief explanation of the USAAF alpha/numeric designator is prudent before further examination of this aircraft is undertaken. The P designator indicates a pursuit aircraft. Pursuit aircraft are commonly known as fighters. In September of 1947, the USAAF was redesignated as an independent branch of the Department of Defense and became the United States Air Force (USAF). At that time, the P designator was changed to F for fighter. Contemporary fighter designs in USAF service include the McDonnell Douglas F-15 "Eagle" and the Lockheed-Martin F-16 "Falcon".

The 51 portion of the designator indicates the 51st model of pursuit aircraft purchased by the USAAF. The D identifies the 3rd variation of the original P-51 design. The 25NA designation indicates the North American Aviation manufacturer's series number and the plant, Inglewood, California, where the craft was manufactured. The 44 indicates the federal fiscal year the plane was contracted for and the five digit concluding number is the USAAF serial number. P-51D-25NA 44-73287 will be referenced by the abbreviated designator of 44-73287 throughout sections 7 and 8 of this nomination form.

Directional references when describing elements of 44-73287 will be port for left of, starboard for right of, forward (fore) for in front of and aft for rear of the pilot's operating position. This system of reference is the result of terminology applied to aircraft when, early in their production, they were classified vessels like ships and boats.

CREW AND SUPPORT STAFF

Crew - Pilot

Support Staff

Powerplant, Structural and Flight Control Mechanics
Communication, Navigational, Electrical and Fuel Technicians
Armorers

HISTORICAL INFLUENCES

The design evolution of the P-51 followed fighter aircraft engineering trends developed during the late 1930s aimed at providing multi-purpose, high performance interceptors capable of engaging and defeating adversaries with similar characteristics. The P-51 demonstrates the zenith of propeller driven U.S. fighter aircraft engineering, as shortly after its development and mass production jet powered fighters became the desired design.

ENGINEERING SYSTEMS

In addition to the aerodynamic and power engineering systems present in the P-51D aircraft, integrated P-51D engineering sub-systems supporting flight and general operations include: flight control, hydraulic, electrical, fuel, oil, coolant, navigational, radio, oxygen, and armament.

WEIGHT AND PAYLOADS

Empty operational weight for the P-51D is 7,635 pounds. Gross weight for the P-51D to achieve maximum performance levels in combat scenarios is 11,600 pounds.[3] Standard combat payload for the P-51D consists of the pilot, the pilot's personal equipment, maximum wing and fuselage fuel tank capacities and maximum machine gun ammunition loads. Payload weight is often increased by the addition of external fuel tanks, two 500 pound bombs and six 5-inch rockets.[4]

PERFORMANCE

Service ceiling, maximum operational altitude, for the North American P-51D is 43,000 feet. Maximum speed for the level fight of the P-51D equipped with the specified Packard-Merlin V-1650-7 engine varies at different altitudes due to the oxygen density levels available for fuel mixture and carburetion functions. Without combat ordnance and external fuel tanks, maximum level flight speed at 10,000 feet is 432 miles per hour (mph). Under the same circumstances at 40,000 feet, maximum speed is 460 mph.[5]

The standard fuel capacity for the P-51D is 269 gallons of grade 100/130 aviation fuel. Fuel is stored in 92 gallon self-sealing capacity tanks present in each wing section adjacent to the fuselage and in an 85 gallon self-sealing axillary tank installed in the fuselage aft of the cockpit. External 75 or 110 gallon drop fuel tanks can be mounted on the wing ordnance pylons for extended distance and performance purposes. 110 gallon fuel tanks are rarely used, as the weight of these tanks impose near-limit loads on the wings and ordnance pylons.[6] Combat performance level operational range for a fully loaded P-51D carrying 269 gallons of fuel is 500 miles. With external 75 gallon tanks, this range is increased to 880 miles. When not loaded for or performing at combat levels, the P-51D has a standard range of 1,200 miles or 1,830 miles with the addition of the 75 gallon external fuel tanks.[7]

POWER PLANT

The standard factory power plant specification for the P-51D is the 12 cylinder, liquid-cooled, fuel injected, two-stage supercharging Packard-Merlin V-1650-7 engine. The -7 engine contains 21 gallons of aviation lubrication oil. Two coolant systems exist for the -7 engine. The primary coolant system for the engine has a capacity of 16.5 gallons. The after-cooling system, which cools the supercharger fuel-oxygen mixture, operates at a lower pounds per square inch (psi) pressure than the primary coolant system and has a capacity of five gallons. The coolant used for both systems is a mixture of ethylene glycol and water. Ignition power is supplied by the engine magnetos which are completely independent of the electrical system powered by a 24-volt battery located in the engine compartment. All P-51Ds are equipped with a Hamilton Standard 4-blade, cuffed or paddled, hydromatic propeller.[8]

The -7 engine develops over 1,400 horsepower on takeoff and can generate up to 1,600 brake horse power (BHP) at war emergency (maximum) power. BHP is a measurement of power available to the propeller after heat, friction and accessory drive losses within the engine are taken into account.[9] 975 BHP is the standard output for the -7 engine at cruising speed, 350 miles per hour, at sea level.

The -7 engine was a modification of the Packard-Merlin V-1650-3 model. The -7 modification to the -3 design reduced the gear ratio of the two stage supercharger (blower) which increased performance below 25,000 feet, the altitude that was found to be the optimal operating ceiling for bomber escort and other combat functions conducted by the P-51D.[10] The supercharger automatically increases/decreases the engine output at different altitudes to maintain constant performance levels. The supercharger can be manually regulated by the pilot if higher or lower performance levels are desired.

The -7 engine is positioned forward of the engine firewall located at the front of the cockpit and is supported by aluminum engine mounting cradle attached to the main fuselage section. The 11 foot 2 inch diameter Hamilton Standard propeller is attached to the engine drive shaft and is covered by a tapered, aluminum nose cap (spinner). The engine compartment is covered with by five 24ST

aluminum alloy access panels. A carburetor air scoop is integrated in the lower access panel, which also contains perforated carburetor air filter panels on each side approximately a foot to the rear of carburetor air scoop opening. Exhaust pipes with shrouds connected to the engine manifolds potrud on the port and starboard side of the engine access panels. A semi-circular armor plate is mounted to forward/upper engine support members to the front of the engine coolant reservoir.

The factory specified overhaul window for the 1940s era Packard-Merlin V-1650-7 engine is 300 hours of operation.[11] In World War II combat units, the engine overhaul standard was reduced to 60 hours. The contemporary standard for overhaul is 550 hours.[12]

44-73287 is equipped with the Packard-Merlin V-1650-7 engine and Hamilton Standard paddled, 4-blade propeller.

WING

The wingspan of 44-73287 is 37.03 feet and has a wing area of 236 square feet.[13] The two full-cantilever wing assemblies have common internal construction consisting of a main and aft aluminum spar positioned perpendicular to the fuselage. Parallel to the fuselage, each wing assembly contains twenty-one pressed aluminum structural ribs designed to maintain laminar flow shape. A center rib on the lower section of the fuselage is used to join the two wing assemblies to form the total wing. Extruded stringers are fastened to the ribs and covered with 24ST aluminum alloy sheet stock. Box sections are formed between the spars by the use of aluminum rib formers to provide space for the three .50 caliber Browning machine guns, ammunition feed chutes, ammunition, the landing gear assembly and a 92 gallon fuel tank in each wing assembly.

Common external features of 44-73287's upper wing assemblies include a removable wingtip containing a navigational light, flap, aileron with trim tab, machine gun barrel access cover, machine gun bay door with bore sighting information placard, machine gun ammunition bay access panel and wing fuel tank filler cap. On the port wing flap is the flap position indicator. The underside of each wing assembly contains two wheel bay doors with the landing

gear assembly attached to the outer door, a radio antenna and three empty .50 caliber shell casing ejection chutes. An underwing ordnance pylon, which is plumbed to mount external fuel tanks, along with three forward and three aft 5-inch rocket mounts are located below the machine gun bays on each wing assembly. The underside of the port wing contains a landing light in the landing gear bay and near the wing tab on the underside of the starboard wing are the red, yellow and green flush-mounted formation/signal lights. A pitot tube containing air speed, altitude and rate of climb sensors is also located on the underside of the starboard wing on the inside portion of the USAAF star and bar insignia. A red teardrop shaped navigation light lens is located on the port wing tip. The starboard wingtip contains a blue teardrop shaped navigation light lens.

Internal components common to each wing assembly include elements of the hydraulic system used in operation of the landing gear, brakes, and flaps, and electrical system features for operation of the machine guns, wing lights and fuel pumps. The K-6 gun camera is mounted in the leading edge of the port wing. Also located internally in the port wing assembly is the remote reading compass transmitter.

FUSELAGE

44-73287's two section, semimonocoque fuselage is constructed entirely of aluminum alloy and is 32 feet and 2 5/8s inches in length.

Four main longerons (support members), two upper and two lower, comprise the foundation for the basic structure of the main fuselage, which extends from the engine firewall to the rear of the cockpit. Aluminum formers (ribs) connected to the longerons maintain the fuselage shape and are covered with 24ST aluminum alloy sheet stock which is flush riveted in place. Mounted on top of the main fuselage is a fixed, three section windscreen containing bullet proof plexiglass. Mounted above the cockpit is a plexiglass, bubble canopy. A three-section air scoop containing the coolant and after coolant systems radiators is located on the underside of the main and rear fuselages. The middle section of this air scoop contains the coolant system radiator, is the largest

component of this feature and is often referred to as the "doghouse". The fuel filler cap for the 85 gallon auxiliary fuel tank is located at the rear of the cockpit on the port side of the fuselage above the port wing assembly flap. Also located on the port side of the main fuselage below the canopy are an arched, spring-loaded door to assist the pilot when entering or leaving the cockpit, and a flare pistol firing port.

The rear section of the fuselage of 44-73287 is constructed on two longerons, a flat shelf and a bulkhead. The rear fuselage extends from the rear of the cockpit to the rear tail cone. Located on the starboard side of the rear fuselage is the external power receptacle. A radio mast (antenna) is located on the top of the rear fuselage. Excess fluid drain tubes potrud from the rear fuselage at the junction of the wing flap assembly on both the port and starboard sides. Internal components of the rear fuselage include, wound steel fight control cables running from the cockpit to the rudder and horizontal stabilizer elevators, oxygen system cylinder and wing flap operating strut and flap control valve. The dorsal fin fillet is mounted on top of the rear fuselage and attached to the vertical stabilizer.

The main and rear fuselage contain numerous, small removable panels intended for interior systems maintenance access. The main and rear fuselage are bolted together behind the cockpit at the transportation joint.

COCKPIT

The cockpit of 44-73287 includes pilot flight and armament controls, radio and oxygen equipment, flight/systems instrumentation and a rear seat.

The floor of the cockpit is aluminum plate and rests upon the lower longerons of the main fuselage. The armor plated engine firewall is mounted on the lower main fuselage longerons just forward of the cockpit floor. The hydraulic system reservoir is attached to the engine side of the firewall. Mounted on the cockpit floor directly to the front of the floor mounted, aluminum framed, cushioned pilot's seat with headrest are the flight control stick and instrumentation panel. Mounted on main fuselage formers below the

instrument panel are the brake and rudder foot controls. To the rear of the pilot's seat in standard P-51Ds are the 85 gallon auxillary fuel tank and numerous elements of the radio communications system. 44-73287 has been modified by removal of the auxillary fuel tank and radio communications equipment mounting racks to accommodate a rear seat.

44-73287's instrument panel contains gauges, switches and controls related to the operation of the aerodynamic, engine, armament, navigation and fuel systems. The instrument panel of 44-73287 has been modified only by the addition of a Global Positioning System (GPS) map screen for navigational purposes.

Mounted on fuselage formers on the port side of the cockpit are controls and switches related to aerodynamic, engine, fuel, coolant, hydraulic and electrical systems operations. Included in this area are throttle, fuel mixture, propeller, flap, rudder, trim tab, landing gear controls and K-14B gunsight controls.

Mounted on fuselage formers on the starboard side of the cockpit are switches, controls and mechanisms related to the oxygen, radio, navigational and electrical systems operations. Included in this area is the manuafacturer's data plate, the canopy crank and lock and the emergency canopy release. The oxygen regulator with an attached flexible hose and mask is positioned on the upper fuselage just to the rear of the instrument panel.

Attached to an aluminum fuselage former to the rear of the windscreen and above the instrument panel is a K-14B gunsight. This sight contains both fixed and gyro actuated optical systems and computes the correct lead angle for targets at ranges from 200 to 800 yards.[14]

TAIL ASSEMBLY

The tail assembly for 44-73287 consists of aluminum framed and covered horizontal and vertical stabilizers and the rear tail cone assembly. The rear tail cone is connected to the rear fuselage above the fuselage radiator air scoop exhaust port by upper and lower aluminum alloy panels. The 13.2 feet span horizontal stabilizer containing aluminum covered elevators and trim tabs is

bolted to the rear tail cone. The 6.3 feet in height vertical stabilizer containing the fabric covered rudder, trim tab, radio antennas approximately one foot below the peak on both sides, and white-lensed navigational lights at the mid-point on each side, is bolted to a vertical slot in the tail cone assembly. The rear white lens covered navigational light is located on the lower rudder. The tubular steel landing gear assembly, containing a steerable magnesium wheel and rubber tire, is mounted on aluminum formers in the interior of the rear tail cone. The rear landing gear is deployed through rear landing gear doors attached to the rear tail cone. The aluminum lower rudder cap is attached to the fuselage and extends the length of and below the rudder.

LANDING GEAR/LANDING GEAR BAY

The two tubular steel, hydraulically operated forward landing gear assemblies, with attached magnesium wheels and rubber tires, are housed in the port and starboard wing landing gear bays when in flight. The wheel bays also contain the landing gear operating struts, landing gear door operating struts, hydraulic system plumbing and electrical system wiring. The K-6 gun camera is accessed through the port wheel bay.

PAINT SCHEME AND MARKINGS

44-73287 was delivered to the USAAF in its stock aluminum sheet metal finish with an anti-glare band painted in olive drab green on the top portion of the engine access panels in front of the cockpit. The upper surface of the wing was painted silver. Also included at the time of delivery would have been the standard USAAF blue and white star and bar insignia on each side of the fuselage to the rear of the cockpit and on the upperside of the port and lower side of the starboard wing assemblies. Painted on the vertical stabilizer and rudder at the time of delivery would have been the abbreviated USAAF identification number 4-73287. Various camouflage schemes, organizational markings and authorized pilot selected nose art and names would have been applied as 44-73287 served with different Army, Air Force, and Air National Guard units.

44-73287 is currently painted to interpret the P-51D piloted by Lieutenant Bob Frisch of the 503rd Fighter Squadron, 339th Fighter Group of the 8th Air Force which was base at Fowlmere, England from April 1944 to October 1945.[15] This marking/paint scheme includes the aforementioned USAAF insignias, identification number, silver upper wing surface and olive drab green anti-glare application in addition to the 503rd Fighter Squadron markings and the scripted aircraft name.

The markings for this interpretation include vertical red and white bands on the spinner and propeller spacers, a red and white checkerboard pattern on the engine access covers aft of the propeller, markings of the 339th FG. The scripted "Worry Bird" name is painted in red on port and starboard engine access covers aft and below the exhaust ports. On the fuselage to the rear of the cockpit adjacent to the USAAF insignia are the 503rd FS markings D7 and J identifying the individual squadron aircraft. Below the fuselage USAAF insignia are two black and one white "invasion" ground-to-air identification bands. On the port side of the fuselage below the canopy and windscreen juncture are six miniature National Socialist Party flags painted in red, white and black, representing the six enemy planes destroyed by Lt. Frisch.[16] A red cross marking exists on the lower fuselage above the port wing identifying emergency equipment access. European Theater of Operations (ETO) identification markings in the form of 18 inch black bands located between the machine gun bay and the fuselage are located on the upper and lower wing assemblies. USAAF insignia are located on the upper side of the port and lower side of the starboard wing. The upper and lower surfaces of the horizontal stabilizer contains a 24 inch black ETO identification band at approximately the mid-point. The rudder is painted red, another identifying marking of the 503rd FS. The FAA identification number NL951M is painted on each side of the rear tail cone below the horizontal stabilizer.

MODIFICATIONS

P-51D-25NA 44-73287 was built by North American Aviation, Incorporated under a U.S. Army contract as a standard P-51D fighter aircraft. Throughout its twelve plus years service with the USAAF, USAF, and Air National Guard units, regular maintenance schedules

would have resulted in the replacement of original components of the primary and sub-engineering systems and basic instrumentation due to excessive wear and failures.

Prior to the sale by the USAF to its first civilian owner, William Kelbaugh, it is speculated that all sensitive military items such as machine guns, ordnance pylons and basic radio equipment were removed. An early civil owner, possibly Kelbaugh, removed the inner gun bay aluminum rib in each wing assembly to increase the wing fuel tanks' capacity. It is known that Kelbaugh was responsible for the removal of the 85 gallon auxiliary fuel tank and radio mounting racks in March of 1959 for installation of the rear cockpit seat.[17] A modification undertaken by an unknown owner incorporates an aluminum panel on the port main fuselage which provides access to an interior baggage compartment below the rear seat.

When 44-73287 was acquired by Mike George in 1989, he initiated a restoration program to bring the craft back to accurate military specifications. For the wing gun bays, surplus ribs were located and installed as well as inoperable, aluminum .50 caliber machine guns, gun solenoids and feed tray mechanisms. In the cockpit, all historic components possible were restored including the K-14B gunsight. George was also able to acquire a ordnance pylon, mounts for 5-inch rockets and 75 gallon external fuel tank for each wing assembly.

Although no aerodynamic or powerplant modifications have been made to this aircraft, George undertook minor modifications for safety and contemporary radio, navigational requirements. George's modifications in these areas have included the replacement of the oxygen system storage cylinders with a high pressure, large capacity single cylinder system, GPS equipment and engine fire bottle/operator. These modifications have not diminished the aircraft's integrity as can be evidenced by a Oshkosh Air Show Preservation Award in 1993 and the Reserve Grand Champion World War II classification at Oshkosh in 1995.

INTEGRITY

P-51D-25NA 44-73287 is in superb condition and is fully operational. This aircraft is to be considered an excellent candidate for listing on the National Register of Historic Places and National Historic Landmark designation in that it possesses substantial physical integrity in the following areas:

Materials

44-73287 retains its integrity in the category of original materials in that any materials or components replaced, such as engines, propellers, wing assembly components, rudder fabric and external aluminum covering have been done in accordance with periodic maintenance schedules and due to excessive wear. The fuselage and wing assemblies are original to the craft. This is a rare instance with surviving P-51Ds, as they are often acquired as parts from the remains of multiple craft or are largely modern re-fabrications. Restoration of this aircraft to World War II era integrity has been accomplished using original parts and components and is supported by original P-51 construction documents and specifications in the Michael George Archives.[18]

Design

44-73287 retains its integrity of design in that it continues to exhibit almost flawless exterior, interior and engineering systems characteristics of the original P-51D design as adopted for military use.

The external and internal aerodynamic/engineering features and controls which are essential in the conveyance of the P-51D's design significance are entirely intact. While the cockpit displays seating alterations intended for civil functions, this does not diminish the integrity of the original P-51D design.

To support the appropriateness of this modification, it should be noted that the North American plant in Dallas, Texas produced ten two seat, single control P-51D trainers designated TP-51D-25NT at approximately the same time 44-73287 was being constructed.[19]

Additionally, North American Aviation's P-51D chief designer Edgar Schmued stated in one of his last interviews that the rear seat design for the P-51 originated in 1942 through a request from USAAF Commanding General Henry (Hap) Arnold who wished to use a P-51 for his personal transportation.[20] It is evident the precedent for 44-73287's second seat modification originated with the North American engineers and does not vary from the one of the P-51D's originally intended functions.

Workmanship

44-73287 being of mass produced parts does not exhibit any noticeable features in those elements. Individual workmanship spanning from original factory assemblers to present day maintenance technicians is evident.

On the assembly line, the mass produced aerodynamic parts of P-51Ds were painstakingly assembled by workers confronted with specifications of exacting tolerances. The pressures and strains placed upon the P-51D airframe operating at maximum performance levels required almost customized fitting of these components. During the P-51's design testing phases, it was discovered that the interchanging of parts such as the engine access covers or stabilizer assemblies between planes at unit maintenance facilities could result in sub-standard performance with often disastrous results. Due to the customized assembly by North American plant technicians, the USAAF instituted the policy of stamping or stenciling various aerodynamic components so that accidental interchange of parts on the flight line or in maintenance hangars could be avoided.[21]

Restoration work conducted on 44-73287 has been undertaken to duplicate the craftsmanship of the North American Aviation assemblers and technicians. Details such as the paint scheme evokes the craftsmanship exhibited by USAAF squadron personnel.

Location/Setting

44-73287 is a resource designed to be mobile. Its significance is inherent on its ability to operationally, if possible, move from

one location to another. Location, as an integrity factor in the case of this aircraft, should be deferred to the integrity factor of setting. 44-73287's location is of little consequence as long as the setting is appropriate and leads it to convey its significance as the premier World War II era U.S. fighter aircraft design.

44-73287 is home-based at the hangar complex of the Air Combat Museum at Capital Airport in Springfield, Illinois. Capital Airport has been the home base of the 183rd Fighter Group of the Illinois Air National Guard since its establishment as the 169th Fighter Squadron in 1946. Its first assigned fighter was the P-51D "Mustang". 44-73287's current setting with existing hangars, runways and other air facility support resources, along with the fact that military P-51Ds were actually stationed on site, demonstrates that the aircraft is able to convey its significance and integrity of location and setting at its current home base.

Feeling/Association

44-73287 retains complete presence of physical features enabling it to project a sense of the World War II USAAF P-51D single engine military fighter. 44-73287 is directly associated with U.S. military fighter aircraft design and development.

ENDNOTES

Section 7

1. P-51D-25NA 44-73287 Fuselage Data Plate. North American Aviation Inc., Inglewood, California, 7 June 1944.

2. United States Air Force, Request for Materials Form, No. 0-245 (Maxwell AFB, Alabama: The Albert F. Simpson Historical Research Center, 5 October 1978), Section 16.

3. Robert W. Gruenhagen, Mustang: Story of the P-51 Fighter (New York: Arco Publishing Company, Inc., 1969), 176.

4. Pilot Training Manual for the Mustang P-51, AAF Manual 51-127-5 (Washington, D.C.: HQ Army Air Forces [1945]), 40.

5. Mike George, Interview by Stephen A. Thompson. Springfield, Illinois: 12 August 1998.

6. Pilot Training Manual for the Mustang P-51, 21.

7. Gruenhagen, Mustang: Story of the P-51 Fighter, 192.

8. Ibid, 178.

9. Ibid, 180.

10. Ibid, 91.

11. Ibid, 91.

12. Mike George, Interview by Stephen A. Thompson. Springfield, Illinois: 07 August 1998.

13. Gruenhagen, Mustang: Story of the P-51 Fighter, 176.

14. Pilot Training manual for the Mustang P-51, AAF Manual 51-127-5, 41.

15. Moll, "Worry Bird-Mike George's P-51,", 19.

16. Ibid, 19.

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19. Gruenhagen, Mustang: Story of the P-51 Fighter, 202.

20. Jacquelyn Lanpher, Edgar Schmued-The Father of the P-51 Mustang, in P-51 Mustang ed. Gardner n. Hatch, (Paducah, Kentucky: Turner Publishing Company 1993), 180.

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U.S. ARMY AIRCRAFT P-51D-25NA 44-73287 SIGNIFICANCE

U.S. Army Aircraft P-51D-25NA 44-73287 is nationally significant under Criterion A in the area of military history. 44-73287 was constructed by North American Aviation, Incorporated for the U.S. Army during 1944 and was delivered to the United States Army Air Force (USAAF) on 7 March 1945. During its period of significance, 1945-1948, this aircraft served in the interceptor and ground support roles with the USAAF, which evolved into the United States Air Force (USAF) in 1947. The year 1948 is cited as the terminating date of significance under Criterion A due to the National Register of Historic Places' established 50 year cut-off date.

44-73287 is a fully operational example of the third variation of the P-51 single-engine, mono-wing airframe which North American Aviation designed and manufactured between 1940-45 to assist the USAAF and its allied counterparts in achieving air superiority over Axis Air Force fighter designs operating in all World War II combat theaters. In addition to its adoption by the USAAF, the P-51D was added to the fighter inventory of the air forces of England, Canada, Australia, South Africa, New Zealand, France and China during World War II. The P-51D's worldwide popularity is exhibited further by its adoption and service in the air forces of Sweden, Switzerland, Italy, Israel, Indonesia and miscellaneous Central/South American countries in the post World War II era.[1]

44-73287 conveys its significance in the area of military history through its association with and use by the USAAF, USAF and various U.S. Air National Guard units during and after World War II. P-51Ds were used by these organizations for a variety of missions. The functions of the P-51D included interception of enemy aircraft, long-range bomber escort, armament support for land and sea forces, photographic reconnaissance, general aerial reconnaissance and flight training. In its role as a long-range bomber escort in the European Theater of Operations during World War II, the P-51D design exhibited its greatest influence and is credited by many air historians, USAAF veterans and its adversaries as the plane that shifted the European airwar in favor of the allied forces.[2]

Additionally, 44-73287 demonstrates national significance under Criterion C in the category of engineering. This aircraft exhibits

the aerodynamic, power plant, armament and other engineering sub-system designs that allowed the P-51D to perform at levels surpassing other single-engine, propeller-driven, fighter aircraft during World War II. The period of significance for Criterion C is 1944, 44-73287's year of construction.

44-73287 is to be considered of national significance. Of the 8,202 P-51Ds manufactured by North American Aviation, Inc., 44-73287 is one of only 166 remaining in the U.S. Of this number, 104 are operational.[3] Of the remaining U.S. P-51Ds, many have been reconstructed with modern materials and highly modified for the recreational sport of Unlimited Air Racing. Approximately 60 of the remaining U.S. P-51Ds are interpreted in their World War II configuration and even less retain a high percentage of their original airframe integrity as does 44-73287.[4]

44-73287's current home base at the Air Combat Museum, Capital Airport in Springfield, Illinois presents a setting of storage/maintenance hangars, parking aprons, taxiways and runways consistent with similar environments this aircraft would have operated from during its period of significance.

FIGHTER AIRCRAFT DEVELOPMENT

World War I

In August 1914, world military powers hardly seemed to have considered the plausibility of deploying aircraft in battle. Despite the fact that successful powered flight technology was more than a decade old at the outbreak of World War I, little had been done to train aviators or to design and build aircraft suited for combat. German and British air forces could muster a total of 430 planes between them at the start of the conflict. These aircraft were flimsy machines, which at best, could only achieve speed of 60-70 miles per hour, a range of 200 miles and approximately 9,000 feet in altitude in optimum environmental conditions. Unreliability and constant maintenance were their common characteristics.

The early World War I bi-planes were unarmed and were almost exclusively for reconnaissance missions. The intelligence provided

on enemy positions, troop/supply movements and munitions dumps was invaluable to infantry and artillery commanders. Had it not been for information on German troop movements supplied by British and French pilots, the Germans could have easily taken Paris within the first weeks of the conflict.[5]

To the military leaders of the Great War, early in the struggle it became apparent that an important strategy in the air combat setting was to prevent the enemy from receiving and using aerial reconnaissance information. The aviators flying over the battlefields, seizing upon this directive, soon began engaging enemy aircraft they encountered with pistols, rifles and shotguns. Although the effectiveness of this first form of air-to-air combat was negligible, that changed in early 1915 when Dutch aircraft designer Anthony Fokker developed a synchronized system that allowed a pilot-operated, upper fuselage mounted Spandau machine gun to fire through the engine propeller without damaging the blades. With this system incorporated in the German Eindecker E. III monoplane, the air war became a deadly affair. German pilots flying the E. III soon created and perfected the maneuvers and strategies of successful aerial fighting resulting in German domination of the skies over the battlefields until the middle of 1916.

In what was the initiation of the air superiority design competition that continues to the present day, the British with their D.H. (de Havilland) 2 and the French with the Nieuport 11 challenged the German E. IIIs with their own synchronized Lewis machine gun systems in the later part of 1916. Over the next two years, development of aircraft such as the British Sopwith Camel, the French SPAD XIII and the German Albatross D.Va fueled the race for control of the air. Incorporation of new technology into the World War I aircraft was somewhat equal, as the airwar was a stalemate until just prior to the collapse of the entire German and Central Powers military in October and November 1918.

During the four years of the Great War, fighter aircraft advanced from the point of non-existence to state-of-the-art technology designed for multiple functions. When the Armistice was signed, the most advanced British, French and German fighter designs were capable of achieving speeds of 120 miles per hour and altitudes of 23,000 feet in their role as interceptors, reconnaissance and

ground support aircraft.

Between the Wars

During the fifteen years following the end of World War I, further refinement of high performance fighter aircraft was almost non-existent or done in very clandestine locations due to conditions of the Armistice on the defeated powers. The need for fighter aircraft was considered by many nations to be a low priority as the result of the "War to end all Wars" had eliminated the necessity for such planes.

By the late 1920s, the fledgling U.S. aircraft manufacturing industry was concentrating on recreational and commercial designs. The U.S. military, which had used British and French planes during World War I, seemed oblivious to the need for an air superiority aircraft in its inventory. This pattern of thought shifted in the 1930s as the goals and methods of the aggressive military regimes of Japan and Germany became evident.

The first of the primarily metal, mono-wing fighters appeared in the guise of the Russian Polikarpov I-16, German Messerschmitt Me 109 and the Japanese Mitsubishi A5M during the mid-1930s. These craft could achieve speeds in the 300 miles per hour range and aerodynamic characteristics that brought an end to the era of the bi-wing fighters. The German Me 109 was exceptionally gifted, with a maximum speed exceeding 350 miles per hour and unequaled armament system featuring machine guns and aerial cannon. Not to be left behind in this ultimate fighter design race, British Hawker Hurricanes and Supermarine Spitfires, French Dewointine D.520s along with U.S. Curtiss P-40 "Kittyhawks" and Gruman F4F "Wildcats" soon started to fill the ranks of what would be the Allied air forces of World War II.

World War II

The power and influence of modern fighter planes under the control of well-trained pilots became very apparent as the world observed the German Air Force (Luftwaffe) destroy the air forces of Poland, Denmark, Norway, Holland, Belgium and France in late 1939 and early 1940. Hawker Hurricanes sent to France by England during this period made a good showing against the Messerschmitt Me 109 and

twin-engined Me 110 fighters employed by the Luftwaffe but, in the end, these British planes were outnumbered, outgunned and outperformed by the Me 109.

After the fall of France, the Germans turned their attention to the British Isles. Before a seaborne invasion could take place, the British Royal Air Force (RAF) had to be destroyed. Luftwaffe Reichsmarshall Hermann Goring assured German Commander-in-Chief Adolf Hitler that this mission could be accomplished in short order. With almost 1,000 Me 109s and Me 110s available to meet the hodge-podge British fighter force of 600, Luftwaffe confidence was high.[6] The RAF as well considered their chances of meeting the Germans in the skies over England good, as they had at their disposal the Spitfire which had outfought the Me 109 over the British Army evacuation beaches at Dunkirk, France in May and June of 1940.

As the Battle of Britain began in July, German dominance was in question from the start. While the Me 109s shot down many British fighters, the Spitfire proved to be an equal match. A war of attrition of machines as well as pilots ended in late September with the RAF still in control of English skies and the threat of invasion of the British home islands averted.

An Asian-designed fighter etched its name in the American conscious on 7 December 1941. The Mitibushi A6M "Zero" provided protection for the Japanese dive bombers and torpedo planes in the attack on Pearl Harbor. The Zero, benefitting from nimble maneuverability and experienced combat pilots, dominated the U.S. Curtiss P-40 "Kittyhawk" and Gruman F4F "Wildcat" during the early stages of the conflict in the Pacific.

As the war intensified, so did the U.S. and German fighter design effort. The need for fighters that could perform a variety of missions became more evident. Air-to-air superiority was the dominant concern, but support roles such as bomber escort, night interception, strafing/bombing of troops and supplies and tank destroyers surfaced as the primary secondary functions. The U.S. put the twin-engined, twin-fuselage Lockheed P-38 "Lightning", the Republic P-47 "Thunderbolt" and the North American Aviation P-51 "Mustang" in the air to meet these needs. The Germans countered with upgraded versions of the Me 109s/110s and the newly introduced

Focke Wulf 190 (FW 190). The German design developments which revolutionized fighter design forever were in the form of the Messerschmitt Me 163 "Komet" and the Me 262 "Schwalbe".

The rocket powered Me 163 could achieve speeds approaching 600 miles per hour, but had a range of only 100 miles and a very limited armament capacity. The Allies had nothing comparable with which to defend their bombers from this craft. Fortunately only 300 Me 163s saw service by the end of the war and had the distinction of killing more of their own pilots than those of the Allies. Refinements to this speedy design, for which the Allies had no answer, could have been made but the Germans ran out of time and resources before the upgrades could be made.[7]

The Me 262 was a different story. The first jet-powered aircraft in the world to enter combat service, the Me 262 possessed two turbojet Junkers engines which produced a maximum speed of 520 miles per hour and climb/dive rates exceeding that of any design then in service. Armament consisted of four 30mm aerial cannons and the option existed for mounting 12 air-to-air rockets under each wing.

The Me 262 was tested and ready for delivery to Luftwaffe fighter squadrons by November of 1943, but due to Hitler's insistence that the design be modified to carry bombs, it was not delivered to the Luftwaffe's "Aces" squadron until late 1944. The combat performance of the Me 262s amazed USAAF personnel. Reports of how this aircraft would "blow by" escorting P-47s and P-51s and wreck havoc on U.S. bomber formations are countless. Due to Germany's fuel crisis in the twilight of the European war, many of the Me 262s produced never left the ground and were destroyed in low-level Allied fighter sweeps of German airfields. The technical data provided through the assessment of the few Me 262s captured on the ground by the Allied forces gave U.S., British and Soviet aviation engineers a head start in post-war jet fighter design.[8]

Post World War II

Five years after the end of World War II any fighter that lacked jet power was obsolete. The Korean War witnessed the sub-sonic, swept-wing Russian Mig-15 and North American Aviation's F-86 "Saber" as the primary state-of-the-art adversaries. In another

five years, supersonic fighters were ousting the earlier sub-sonic designs. Supersonic fighters such as the Russian Mig-21 and the U.S. F4 "Phantom" were the primary opponents during the war in Vietnam. Russian Mig-25s, 27s, 29s and the U.S. designed swing-wing F-14 "Tomcat", F-15 "Eagle" and F-16 "Falcon" implemented technological advances in avionics (aviation electronics) and weapons systems through the end of the Cold War.

Fighter aircraft design in the 1980s integrated technology anticipated for the combat environment of the 21st century. The introduction of the British Aerospace Harrier Vertical Take Off and Landing (VTOL) "Jump Jet" fighter in the early 1980s gave fighter aircraft a broader range of tactical ground support flexibility. The minimum take off and landing distance required by this aircraft allows it to operate in a more direct relationship with front-line ground forces. Also in the 1980s, the U.S. unveiled the F-117 "Nighthawk" stealth fighter. An unconventional design with dark coatings, peculiar aerodynamic angles and hidden engine/armament, the F-117 is impossible to detect with modern radar technology. It excels in nighttime precision attacks on high priority targets and was one of the primary systems employed by the USAF in the 1991 air war against Iraq.[9]

In the 1990s, U.S. conventional fighter design of craft like the McDonnell Douglas F-18 "Hornet" and the Lockheed F-22 "Raptor" has concentrated on the integration of advanced avionics such as computer chip driven heads-up pilot displays for flight and armament controls. The F-22, which can be flown and engage in combat through a pilot voice activated system, also incorporates thermoplastic airframe and wing covering intended to make the Raptor more "stealthy". The F-22 is expected to be the backbone of the USAF fighter squadrons for the next 30 years.[10]

NORTH AMERICAN AVIATION, INCORPORATED

North American Aviation, Incorporated (NAA) was formed as an independent aircraft manufacturer in 1934. NAA had previously been part of the Atlantic Aviation Corporation established as a aviation holding company by Clement Keys in 1924. Atlantic Aviation represented investment shares in Curtiss Aeroplane and Motor Company, Transcontinental Transport Incorporated and Douglas

Aircraft. In 1932, General Motors Corporation purchased a majority of NAA's stock from Keys, and in 1934, reorganized NAA, abandoned its facilities in Dundalk, Maryland and moved into manufacturing space near the edge of Los Angeles Municipal Airport in Inglewood, California with 85 transplanted employees.[11]

Former Douglas Aircraft engineer James H. Kindelberger was placed in charge of NAA operations. Kindelberger terminated NAA's concentration on commercial transport aircraft, believing military contracts were the future market potential. His vision paid dividends for NAA, as it became the largest volume U.S. aircraft manufacturer over the next decade through the production of more than 42,000 planes.[12]

The first NAA military contract in 1936 was for 42 U.S. Army Air Corps (USAAC) BT-9 basic flight trainers. The revenue from this contract allowed NAA to build a modern production facility in Inglewood. Throughout the late 1930s, NAA continued manufacturing the BT-9 and in 1940 was awarded contracts for the design and manufacture of the B-25 bomber. Fighter designs produced by NAA during this era, like the T-6 "Texan", were purchased by the USAAC for training purposes and the countries of Peru and Siam as frontline aircraft.

In early 1940, NAA was contracted by the British Purchasing Commission to manufacture the NA-73 fighter. The NA-73 would eventually evolve into the NAA's best known aircraft, the P-51 "Mustang". Between 1940 and 1945, NAA factories in Inglewood and Dallas, Texas produced 15,582 Mustang variants.[13] After World War II, NAA continued to concentrate on military designs and manufacturing contracts, producing the USAF's first four-engine jet bomber, the B-45 "Tornado", the F-86 "Saber" of Korean War notoriety, the first operational American fighter capable of supersonic speed in level flight, the F-100 "Super Saber". The X-15 rocket research aircraft was a product of NAA's Rocketdyne Division, which was established shortly after World War II.

In 1967, NAA merged with Rockwell Standard Corporation to form North American Rockwell Corporation (NARC). The merger combined two manufacturers specializing in military aircraft and general industrial manufacturing. Products of NARC included the Shrike, Commander 685 and Turbo Hawk Commander twin-engine business models,

the Quail, Sparrow, Snipe and Thrush Commander agricultural aircraft, the Darter and Lark Commander single-engined light planes and the initial design of the B-1 supersonic bomber.

In 1973, NARC changed its name to Rockwell International Corporation. Since 1973, Rockwell International Aerospace and Defense Divisions have been responsible for the design and production of the Apollo command modules, the current U.S. Space Shuttle Fleet, the B-1 bomber, the turboprop OV-10 "Bronco" armed reconnaissance plane and the Saberliner executive and light jet transport craft.[14]

Rockwell International sold its aerospace and defense interests to the Boeing Company in 1996. In 1997, Boeing merged with another aviation giant, McDonnell Douglas. Boeing and McDonnell Douglas currently produce Harrier, F-15, F-18 and F-22 fighters.

THE P-51

Development and Manufacture

Following the German invasion of Poland in September of 1939, British purchasing teams were in the U.S. within days seeking new fighters from American manufacturers, whose capabilities for mass production exceeded any similar concerns in Europe. The British settled on the Curtiss P-40 "Kittyhawk" and by early 1940 they had placed an order to the Curtiss-Wright Company of Buffalo, New York for as many as they could get. USAAC commanders were alarmed by this circumstance, as they realized the importance of building-up their pitifully numbered force and were not keen about letting significant production numbers of their primary fighter be committed to foreign powers.

In late 1939, the British Purchasing Commission (BPC) had anticipated the USAAC reaction to their aircraft appropriation scenario and began to search around for other U.S. manufacturers that might build the P-40 under license from Curtiss-Wright. Sir Henry Self, in charge of the BPC's New York office enjoyed good relations with NAA, who was building advanced training planes for both the British and the French. The initial approach by Self to NAA management to build P-40s was not taken very seriously.[15]

In January of 1940, Colonel Oliver Echols of the USAAC Experimental and Test Aircraft Section suggested to the BPC that it locate a manufacturer for production purposes that was not committed to high-priority U.S. government contracts. If this could be accomplished, the USAAC and Curtiss-Wright would make available all data they had on Curtiss-Wright's XP-46 experimental design so the British could purchase a new fighter aircraft. The XP-46 featured a laminar-flow wing, a streamlined fuselage and a scoop radiator housing under the fuselage for increased engine cooling capacity. NAA was again approached by BPC with a new proposal.

In May of 1940, NAA reached an agreement with Curtiss-Wright and the U.S. government to purchase the data on the XP-46 for $56,000 and to produce the aircraft, newly designated NA-73, under a Foreign Release Agreement. A formal contract for the production of 400 planes under the supervision of NAA Chief Designer Edgar Schmued was executed on May 23rd. Although no intermediate production deadlines were established, the first day of September 1941 was the date set by the British for final delivery.[16] Schmued, aerodynamic engineer Edward Horky and the rest of the NAA Inglewood design team began working seven days a week in order to get the prototype, the XP-73, produced. In September of 1940, the British were confident enough with the design specifications and initial ground testing to order an additional 300 planes. With an Allison V-1710 engine installed and test pilot Vance Breeze at the controls, the XP-73 made its first flight on 26 October 1940.

In December of 1940, the BPC wrote to NAA referencing the free-spirited mustang of the American plains as an apt namesake. The letter stated, "We are to inform you that the abovementioned aeroplanes (NA-73s) are to be given the official designation of 'Mustang'...".[17] It was British policy to designate their aircraft with a name as opposed to the numbering system used by the U.S. The British took delivery of their first Mustang in October of 1941.

The Mustang had displayed indifferent high-altitude performance with the stock Allison engine. Accordingly, the RAF assigned the new fighter to Army Co-Operation Command for low altitude attack and tactical reconnaissance missions. The first Mustangs were issued to No. 26 Squadron in February of 1942 and the first sorties were flown over France on 5 May. The first Mustang victory over a

German fighter, a FW 190, was credited to RAF "Eagle" Squadron Flying Officer Hollis H. Hills, a U.S. citizen from California, on 19 August 1942 while flying a sortie in support of the large scale British combined force raid on Dieppe, France.[18]

When the USAAC, newly designated the U.S. Army Air Force (USAAF), had approved construction of the NA-73 for the British in 1940, it had asked for the fourth and tenth production aircraft for testing purposes. The two planes were purchased in July 1940 and given the U.S. designation XP-51. USAAF bureaucratic procedures delayed initial testing at Wright Field in Dayton, Ohio. Neglect by the USAAF command to expediently evaluate test program data caused a delay in production, as money for fighter production in the Federal Fiscal Year 1942 (FY42) Budget ran out in May. But money still existed for ground attack aircraft production. In short order, wing ordnance pylons and dive brakes were added to the XP-51 design. Orders for 500 of the newly designated A-36 attack bomber were placed with NAA. With the advent of FY43, 310 P-51As were contracted for. By March 1943, the first USAAF P-51As were flying photo-reconnaissance missions out of North African airfields. The A-36s of the 27th Bomb Group were the first U.S. Mustangs to encounter the enemy in combat over Sicily on 6 June 1943.[19]

The British upgrade of the P-51A with the Rolls Royce-Merlin 61 engines improved the Mustang's performance at higher altitudes. The RAF loaned one of the Merlin-equipped Mustangs to the USAAF for testing, and the Americans soon integrated their own engine based on the Merlin design. This new power plant was the Packard-Merlin V-1650-3. With the V-1650-3 installed and the main coolant and after cooler radiators incorporated into the lower air scoop on the lower fuselage, the Mustang was designated the P-51B. Beginning in June 1943, 1,988 P-51Bs were constructed at NAA's Inglewood plant. Another 1,750 P-51Cs, an exact version of the P-51B, were manufactured during the same period at NAA's newly established plant in Dallas, Texas.[20]

The P-51B/Cs began arriving at the USAAF 8th Air Force VIII Fighter Command in England in September of 1943. The modifications incorporated into the P-51B/Cs made them an equal match in maneuverability with the German Me 109s and FW 190s at any altitude. As the USAAF had adopted the doctrine of strategic, daylight, precision bombing of German industry and military

installations, the Mustang was assigned the bomber escort role. Mustang modifications allowing for the mounting of two 75 gallon external fuel drop tanks on the wing ordnance pylons and the installation of an 85 gallon self-sealing auxiliary fuel tank at the rear of the interior main fuselage allowed the P-51B/Cs to accompany USAAF bombers much deeper into occupied Europe, but the additional weight seriously affected Mustang performance at altitudes above 25,000 feet and placed the airframe out of maneuver balance when fully loaded.[21]

To provide a "proof of concept" version, NAA produced a prototype Mustang in the fall of 1943 that would hopefully resolve the deficiencies of the P-51B/Cs. An upgraded Packard-Merlin engine, the V-1650-7 with an improved two-stage supercharger, increased Mustang performance. The upper portion of the rear fuselage was lowered and a "bubble" canopy installed to broaden the pilot's field of vision. The four Browning .50 caliber machine guns mounted in each wing section of the P-51B/Cs were mounted on their sides and had a tendency to jam. The prototype incorporated three guns in each wing section mounted upright to reduce malfunctions. The loss of firepower was somewhat negated by the ability of the new Mustang to carry 620 additional rounds of .50 caliber ammunition for a maximum load of 1,880 rounds. This Mustang variant was designated the P-51D.[22]

Mass production of the P-51D and the F-6D, and exact copy of the P-51D except for having a photo-reconnaissance camera mounted in the port aft section of the main fuselage, was commenced in April of 1943. The P-51Ds and F-6Ds began arriving at USAAF 8th Air Force Fighter Groups (FG) in the spring of 1944, but were not present in significant numbers until the late fall. The P-51Ds served the same functions as the P-51B/Cs, but long-range bomber escort and air superiority became their primary mission.

Even though the P-51D was considered the epitome of Mustang design, from the P-51s inception, engineers and pilots had advocated a lighter version. A lighter aircraft meant faster speeds with the elusive 500 miles per hour rate the goal. Edgar Schmued traveled to England and made a first hand inspection of the lighter weight Spitfires and captured Me 109s and FW 190s. Upon return, he developed designs for the XP-51F, XP-51G and XP-51J. The seven prototypes built had so many internal differences, they resembled

the original Mustang in only a superficial way. The resultant production model, of which 555 were manufactured, was designated the P-51H. Although it was much faster than the P-51D, it faced early directional stability problems, was not easy to maintain and was ill-equipped to operate from rough airfields. P-51Hs never saw combat service in World War II, but may have proved to be a formidable part of the USAAF arsenal had a final invasion of Japan been necessary.[23]

Two other versions of the Mustang were manufactured by NAA. Fifteen hundred P-51Ks were built at the Dallas plant in 1943/44. This model was identical to the P-51D except for incorporating an Areoproducts four-blade propeller. A long-range version of the Mustang, the P-82, was actually two Mustang fuselages mounted on an extended wing. The P-82 was constructed for use in the vast expanses of the Pacific Theater of Operations (PTO). Although the 272 P-82s produced saw no service in World War II, they did serve in the post-war years, including air-to-air combat in Korea.[24]

The Design Engineer

NAA Chief Designer Edgar Schmued was the man responsible for the general design, systems integration and modifications to all versions of the P-51. Although Schmued was also responsible for the design of the F-86 "Saber" and the F-100 "Supersaber", the P-51 was his first major project and the design he expressed the most pride in.

A self-educated engineer, Schmued left his native Germany for Brazil in 1925 with the objective of starting an aircraft manufacturing company, but could generate little investment interest. Returning to Germany, he worked as a field service representative for General Motors Corporation (GM) before emigrating to the U.S. where he was hired as a designer for Fokker Aircraft Company in New Jersey. He soon became Fokker's chief designer. Fokker Aircraft (U.S.) was bought out by GM in 1932 and the new acquisition was merged with GM's North American Aviation (NAA) Division. Moving to NAA's Maryland facilities, Schmued soon became a confidant of NAA's Chief Executive Officer James Kindelberger.

Schmued made the move with NAA to Inglewood in 1934 and worked on

trainer designs under NAA's U.S. government contracts. In June of 1940, Kindelberger assigned Schmued to head the design team for the XP-73, the prototype for the P-51. For the next five years, P-51 development and design modifications were Schmued's primary tasks. His constant effort in design refinement attributed to the versatility of the P-51 and its ranking as the highest scoring USAAF fighter in Europe with 4,950 confirmed enemy aircraft destroyed.

After World War II, Schmued continued with NAA, but left for the Northrop Corporation in the late 1950s where he was responsible for or contributed to the design of the T-38 "Talon" trainer and the F-5 "Tiger" fighter. Schmued eventually went into private consulting and served on the United States Air Force Scientific Advisory Board.[25]

Edgar Schmued died in June of 1985 in Oceanside, California at the age of 85. General James H. Doolittle, commander of the USAAF's 8th Air Force when the P-51 was at its zenith, provided the following remarks at Schmued's memorial service, "All of us who had the good fortune to know, and to know was to admire, Ed Schmued miss him profoundly. His contributions to aviation were manifold. A very important one was production of the P-51 Mustang. It played a very important role in enabling the USAAF to achieve control of the air over Germany."[26]

At the Front

Air Strategy in Europe

At the end of World War I, air power pioneers in the U.S. and Europe, notably Billy Mitchell and Lord Trenchard, placed a great deal of emphasis on the potential of strategic bombardment based on Italian air war theorist Giulio Douhet's principle: Take long-range bombers and hit the enemy's war-making potential behind his own lines. In accordance with Douhet's theory, the bomber was considered the dominant air weapon among USAAC strategic doctrine developers during the 1930s. There were some notable exceptions to this thinking, foremost being USAAC Captain Claire Chennault of later "Flying Tiger" fame, who advocated the use of fighter planes for attack of airborne bomber formations. Chennault's theory was brushed aside as fighters of the era were slower and not as well

armed as the bombers. It was firmly believed by high-level USAAC strategists that the only way to destroy a large air armada was on the ground by saturation bombing. The fighter was considered strictly a defensive weapon.[27]

As World War II in the European Theater of Operations (ETO) got underway, the British adopted Douhet's principle and began limited night raids against industrial targets inside Germany. The raids had less than desired affects due to the inability of the British to bomb accurately during periods of reduced visibility. The reason for the night raids, enemy fighters. Daylight raids with lightly armed/armored and unescorted British bombers had resulted in heavy losses at the hand of the German Me 109s and Me 110s.

When USAAF strategic bombers deployed to England in 1942, it was thought that the heavily armed B-17s and B-24s, each containing over ten Browning .50 caliber machine guns, could fend off the German fighters in the scenario of daylight precision bombing. Although the Luftwaffe fighters found it more difficult to close on the USAAF bomber formations, they simply changed their tactics and began attacking the bombers from their most vulnerable defensive quarter, head on. This disrupted the accuracy of the bomb payload impacts, as the straight and level flight path needed over targets was interrupted by the evasive maneuvers required by the bomber pilots to prevent the loss of their plane and crew. The solution to this dilemma was to produce a fighter to escort the bombers all the way to their target and defend against enemy interdiction.[28]

This need for long-range escorts had not escaped the attention of Commander of the USAAF General Henry H.(Hap) Arnold. In early 1942, Arnold ascertained from previous British air operations that an escort fighter was needed to defend the American bombers if the daylight bombing doctrine was to be successful. The ranges of the fighters, primarily the P-40, P-47 and the P-38, in the USAAF inventory were just not sufficient to accomplish this task. Additional pressure from all overseas theater commanders and the USAAF Ferry Command in the U.S. to produce fighters with extended range led Arnold to direct USAAF Material Command to develop a solution. Manufacturers experimented with internal and external fuel tank configurations for all serviceable fighter models. By the fall of 1943, it was apparent the answer to the long-range escort problem was the P-51B/C.

In November of 1943, long-range escort became official USAAF doctrine, but the policy of defensive fighter support for the bomber formations was the accepted practice. Waiting for the German fighters to attack the bombers was frustrating for the U.S. pilots who, with the arrival of the P-51B/C, knew they had an aircraft superior to anything the Germans could put in the air. As long as the P-51s had to fly in formation and at the same speed of the bombers, they were at a serious disadvantage when they were "jumped" by the Me 109s and FW 190s. When Lieutenant General James H. Doolittle took command of the 8th Air Force in January of 1944, fighter-escort doctrine emphasizing offensive tactics was implemented, allowing the escorts to engage the enemy fighters as they were preparing to attack the bomber streams. Luftwaffe Fighter Chief Adolf Galland stated that, "The day that the USAAF fighters took the offensive was the day that Germany lost the air war."[29]

Even though German fighter production in 1944 was at an all time high, American pilots in the newly arriving P-51Ds went on a killing spree that did not end until there were virtually no German fighter pilots left to crew the planes rolling off the assembly lines. The bomber offensive against the German aircraft and engine industry was not viewed as the watershed in this struggle. Elimination of aviation gasoline production facilities and combat attrition of Luftwaffe pilots were the primary factors in winning the air war over Germany.[30]

The only adjustment in USAAF tactical doctrine after the adoption of the long-range escort offensive approach was what is considered a complete fighter offensive methodology. USAAF commanders participating in the planning for the invasion of France decided to integrate dual mission roles for the P-51s and other U.S. fighters escorts in which, once the bombers they were escorting were returning to base and relatively out of harms way, the escorts would break-off and attack German strategic and tactical ground targets, either designated or purely opportunistic. So successful was this tactic prior to the June 1944 invasion, it became USAAF standard operating procedure the rest of the war.

The Mediterranean

The introduction of the Mustang into USAAF combat units in the Mediterranean Theater of Operations (MTO) in June of 1943 was welcomed by commanders and pilots alike. With the Mustang, commanders had a fighter with the range to escort bombers all the way to targets in Central Germany and Southeastern Europe. The P-51 was a major factor in reducing the losses of the MTO's 12th and 15th Air Force's strategic bombing contingent, whose replacement priority was second to that of the 8th Air Force in England.

One of the most notable units in the MTO to fly the Mustang was the Italian based 332nd FG. The 332nd FG was comprised of the 99th, 100th, 301st and 302nd Fighter Squadrons (FS), whose pilots were all graduates of the USAAF's Tuskegee Experiment, the first flight school in the segregated U.S. military for African Americans. The 332nd FG, who never lost a bomber it escorted to enemy fighters, received P-51Bs in the spring of 1944, and P-51Ds as replacements in early 1945. The P-51s of the 332nd FG were easily recognized by their distinctive red painted rudder and vertical stabilizer.

The 332nd FG's primary mission was to escort bombers striking the German oil refineries at Polesti, Rumania and to engage German ground targets along the southern coast of France prior to the Allied invasion there in August of 1944. Later in the war, the unit escorted bombers to targets in southern and central Germany.[31] One of the high points in the 332nd FG's history occurred during an escort mission to Berlin on 2 March 1945, when pilots in P-51Ds of the 100th FS shot down three German Me 262 jet fighters. On 26 April 1945, the 332nd FG's P-51Ds claimed the last four enemy aircraft destroyed in air-to-air combat in the MTO.[32]

Central Europe

When the first USAAF P-51 arrived in England for assignment to the 9th Air Force's 354th FG, the air war over central Europe changed dramatically. The superior speed and maneuverability over enemy fighters became quickly evident as squadrons of the 8th and 9th Air Forces began to fill their ranks with the P-51. At full strength with P-51B/Cs prior to the Normandy invasion in June of 1944, the USAAF fighter squadrons began to dominate the skies over the continent. Each squadron was composed of 16 to 24 planes and

generally all the squadron aircraft would participate in assigned missions. Although some fighter squadrons of the 8th and 9th Air Forces continued to fly the P-47, the arrival of the P-51D in March of 1944 brought to the European Theater of Operations (ETO) the fighter that, with its upgraded performance levels and integrated systems improvements, would destroy German resistance in the air.

While the P-51D was a superior performer to all Allied and Axis piston-powered aircraft in the ETO, the introduction of the German jet fighters in the fall of 1944 presented a new dilemma for Allied commanders. Fortunately, the P-51D proved to be the very tool necessary to deal with the German jets.

In late 1944, fighter squadrons of the 8th Air Force were taxed with developing a strategy on how to eliminate the threat of the Me 262. Through the research of intelligence records covering how/where it was built, where they were based, when/how the pilots were trained, how it was stored, where its fuel came from and general performance data, the 339th FG settled on the strategy of attacking the Me 262s at their airfields.

The plan was for a squadron of P-51Ds to make low level attack under the respected and very accurate German flak (anti-aircraft fire) with the intention of flushing the Me 262s off their airfields and into the sights of another squadron of P-51Ds flying high cover. The Me 262 was known to be very slow and thus, less maneuverable during take-offs and landing approaches. Caught in this predicament, it was reasoned the Me 262s could be easily destroyed before achieving speeds that would leave the Mustangs in their vapor trails. Once this strategy was implemented, the 339th FG found that the Me 262s were not inclined to evacuate their airfields. The 339th adjusted their approach by shooting-up the Me 262s on the ground and setting their support facilities afire. After about twenty minutes, the attacking squadron would withdraw for their home base, while a flight of eight Mustangs was left loitering in the area to knock down any Me 262 that had been missed and was trying to land back at its home base. In three missions such as this, the 339th FG destroyed 14 Me 262s in the air and 26 more on the ground.[33]

Jet killer, tank destroyer, locomotive impaler, troop strafer and photo-intelligence gatherer, the P-51 Mustang performed these duties and more in the ETO, but it was its job as a long-range escort for USAAF bombers pulverizing German industry it will most be remembered for. Credit for ending the air war can be attributed to various quarters, such as strategic bombing and air crew training/experience, but the affect of the P-51s getting the bombers to their targets with minimum interference made the difference.

When Luftwaffe Reichsmarshall Hermann Goering was asked at what point he realized Germany would lose the war, he replied, "When they (bombers) came with fighter escort to Berlin." The date of that raid was 4 March 1944 and the fighter escorts that signified defeat to Goering were the red nosed P-51 Mustangs of the 8th Air Force's 4th FG.[34]

China-Burma-India/Pacific Islands

Primarily gaining fame in Europe, Mustangs served in every theater of combat during World War II. Even though the British debuted the Mustang over France in May 1942 and the USAAF introduced the A-36 dive bomber version of the P-51 with the 10th Air Force in June of 1943, it was autumn of 1943 before the A-36s and P-51As of the 311th Fighter Bomber Group appeared in the China-Burma-India (CBI) Theater. The 23rd Fighter Group (FG), which was able to trace its lineage directly to the "Flying Tigers" of the Chinese Air Force, received P-51Bs in early 1944. The primary missions of Mustangs in the CBI Theater was to support the effort on the ground and long-range escort of the B-24 "Liberator" and the B-25 "Mitchell" bombers. Late war production of the P-51D was increased to supply the 530 planes a month required for the CBI command.[35]

It was late 1944 when the first P-51Ds were assigned to the Pacific Islands with the 35th FG and the 71st Recon Group. Their primary duty was escort for B-29 "Superfortress". In March of 1945, P-51Ds from 15th FG arrived at south field on Iwo Jima to support U.S. ground forces still fighting to secure the island. P-51Ds flew their first B-29 escort raid over Japan on 7 April 1945.

By the time the Japanese surrendered in September of 1945, there were twelve Mustang Fighter Groups assigned in CBI and the Pacific

Islands. The Mustang did not really make its presence felt in the Pacific air war. The notoriety in the Pacific War rests with the F4U "Corsair", F6F "Hellcat", P-38 "Lightning" and P-40 "Kittyhawk" fighter planes. The mission for the Mustang was on the other side of the world.[36]

Post-World War II

After World War II, the nine USAAF P-51D FGs in Europe and five in the Pacific were assigned to occupation duties and served in this capacity through the replacement period that provided F-80 "Shooting Star" jet fighters to the USAF. The Swedish Air Force put to use 50 Mustangs that had been interned during the war and the RAF continued using the Mustang through 1946. Many of the USAAF Mustangs were delivered to salvage centers overseas and in the U.S. for scrapping and use as spare parts. The last blocks of NAA's -20, -25 and -30 production series P-51Ds were never shipped overseas and made up the main force of the USAAF's stateside units.

The Commonwealth of Australia was granted a license to manufacture 200 P-51Ds at the conclusion of the war and the Rio Pact of 1947 allowed for the export of excess and obsolete war goods to the countries of South and Central America. Many of the war weary P-51s were rebuilt, overhauled and sent south. Sweden sold 25 of its interned Mustangs to Israel and a token force of P-51Ds served in the Swiss Air Force.[37]

The realignment of the U.S. military after World War II included the formation of a reserve air arm as part of the National Guard. Federal recognition and establishment of this branch did not get fully underway until 1947. Fighter units east of the Mississippi River received the P-47 "Thunderbolt" and the units to the west the Mustang. Seven hundred P-51Ds were initially assigned to the National Guard air organization.[38]

Korea

The outbreak of the Korean War in June of 1950 brought about the need for a military build-up and the Mustang was once again called to active service. Eighty National Guard P-51Ds were flown to San Francisco and shipped on the U.S. Navy aircraft carrier *Boxer* to Itazuke airbase in Japan. USAF P-82 Mustangs operating out of

Itazuke had scored the first kills in the Korean War, downing three Russian made YAK fighters during the first week of the war.

The newly arrived National Guard P-51Ds and the resident P-82s at Itazuke formed the 8th, 18th and 35th Fgs of the 8th Fighter Wing (FW) and moved to airfields at Kimpo, Pusan and Pohang, Korea in the fall of 1950. Ten of the 8th FW Mustangs were stripped of their markings and assigned to the Republic of Korea Air Force at Taegu. The P-51Ds of 2nd Squadron, South African Air Force and 77th Squadron, Royal Australian Air Force augmented the U.S. units during the war. The Mustang squadrons were assigned to the USAAF Tactical Air Command and were employed almost exclusively in ground support roles until the end of the war in 1954.

Retirement

At the conclusion of the war in Korea, the P-51s found themselves back with the stateside National Guard units or headed to the salvage/scrap centers. On 1 March 1957, the last Mustang in active USAF service, F-51D-30NA 44-74936 was flown to Wright-Patterson Air Force Base, Ohio to be interred at the Air Force Museum. The Nationalist Chinese and various South American Air Forces used the P-51D through 1958. The last known action seen by a P-51D was during the uprisings in the Dominican Republic in June of 1966.[39]

Recreation

Unlimited Air Racing

Shortly after World War II, U.S. government war surplus sales made a mass of military equipment available at auctions and base closure sales. The desires of a few sportsmen and racing enthusiasts were fulfilled with the availability of excess P-51s to the general public.

Surplus Mustangs entered the Van Nuys to Cleveland National Air Races of 1946 and finished in the top four positions. In the 1946 Thompson Trophy Event, pylon racing over a thirty mile course, the P-51s were less competitive finishing in the middle of the pack of the closed circuit participants. During the ensuing years, the P-51s continued to surpass their competition in the long-range events and achieved moderate success in the 1948 pylon racing season due

to modifications which included wing mounted radiators. The National Air Races were shut down by the Civil Aeronautics Administration in 1949 when P-51C racer William Odom crashed into a residential area in Berea, Ohio resulting in his demise and the death of two residents. The Mustang racing owners retired their planes to storage or sold them for parts and scrap.[40]

In 1964, the National Air Races were revived in Reno, Nevada and once again, the Mustangs were brought out of storage. Its primary competition was the Gruman F8F "Bearcat". The P-51s managed to win the long distance leg of the race, but were still lacking performance on the pylon racing circuit. The National Championship Air Races at Reno, considered the Indianapolis 500 of Unlimited Air Racing, continues to the present and still has highly modified Mustangs as front runners.

Restoration

All of the remaining P-51s exist because some entity, museums, aircraft preservation societies or private individuals, have taken it upon themselves to expend the time and resources to preserve one of aviation history's truly remarkable aircraft.

As the P-51 ended its operational service in the mid-1960s, "Warbird" enthusiasts dedicated to restoring Mustangs to their World War II appearance and configuration began acquiring many of the remaining planes and spare parts. Their objective is not only historical restoration but, in most cases, bringing the aircraft back to full operational status. This "hobby" is not without its rewards. The personal satisfaction of preserving a valued piece of history is a prime motivator for most, as well as the opportunity to display their P-51s at air shows for the enlightenment of the general public.

Official recognition for restoration efforts is available through the Experimental Aircraft Association's (EAA) Warbirds of America competition held annually at the Oshkosh, Wisconsin National Air Show and the Sun and Fun Air Show in Lakeland, Florida. Preserved and restored Warbird fighters, bombers and transports are meticulously judged for accuracy and integrity. To be named Grand or Reserve Champion or even be recognized in this competition is a major accomplishment considering the expertise and seriousness of

the competitors.

Some P-51 owners are not part of the Warbird Association, but have undertaken restoration and modification of their planes purely for their own flying pleasure. Whatever the reasoning behind restoration, this vocation has not only provided opportunities for the owner/restorer but has given rise in recent years to specialty firms capable of manufacturing or locating parts for this endeavor. Through the combined effort, there exists approximately 160 airworthy Mustangs in the world today.[41]

The Pilot's Perspective

The pilots who flew the P-51 when it was state-of-the-art technology can offer valuable insight on the aircraft. Military or civilian, Mustang aficionados are sincere in their comments and are not above issuing criticism when warranted.

USAF General Chuck Yeager, who in October of 1947 became the first pilot to break the speed of sound, flew P-51Bs and Ds with the 8th Air Force's 363rd FS during 1944/45. Yeager was an "Ace", having scored five enemy air victories, and was credited with 11.5 enemy planes destroyed during his tour with the 363rd. He was the first USAAF pilot to score five kills in one day. He remembers his Mustang, the Glamorous Glen, as, "...the best American fighter in the war...a dogfighter's dream." Yeager also expressed his misgivings about the P-51 by stating, "Loaded with fuel and ammo, she's a tricky plane to fly, and also very vulnerable. Get hit in your radiator and lose your coolant, and you are going down."[42]

Captain Robert J. Goebel flew 61 missions in P-51B/Ds with the 15th Air Force's 308th FS in the Mediterranean Theater of Operations during 1944. Goebel was impressed by the speed of the Mustangs, especially in dives, and "...the landing gear being so sturdy that it took a lot of doing to screw up a landing..."[43] Another Italian based pilot, Tuskegee trained Lou Purnell of the 332nd FG, evaluation of the Mustang was similar to Goebel's praise. Purnell stated, "It was like dancing with a good partner. You could almost think left turn, and the damn plane was right with you. Good response on controls, good stability. The cockpit was designed beautifully. Where you expected to find something, you'd find it."[44]

Women's Airforce Service Pilots (WASP) were part of the USAAF Air Transport Command and did much of the state side ferrying of aircraft from the factories to overseas transportation depots. WASP Jean Landis was assigned to fighters for most of her wartime career and was very impressed by the P-51. "The P-47 was a bucket of bolts compared to the Mustang; it was too heavy and sluggish. But when you got into a Mustang, it felt like you had just strapped the wings on. You didn't feel you had any fuselage around your body, you were part of the airplane."[45]

Enemy pilots were equally impressed with the P-51. Lieutenant Yohei Hinoki of the 3rd Chutai (FG), 64th Sentai (FS), first encountered and scored an aerial victory against a P-51 over Burma on 25 November 1943. Hinoki could tell from a distance that the two Mustangs he was closing on were very advanced aircraft that moved exceptionally fast. Back in Japan in 1944, Hinoki examined and flew a captured Mustang at Omasa Airfield. "I could see the superiority of its equipment, especially the bullet-proof glass, armor plating and oxygen system. Overall it was better equipped than any Japanese airplane I had ever seen."[46]

Several experienced Luftwaffe pilots had the opportunity to fly captured Mustangs, including 275-victory ace Major Gunther Rall. Rall professed, "...what impressed me was the comfort in the cockpit, the ease of the electrical starting system, the long endurance of the aircraft and its maneuverability in a dogfight. However, the Me 109 was superior in all steep climbing turns, in which the Mustang had a tendency when low on speed to snap over on the outer wing." Overall, the German pilots were impressed by the Mustang and, like their Japanese counterparts, considered it the best all-around fighter of the war.[47]

U.S. ARMY AIRCRAFT P-51D-25NA 44-73287

U.S. Army Aircraft P-51D-25NA 44-73287 was manufactured as a fighter aircraft for the U.S. Army under U. S. government contract number AC 2378 in Fiscal Year 1944 and was assigned Army serial number 73287. 44-73287 was constructed by North American Aviation, Incorporated at its Inglewood, California facility and was assigned the North American constructor number of 122-39746. Completion date for this aircraft is 7 June 1944.

44-73287 was accepted by the Army on 7 March 1945 and departed for the USAAF's 8th Air Force Fighter Command, European Theater of Operations, on 13 April 1945. It is not known if 44-73287 was assigned to an 8th Air Force squadron or held at the replacement depot. On 18 July 1945, the aircraft was shipped back to the U.S. and subsequently assigned to the 4108th Base Unit at Newark Field, New Jersey in September.

Assignment to the USAAF's 20th Fighter/Bomber Wing took place in April of 1947, with transfer to the 4126th Base Unit at San Bernadino Air Force Base (AFB), California in May of 1948 for instruction and storage. While with the 4126th, it was redesignated by the re-organized USAF a F-51D model. In November of 1948, 44-73287 was assigned to the USAF's New Mexico Air National Guard's (ANG) 188th FS at Kirtland AFB, New Mexico.

With the advent of the Korean War, 44-73287 returned to active duty with the USAF's Air Defense Command in February of 1951. Its activated New Mexico ANG unit was redesignated the 188th Fighter/ Interceptor Squadron, which was transferred to Long Beach, California in May. 44-73287 was transferred to the 4750th Air Base Squadron at Yuma AFB, Arizona in July and served there until July of 1954. At that time, 44-73287 was assigned to the 165th Fighter Bomber Squadron of the Kentucky ANG located at Standiford Field in Louisville, where it served until September of 1956. At that juncture, it was flown to the Sacramento Air Material Area, McClellan AFB, California for reclamation. In June of 1957 it was grounded as excess (surplus). On 11 December 1957, 44-73287 was dropped from the USAF inventory and sold to its first civil owner.[48]

The man who saved 44-73287 from the scrapper's cutting torch was William Kelbaugh of Chino, California who paid the USAF $957.95 for the plane.[49] Kelbaugh sold the aircraft to William Sherman Cooper of Merced, California for $1,500 in April of 1964.

While in Cooper's possession, 44-73287 participated in the sport of Unlimited Air Racing. Piloted by Bill Jackson and competing against "Bearcats", "Corsairs", "Lightnings", "Sea Furies" and other P-51s, 44-73287 flew in the United States Cup 1,000 mile pylon race at Brown Field in San Diego on 18 July 1971. 44-73287 finished eleventh in a field of thirteen after withdrawing on lap

49 with an overheating engine. Cooper won the race piloting a "Sea Fury". 44-73287 raced again on 14 November 1971 at the second California 1,000 at Mojave. The race, conducted on a fifteen mile pylon course with fourteen competitors, was won by a "Sea Fury". 44-73287, with Jackson once again at the stick, finished third.[50]

In July of 1973, the aircraft was purchased from Cooper's estate by James Francis of Medina, Ohio for $32,975.28. The plane was sold again in 1978 when it was acquired by Courtesy Aircraft of Rockford, Illinois for $54,402.07. Courtesy Aircraft sold the plane to Jack Rose of Spangle, Washington in 1982.

Rose, an 8th Air Force enthusiast, undertook the task, with the help of his wife, to restore 44-73287 to a World War II era interpretation in both appearance and systems accuracy. No elaborate restoration contractors were needed or used during the process, as the aircraft retained a high percentage of its original materials and equipment integrity. Rose's primary contribution was restoring interior paint finishes, cockpit equipment and applying the current USAAF 503rd FS paint and stencil markings. The individual aircraft "Worry Bird" designation was applied to honor a Spokane acquaintance of Rose, Bob Frisch, who had flown the "Worry Bird" with the 503rd in 1944/45. Rose's efforts earned the plane the EAA's Warbirds Reserve (2nd place) Grand Champion Award at the Oshkosh National Air Show in 1984.[51]

44-73287 was sold by Rose to John Castrogiovanni of Rockford, Illinois in 1985. The aircraft was purchased from Castrogiovanni in 1988 by Victor Haluska of Santa Monica, California, who sold the aircraft in 1989 to current owner Mike George of Springfield, Illinois.

George, an aviation enthusiast from an early age, had always wanted to own a P-51 "Mustang" for his personal flying pleasure. The chance to own a P-51 that had been restored to World War II era interpretation was even more appealing. When "Worry Bird" came under Mike's ownership, he developed a comprehensive restoration plan to return the aircraft to original North American Aviation, Inc. factory specifications. An exhaustive effort was put into motion to locate original parts to restore machine gun bays and cockpit elements. External 75 gallon drop tanks were also located and purchased. The effort paid off, as the "Worry Bird" received

the EAA's 1993 Preservation, 1995 Best Mustang and 1995 Silver Wrench Awards at Oshkosh and was named the 1995 Warbird Reserve Grand Champion at the EAA's Sun and Fun Air Show in Lakeland, Florida.

44-73287 primary, contemporary function as a high performance single engine aircraft is consistent with its original design. Its intended use by the U.S. military as a fighter/bomber was fulfilled until it was excessed in 1957. In civil use, it has functioned as a racing aircraft and an educational resource relating to aircraft design and military history. The aircraft currently functions as a static and operational exhibit in its permanent setting at the Air Combat Museum in Springfield, Illinois as well as other locations throughout the U.S.

SURVIVING P-51 AIRCRAFT

As with most aircraft, it is difficult to determine how many P-51 "Mustangs" remain in the world. Sources consulted present various data, with some reflecting on purely operational planes and others counting fuselage remains as survivors. The surviving number also deviates as portions of P-51s are located in storage and are restored to presentation or operational status.

Of the 15,582 P-51s manufactured by North American Aviation, Inc. between 1940-45 and the 200 built under license in Australia near the end of World War II, data compiled by the editors of FlyPast magazine in 1997 indicates that there are 233 P-51s remaining in the world. Of this number, 195 are based in the U.S. These numbers include all variants and takes into account the operational status, i.e. flying, static, under restoration. Approximately 149 world-wide P-51s are operational, with 124 of these being in the U.S.

When examining the P-51D, the most numerous produced variant of the P-51 design, the ratio of existing and operational planes is consistent. One hundred and ninety, of which 124 are operational, exist world-wide. One hundred and sixty six P-51Ds, of which 104 are operational are located in the U.S. Eleven P-51s exist within the state of Illinois, six being operational. All of the operational planes in Illinois are P-51Ds, except for one F6-D and

one P-51K.[52] Longtime P-51K owner Vlado Lenoch of LaGrange, Illinois sets a realistic contemporary figure for surviving aircraft within the state of Illinois at two P-51Ds, one P-51K and one F6-D. All of these P-51 variants are operational. Lenoch indicated that some of the P-51s listed in Illinois are only registered there and are based elsewhere.[53]

Surviving P-51s are used for a variety of functions including personal transportation, recreational flying, Unlimited Air Racing and historical interpretation.

SUMMARY

P-51D-25NA 44-73287 is a superb example of the P-51 "Mustang" aircraft design which was instrumental in wining control of hostile air space during the Second World War. 44-73287, being a "D" variant P-51, is the epitome of the design which was the most advanced piston-powered, single engine fighter aircraft ever produced. The engineering characteristics of this design allowed it to perform a variety of functions for the military and to cross-over to civil recreational use when it became technically obsolete for military duties.

For the purposes of this nomination, the significant dates for 44-73287 under the area of military history terminates in 1948. It should be emphasized that this aircraft, as well as other P-51Ds, continued to be one of the front line fighter aircraft for the USAF until the outbreak of the Korean War in 1950. At that time, it became obvious that the P-51D was outclassed by adversarial air superiority aircraft. Even though the P-51Ds of the USAF were thereafter relegated to ground support, photo reconnaissance and training missions, they continued to be a significant asset to the U.S. military until their eventual permanent retirement in the late 1950s.

Aircraft 44-73287 itself possesses an exemplary degree of integrity in design, setting, materials, workmanship, feeling and association and has been part of the military and civil saga of the P-51.

44-73287 is a worthy resource for recognition and inclusion in the National Register of Historic Places. 44-73287 is also a viable

candidate for designation as a National Historic Landmark in that it possesses exceptional value in illustrating and interpreting the heritage of the United States in history and technology. This aircraft design is associated with the USAAF effort to achieve air superiority during World War II and is a crucial resource for understanding the successful results attained by the USAAF in the European Theater of Operations. This design also embodies distinguishing characteristics of combined aviation engineering systems valuable for the study of mid-20th century U.S. state-of-the-art fighter aircraft technology and methods of construction.

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43. Robert J. Goebel, Mustang Ace (Pacifica, California: Pacifica Press, 1992), 73.

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46. Ibid, 120.

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VERBAL BOUNDARY JUSTIFICATION

U.S. Army Aircraft P-51D-25NA 44-73287 has a wingspan of 37.03 feet, a fuselage length of 32.3 feet and a height of 6.3 feet at the verticle stabilizer. When not attending air shows or on display at other locations, P-51D-25NA 44-73287 is located at the hangar complex of the Air Combat Museum at Capital Airport in Springfield, Illinois.

BOUNDARY JUSTIFICATION

The boundary for U.S. Army Aircraft P-51D-25ND 44-73287 is the space this aircraft occupies, terminating at the farthest extent of its dimensional limits. This resource is inherently mobile and subject to periodic movement. The ability of this aircraft to convey its significance for engineering is enhanced by its operational (mobile) capabilities.

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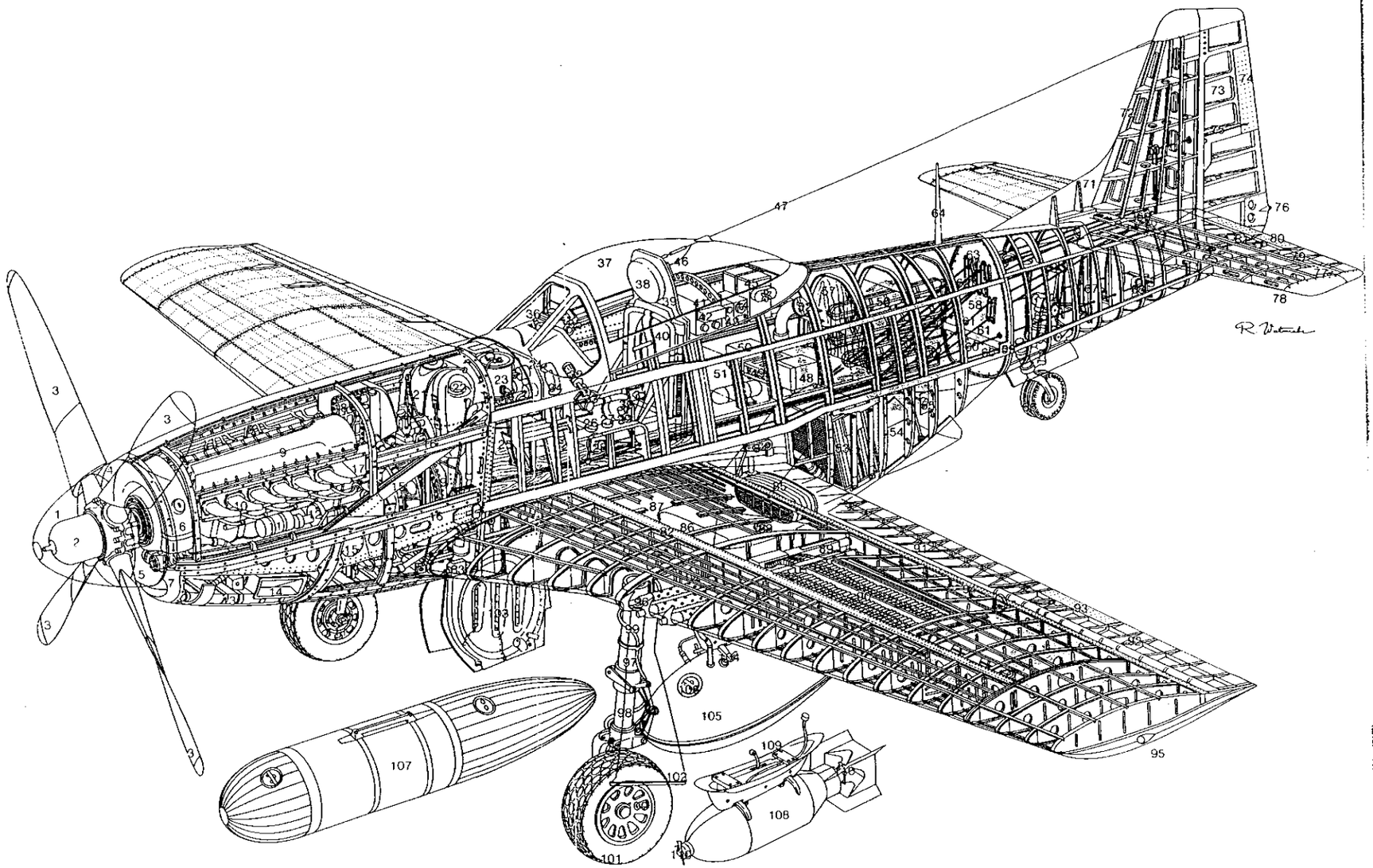
P-51D Cutaway



1 Spinner
2 Propeller hub
3 Four-blade Hamilton Standard Hydromatic propeller
4 Armour plate
5 Propeller governor
6 Coolant header tank
7 Carburettor air intake
8 Engine leads
9 Packard (Rolls-Royce) Merlin 61 series V-1650-7 engine (1,450-hp)
10 Exhaust pipes
11 Generator
12 Aftercooler pump
13 Air duct
14 Air filters
15 Engine bearer assembly
16 Cowling panel frames
17 Magneto
18 Engine aftercooler
19 Carburettor
20 Oil inlet line
21 Oil tank
22 Filler cap
23 Hydraulic reservoir
24 Instrument panel
25 Rudder pedal
26 Aileron trim tab control knob
27 Rudder trim tab control knob
28 Elevator trim tab control knob
29 Carburettor hot air control lever
30 Carburettor air intake control lever
31 Signal pistol discharge tube
32 Throttle lever
33 Propeller control lever
34 Control column
35 K-14A gun sight
36 Laminated glass windscreen
37 Bubble-type canopy
38 Head rest
39 Head/back armour plate
40 Pilot's seat
41 BC-457 transmitter
42 BC-451-A transmitter control box
43 BC-453 receiver
44 BC-454 receiver
45 Battery
46 BC-442 antenna relay
47 SCR-274-N antenna
48 BC-458 transmitter
49 SCR-515-A radio set
50 BC-455 receiver
51 Fuselage auxiliary fuel tank, capacity 85US gallons (322 ltr.)
52 Fuel filler cap
53 Coolant radiator assembly
54 Ventilation flap
55 Oxygen filler valve
56 Low pressure oxygen bottle
57 Radio bay aft plywood bulkhead
58 Fuselage aft bulkhead/breakpoint
59 Lifting tube
60 Rudder control cable
61 Rudder trim tab control cable
62 Elevator trim tab control cable

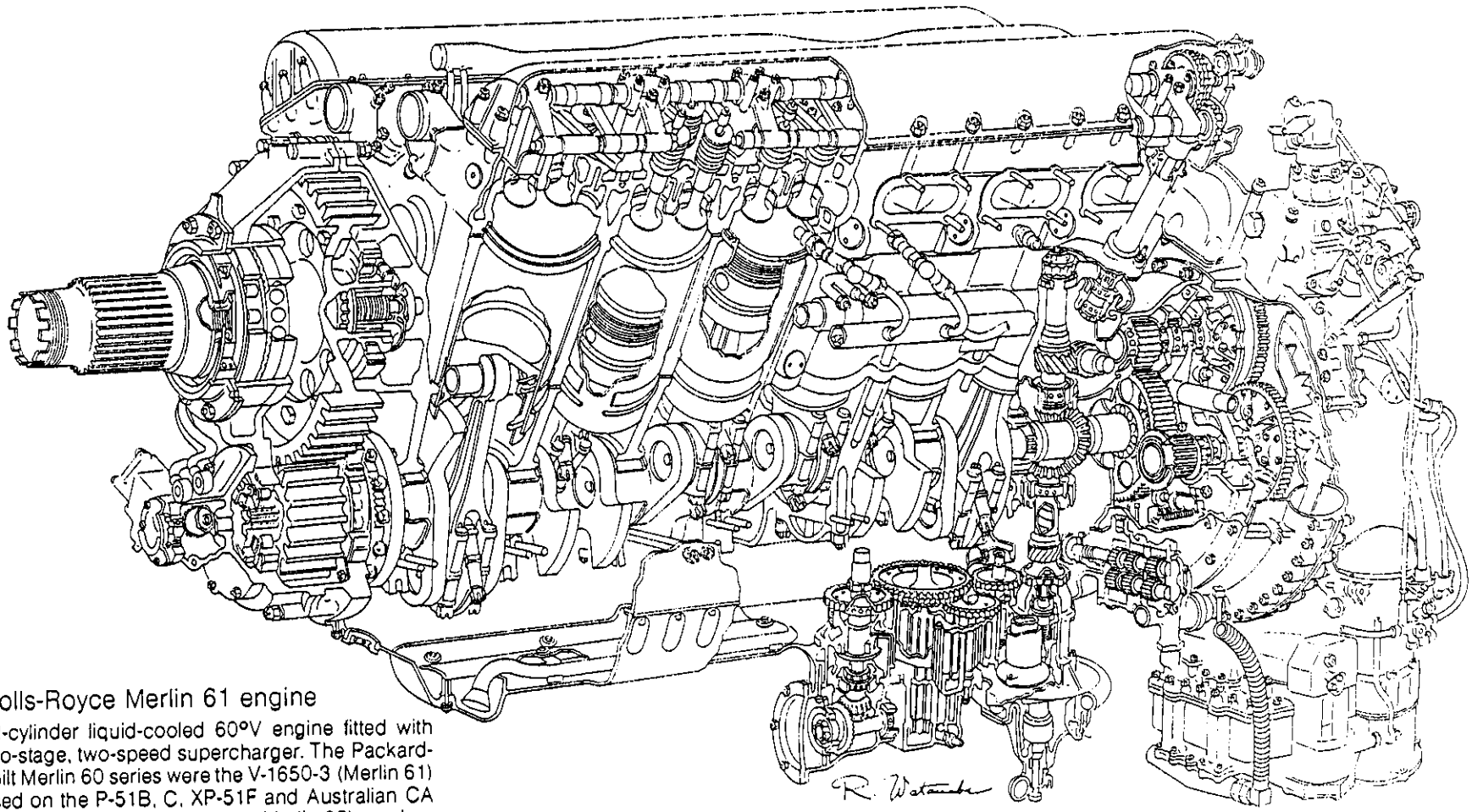
63 Control cable pulley brackets
64 Antenna mast
65 Tailwheel retraction mechanism
66 Forward-retracting tailwheel
67 Tailwheel steering mechanism
68 Rudder actuating bellcrank
69 Elevator operating horns
70 Rudder trim tab actuating drum
71 Dorsal fin
72 Vertical stabilizer
73 Rudder

74 Rudder trim tab
75 Rudder trim tab control link
76 Rear navigation light
77 Elevator balance weight
78 Horizontal stabilizer
79 Elevator
80 Elevator trim tab
81 Elevator trim tab control link
82 Main spar
83 N-6 gun camera
84 Flap control linkage

85 Oil radiator
86 Ventral air intake
87 Wing fuel tank, capacity 92 US gallons (348 ltr.); total 184 US gallons (696 ltr.)
88 Fuel filler cap
89 Browning 0.50-in (12.7mm) machine-gun
90 Ammunition boxes
91 Flap
92 Aileron

93 Aileron trim tab
94 Wing rear spar
95 Navigation light
96 Blast tube (inboard guns only)
97 Main landing gear
98 Shock strut
99 Brake tube
100 Main wheel, 27in (68.6cm)
101 Tire, smooth contour, 27in (68.6cm)
102 Main landing gear cover

103 Main wheel cover
104 Pylon
105 Auxiliary fuel tank, metal, 75 US gallons (284 ltr.)
106 Fuel filler cap
107 Auxiliary fuel tank, plastic-pressed paper, 108 US gallons (409 ltr.)
108 Bomb 500 lb (227 kg)
109 Bomb rack
110 Fuse
111 Disc-type brake

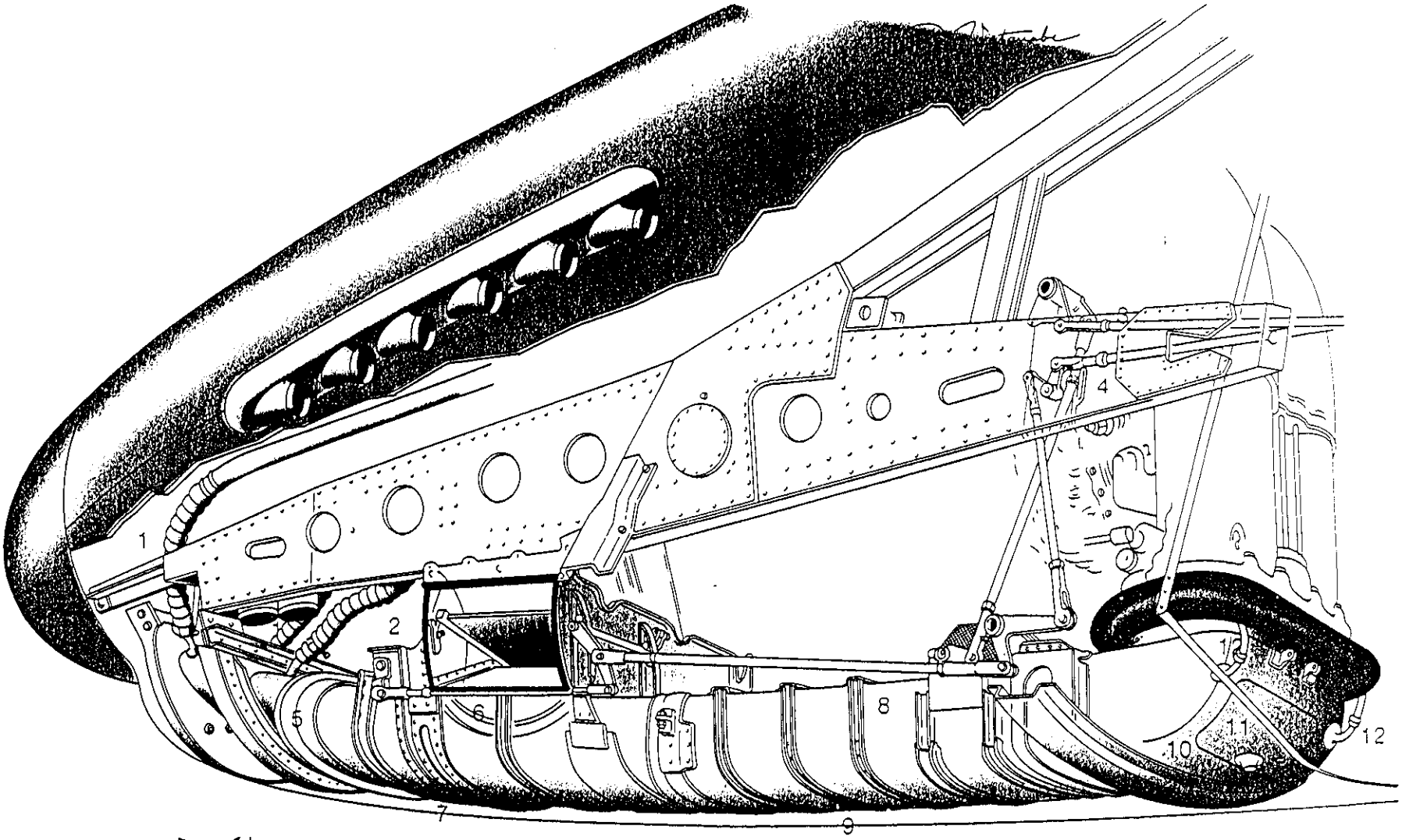


Rolls-Royce Merlin 61 engine

12-cylinder liquid-cooled 60°V engine fitted with two-stage, two-speed supercharger. The Packard-built Merlin 60 series were the V-1650-3 (Merlin 61) used on the P-51B, C, XP-51F and Australian CA Mk 20, the V-1650-7 (similar to Merlin 68) used on the P-51B-10/B-15, C-5/C-10, P-51D (all blocks), and Australian CA Mk 21, and the V-1650-9 (R.M.16 S.M.) used on the P-51H (all blocks) and XP-51M. (The V-1650-9 was developed from the Merlin 100 series and could be fitted with or without water injection).

	V-1650-3	V-1650-9
Total swept capacity:	1647 in³ (27 ltr)	1647 in³ (27 ltr)
Compression ratio:	6:1	
Dry weight:	1690 lb. (766.6kg)	1745 lb. (791.5kg)
Length:	87.108 in (2212mm)	87.141 in (2213mm)
Width:	29.97 in (761mm)	30.76 in (781mm)
Height:	41.63 in (1057mm)	44.97 in (1142mm)

Performance:	V-1650-3	V-1650-7	V-1650-9
Take-off power:	1380 hp (max 5 mins)	1490 hp (max 5 mins)	1830 hp (wet)
Low blower:	1600 hp at 11,800 ft (3600m)	1720 hp at 6200 ft (1890m)	–
Low blower:	1490 hp at 13,750 ft (4190m)	1590 hp at 8500 ft (2590m)	1930 hp at 10,100 ft (3080m) (wet)
High blower:	1330 hp at 23,000 ft (7010m)	1370 hp at 21,400 ft (6520m)	–
High blower:	1210 hp at 25,800 ft (7860m)	1065 hp at 23,400 ft (7130m)	1630 hp at 23,500 ft (7160m)

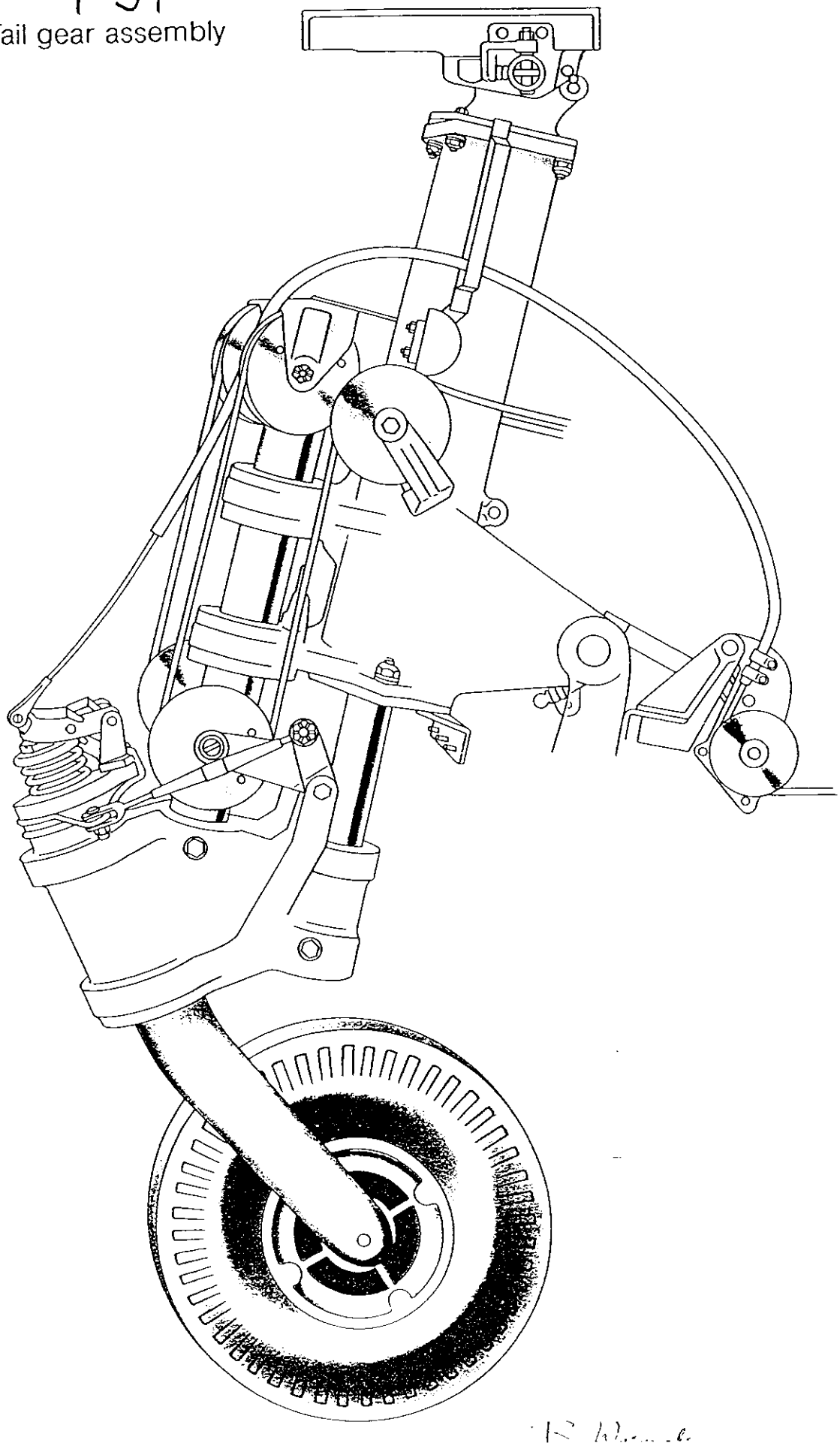


P-51
CARBURETOR
AIR SCOOP

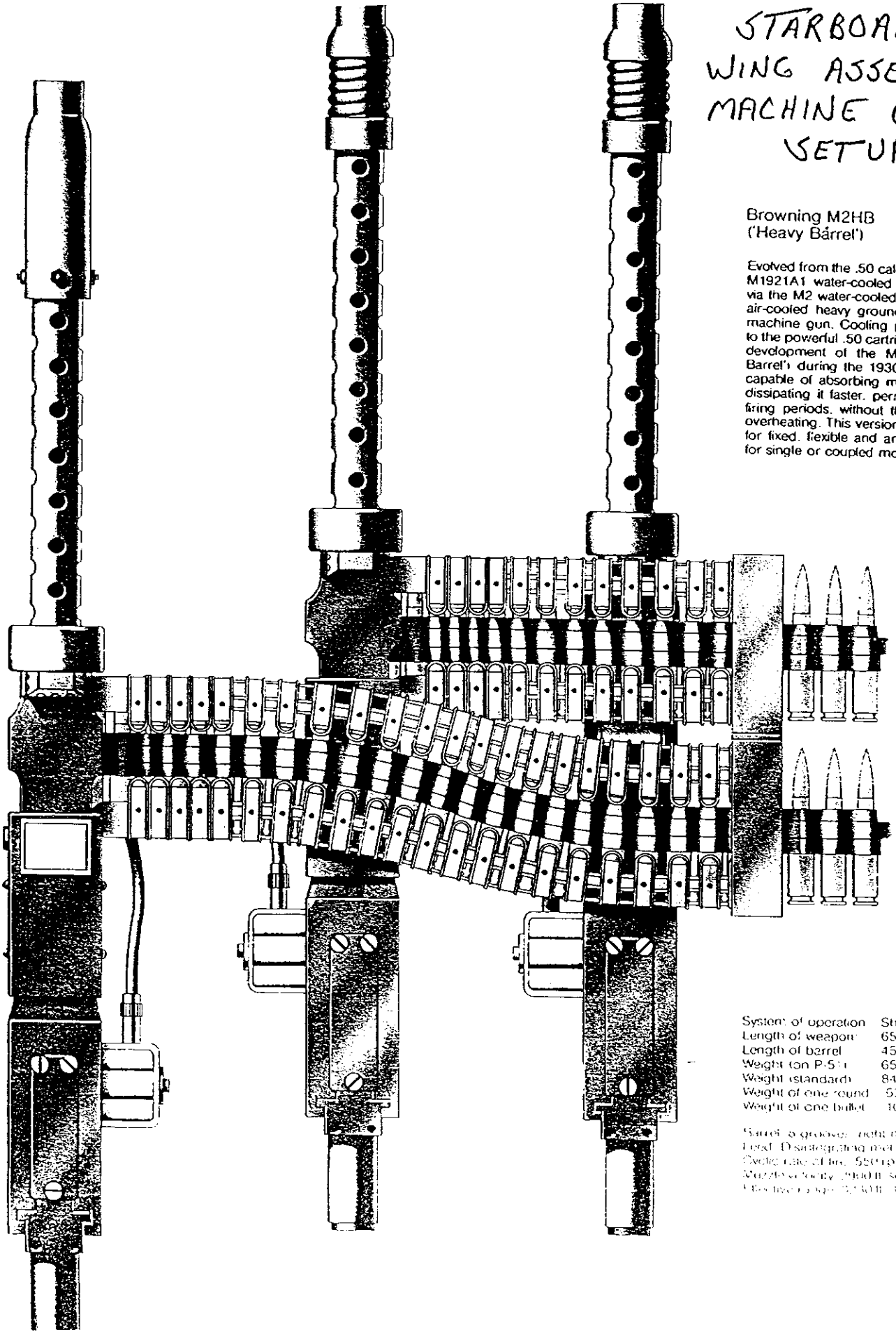
1 Spark plug blast tubes
2 Generator blast tube
3 Hot air control
4 Cold air control
5 Duct front (scoop) section
6 Ram air gate
7 Duct intermediate section
8 Icing screen
9 Duct rear section
10 Duct elbow
11 Access door
12 Drains

P-51

Tail gear assembly



P-51D STARBOARD WING ASSEMBL MACHINE GUN SETUP



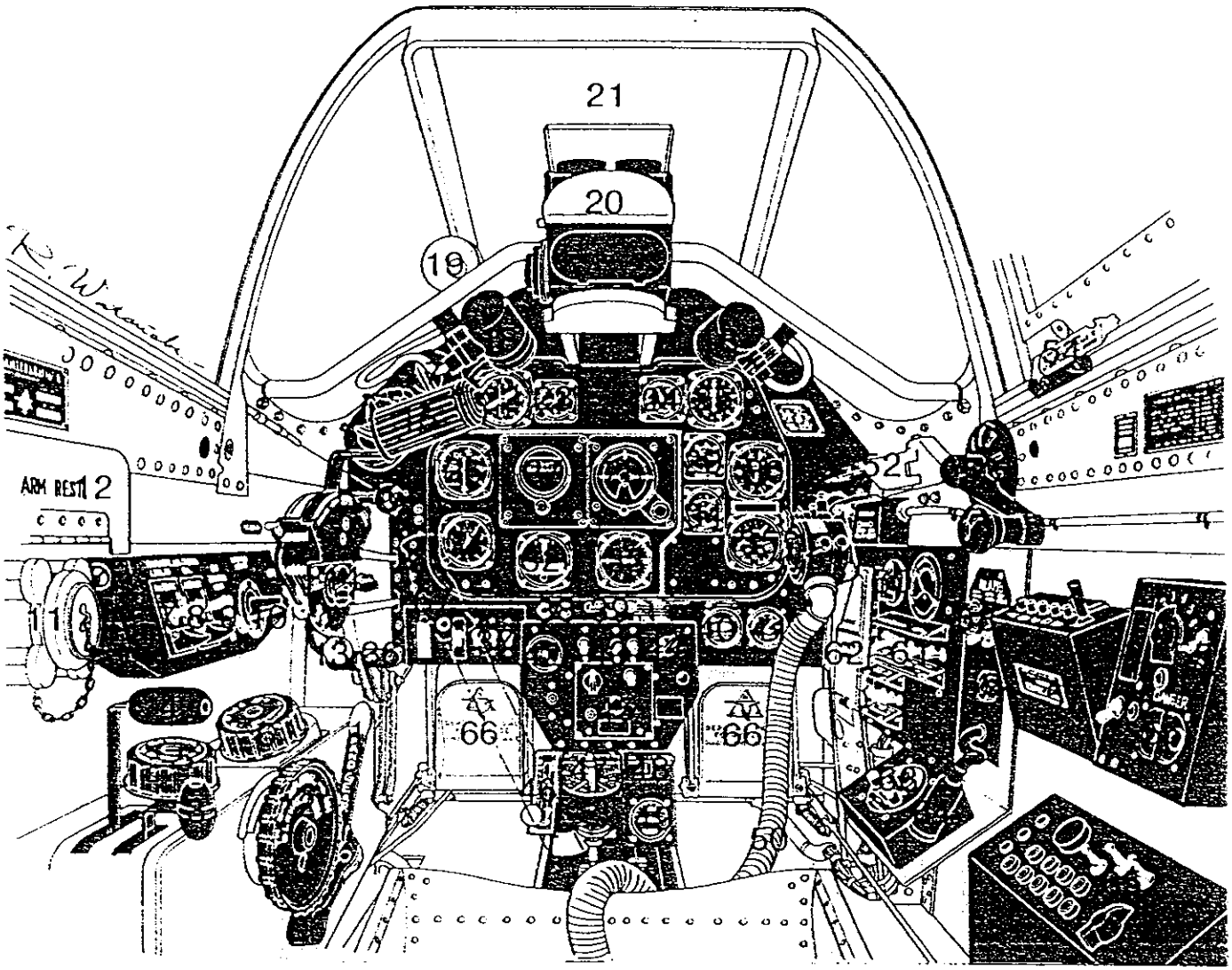
Browning M2HB ('Heavy Barrel')

Evolved from the .50 calibre Brow M1921A1 water-cooled machine via the M2 water-cooled and later air-cooled heavy ground and air machine gun. Cooling problems to the powerful .50 cartridge led to development of the M2HB ('He Barrel') during the 1930s which capable of absorbing more heat dissipating it faster, permitting lor firing periods, without the dange overheating. This version was evo for fixed, flexible and anti-aircraft for single or coupled mounts.

System of operation	Short recoil
Length of weapon	65 in (1651m
Length of barrel	45 in (1143n
Weight (on P-51)	65 lb (29.5kg
Weight (standard)	84 lb (38.1kg
Weight of one round	537 lb (993
Weight of one bullet	166 4 lb (50

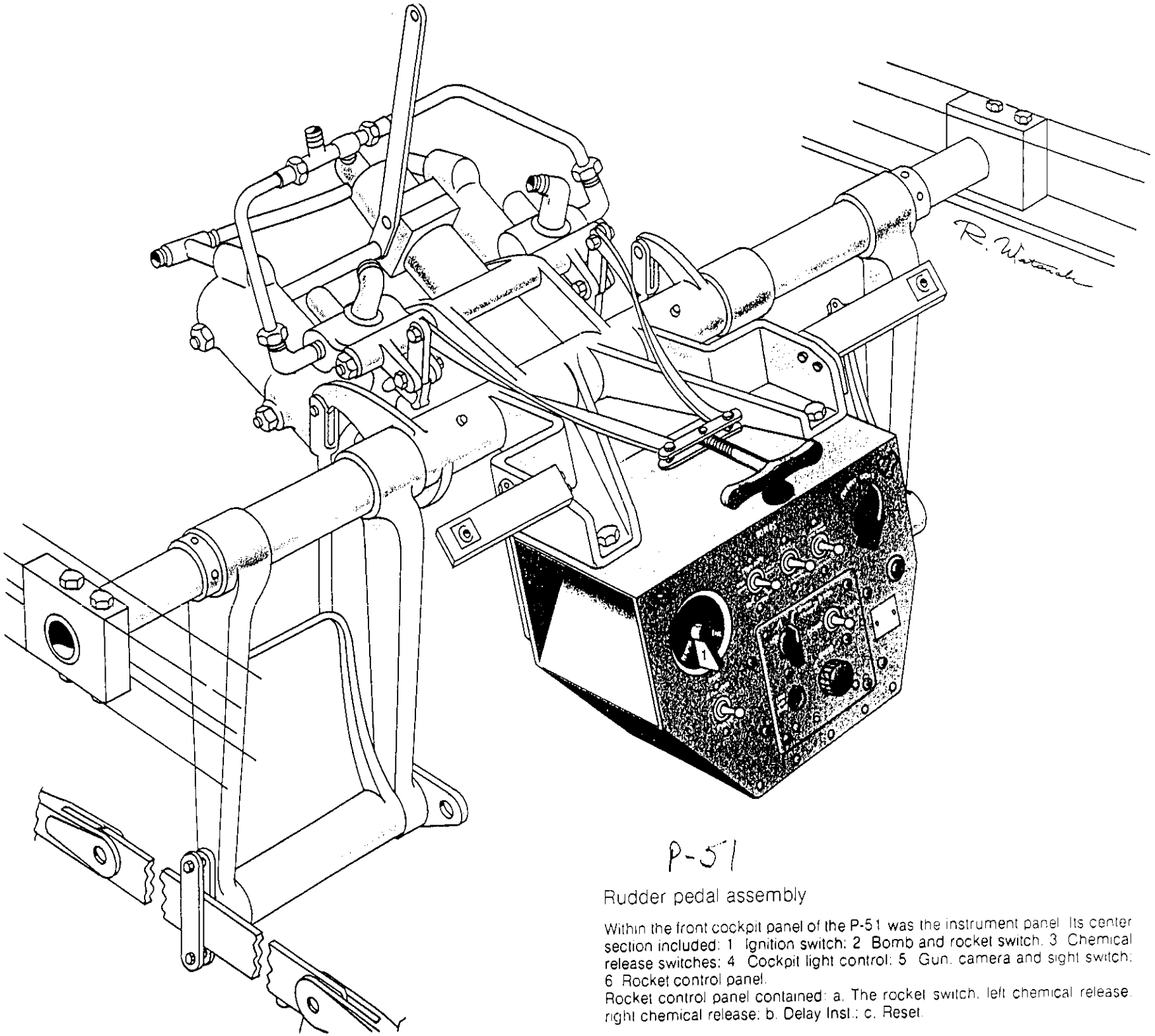
Barrel: 8 grooves, right hand twist
Feed: Disintegrating metallic link be
Cyclic rate of fire: 550 rpm
Muzzle velocity: 2930 ft. sec (893 m
Effective range: 2,500 ft (1000 m

P-51D COCKPIT



P-51D Cockpit

1 Landing gear control lever
2 Elevator trim tab control wheel
3 Carburettor hot air control lever
4 Carburettor cold air control lever
5 Rudder trim tab control
6 Aileron trim tab control
7 Radiator air control (coolant)
8 Radiator air control (oil)
9 Landing light switch
10 Fluorescent light switch, left
11 Flare pistol mount cover cap
12 Arm rest
13 Mixture control lever
14 Throttle quadrant locks
15 Throttle lever
16 Propeller control lever
17 Selector dimmer assembly
18 Instrument light
19 Rear warning radar lamp
20 K-14A gun sight
21 Laminated glass
22 Remote compass indicator
23 Clock
24 Suction gauge
25 Manifold pressure gauge
26 Airspeed indicator
27 Directional gyro turn indicator
28 Artificial horizon
29 Coolant temperature
30 Tachometer (Rpm counter)
31 Altimeter
32 Turn and bank indicator
33 Rate of climb indicator
34 Carburettor air temperature
35 Engine T gauge
36 Bomb salvo release lever(s)
37 Engine control panel
38 Landing gear warning light(s)
39 Parking brake handle
40 Oxygen flow blinker
41 Oxygen pressure gauge
42 Ignition switch
43 Bomb and rocket switch
44 Cockpit light control
45 Rocket control panel
46 Fuel shut-off valve
47 Fuel selector valve
48 Emergency hydraulic release handle
49 Hydraulic pressure gauge
50 Oxygen hose
51 Oxygen regulator
52 Emergency canopy release handle
53 Canopy crank and lock handle
54 Emergency release indicator
55 IFF control panel
56 IFF detonator button(s)
57 VHF radio control box
58 Rear warning radar control panel
59 VHF volume control knob
60 Fluorescent light switch, right
61 Electrical control panel
62 Circuit breakers
63 ESC 438 control box
64 Cockpit light
65 Circuit-breakers
66 Rudder pedal
67 Control column



P-51

Rudder pedal assembly

Within the front cockpit panel of the P-51 was the instrument panel. Its center section included: 1 Ignition switch; 2 Bomb and rocket switch. 3 Chemical release switches; 4 Cockpit light control; 5 Gun, camera and sight switch; 6 Rocket control panel.
Rocket control panel contained: a. The rocket switch, left chemical release, right chemical release; b. Delay Insl.; c. Reset.

United States Department of the Interior

NATIONAL PARK SERVICE
1849 C Street, N.W.
Washington, D.C. 20240

IN REPLY REFER TO:

The Director of the National Park Service is pleased to announce actions on the following properties for the National Register of Historic Places. For further information contact Edson Beall via voice (202) 343-1572, fax (202) 343-1836, regular or E-mail: Edson_Beall@nps.gov

Visit our web site at http://www.cr.nps.gov/nr

WEEKLY LIST OF ACTIONS TAKEN ON PROPERTIES: 6/01/99 THROUGH 6/04/99

KEY: State, County, Property Name, Address/Boundary, City, Vicinity, Reference Number, NHL, Action, Date, Multiple Name

COLORADO, DENVER COUNTY, Kopper's Hotel and Saloon, 1215-1219 20th St., Denver, 98001378, LISTED, 6/04/99
FLORIDA, MARION COUNTY, Ocala Historic Commercial District, Roughly bounded by 1st St. NW, 1st Ave. SE, 2nd St. SW, and 1st Ave. SW, Ocala, 99000656, LISTED, 6/03/99
GEORGIA, FANNIN COUNTY, Baugh, James W., Homeplace, Jct. of W. First St. and Messer St., Blue Ridge, 99000658, LISTED, 6/03/99
GEORGIA, MUSCOGEE COUNTY, Forston House, 1100 Forston Rd., Forston, 99000657, LISTED, 6/03/99
ILLINOIS, SANGAMON COUNTY, US ARMY Aircraft P-51D-25NA 44-73287, Capital Airport , 0.5 N of Jct. of IL 29 and Veterans Parkway, Springfield, 99000254, LISTED, 3/11/99
INDIANA, KNOX COUNTY, Ebner-Free House, 120 Locust, Vincennes, 85000601, REMOVED, 6/02/99
INDIANA, VERMILLION COUNTY, Brouilletts Creek Covered Bridge, Co. Rds. 100W and 1700S over Brouilletts Cr., Clinton vicinity, 94000586, REMOVED, 6/02/99
MASSACHUSETTS, MIDDLESEX COUNTY, Hosmer Homestead, 138 Baker Ave., Concord, 99000659, LISTED, 6/03/99
MASSACHUSETTS, WORCESTER COUNTY, Gardner Uptown Historic District, Roughly along Central, Cross, Elm, Green. Glazier, Pearl and Woodland Sts., Gardner, 99000660, LISTED, 6/03/99
MISSOURI, FRANKLIN COUNTY, New Haven Residential Historic District, Roughly along Wall St. and Maupin Ave., and bounded by Washington and Bates Sts., New Haven, 99000661, LISTED, 6/03/99
MISSOURI, LEWIS COUNTY, Gray, William, House, 407 Washington, La Grange, 99000666, LISTED, 6/03/99 (La Grange, Missouri MPS)
MISSOURI, LEWIS COUNTY, Hay, Dr. J.A., House, 406 W. Monroe St., La Grange, 99000664, LISTED, 6/03/99 (La Grange, Missouri MPS)
MISSOURI, LEWIS COUNTY, McKoon, John, House, 500 W. Monroe St., La Grange, 99000665, LISTED, 6/03/99 (La Grange, Missouri MPS)
MISSOURI, LEWIS COUNTY, Rhoda, Fred, House, 200 S. Second St., La Grange, 99000662, LISTED, 6/03/99 (La Grange, Missouri MPS)
MISSOURI, LEWIS COUNTY, Waltman, A.C., House, 302 Lewis St., La Grange, 99000663, LISTED, 6/03/99 (La Grange, Missouri MPS)
NEW HAMPSHIRE, ROCKINGHAM COUNTY, Little Boar's Head Historic District, Parts of Atlantic Ave., Chapel Rd., Ocean Blvd., Sea Rd., and Willow Ave., North Hampton, 99000668, LISTED, 6/03/99
NEW YORK, SENECA COUNTY, Queen's Castle, NY 414, Lodi, 99000564, LISTED, 6/01/99
NEW YORK, TOMPKINS COUNTY, First Presbyterian Church of Ulysses, Main St., Trumansburg, 99000669, LISTED, 6/03/99
NORTH CAROLINA, MECKLENBURG COUNTY, McNinch, Frank Ramsay, House, 2727 Sharon Ln., Charlotte, 99000670, LISTED, 6/03/99
OHIO, CUYAHOGA COUNTY, Greyhound Bus Station, 1465 Chester Ave., Cleveland, 91000302, LISTED, 6/02/99
OKLAHOMA, CRAIG COUNTY, First Methodist-Episcopal Church, South, 314 W. Candian Ave., Vinita, 99000673, LISTED, 6/03/99
OKLAHOMA, LINCOLN COUNTY, National Guard Statistical Building, Park Rd., 1 blk W of 6th St., Chandler, 99000672, LISTED, 6/03/99
OKLAHOMA, OKLAHOMA COUNTY, Smith and Kernke Funeral Directors, 1401 NW 23rd St., Oklahoma City, 99000671, LISTED, 6/03/99
PENNSYLVANIA, PHILADELPHIA COUNTY, SS UNITED STATES (Steamship), Pier 82, Philadelphia, 99000609, LISTED, 6/03/99
SOUTH DAKOTA, CUSTER COUNTY, Archeological site no. 39CU1619, Address Restricted, Custer vicinity, 99000679, LISTED, 6/03/99
SOUTH DAKOTA, GREGORY COUNTY, Tackett Underwood Building, Address Restricted, Gregory vicinity, 99000678, LISTED, 6/03/99
SOUTH DAKOTA, JERAULD COUNTY, Wessington Springs Carnegie Library, 124 N. Main Ave., Wessington Springs, 99000677, LISTED, 6/03/99 (Historic Bridges in South Dakota MPS)
SOUTH DAKOTA, MINNEHAHA COUNTY, Palisades Bridge, 25495 485th Ave., Garretson vicinity, 99000687, LISTED, 6/03/99 (Historic Bridges in South Dakota MPS)
SOUTH DAKOTA, WALWORTH COUNTY, Walworth County Courthouse, 4304 4th Ave., Selby, 99000680, LISTED, 6/03/99 (County Courthouses of South Dakota MPS)
TEXAS, TRAVIS COUNTY, Smith, B. J., House, 700 W. 6th St., Austin, 78002992, REMOVED, 5/27/99
TEXAS, WALLER COUNTY, Anderson, L.C., Hall, L.W. Minor St., building #0541, Prairie View, 99000611, LISTED, 6/03/99 (Praire View A&M University MPS)
TEXAS, WALLER COUNTY, Banks, W.R., Library, L.W. Minor St., building #0508, Prairie View, 99000612, LISTED, 6/03/99 (Praire View A&M University MPS)
TEXAS, WALLER COUNTY, Evans, Annie Laurie, Hall, L.W. Minor St., building #0544, Prairie View, 99000613, LISTED, 6/03/99 (Praire View A&M University MPS)
TEXAS, WALLER COUNTY, Hilliard Hall, A.G. Cleaver St., building #0537, Prairie View, 99000614, LISTED, 6/03/99 (Praire View A&M University MPS)