

Auxiliary-powered Sailplane NEWS

*The Official Publication of the Auxiliary-powered Sailplane Association, Inc.
Dean Carswell-President*

ASA is a Division of the Soaring Society of America

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March-April 2002



A Rolladen-Schneider IS9 Motor glider in soaring flight over Germany. This issue covers the development, performance and specifications of the IS9. *Image courtesy Aerokurier Magazine*

Rolladen-Schneider's IS9 Self-Launcher

Editor's Note: This story was provided to ASA by Werner Scholz, a R/S employee assigned to Design and Certification. The text has been edited slightly for English clarification. USA LS9 Dealers are Mike Adams 970-226-8550 (CO) and Ed Hollestelle 519-461-1464 (Canada)

At the beginning we had the idea to combine the well proven LS6 with the (then) new 18m wing with an already existing power plant. This led Rolladen-Schneider to Walter Binder who offered his "system Binder" which already had shown its strong points in the "Binder Discus" and other motor gliders. To get enough space in the fuselage behind the wing and also in the cockpit (additional control elements plus more comfort) it was decided not to use the original LS6 fuselage. Instead the LS4 fuselage was used and enlarged between wing and middle of the tail boom. Structurally the fuselage is all new combining a new safety cockpit (from GFRP plus CFRP) with a CFRP fuselage behind the wing.

The wing is from the same mold as the LS6-18w and the structure is similar, i.e. spar and shell have been reinforced due to the higher loads of the heavier motor glider. The tail is identical in shape to the LS4 but here also new materials (carbon and kevlar) have been introduced.

The main wheel was changed to a five inch wheel and moved forward to avoid nosing over when applying full power. The wing tips have small wheels for taxiing and take-off without a wing runner. The tail wheel has the unusual design of being located directly in the rudder. This results in perfect response to steering inputs: full pedal to the right means always that you turn around the right wing tip – no matter if you are rolling in grass or on concrete. We also felt that the tail wheel must not be too hard so the 210x65 mm wheel was used. Another strong point is now that you can move the LS9 quite easy on the airfield (when you decide against taxiing which is now easier): for pulling/pushing forward no tail dolly is needed and when you push back you need one person to hold the rudder in the direction wanted. (Only pulling backwards by car still needs a dolly tail fork combination.)

Continued on Page 2.....

LS9 continued from page 1.....

After Rotax left the market of two-stroke engines for self-launcher we decided to use the Solo 2625 two-cylinder two-stroke engine. This has been combined with a propeller mast made by Binder, a folding exhaust system and a Technoflug two-blade propeller. The system in the engine compartment is nearly 100% identical with the Ventus 2 CM as Rolladen-Schneider has decided together with Walter Binder and Schempp-Hirth that working together in this field does not only save money but also improves the service for our customers. With about 50 hp (resulting in approximately 110 kg static thrust) we feel that there is really sufficient power installed in the LS9 – less than 200 metres (656ft) are needed to take off at standard atmospheric conditions with 450 kg (992lb) weight (and only a little over 300 metres to get over 15 m altitude) and when you have 30°C at 1500m MSL and weight 525 kg (1157lb) the numbers are 350m (1148ft) for lift off and 510m (1673ft) to reach 15 (50ft) m AGL. The climb rate is 3,5 to 4 m/s (689-787fpm) for sea level (at 450 / 525 kg) and 2,0 to 2,3 m/s (394-453fpm) at 3000 m (9842ft) MSL.

The fuselage holds a tank with a capacity of 22,5 litres (5.94gal) which is sufficient for at least 60 minutes of endurance (depending on the engine and atmospheric conditions you get between 60 and 75 minutes). Maximum range is attained by climbing at maximum climb rate and gliding with best L/D after shutting down. With a realistic flight mass of 480 kg and when climbing from sea level to 3000 m MSL you get a mean climb rate of 2,9 m/s at speed of 95 km/h. That translates to an altitude gain of more than 10 km and 100 km distance flown in one hour. Gliding with max. L/D of 47 is another 470 km. Depending on the wind it is possible to fly farther than 550 km with one full tank. The fuel used is the standard automobile lead free super plus two-stroke oil mixture – avgas 100 LL can be also used instead of lead free super. The engine is deployed by use of an electric screw jack system, it has an electric starter and electric fuel and coolant pumps. Standard equipment is a big (12 volt 24 ampere hours) battery for engine operation plus an independent small (12 volt 7 ampere hours) battery for the sailplane avionics. It is possible to use the big battery also for radio and variometers, but starting /deploying / retracting the engine does not affect your vario or logger anymore. Charging comes through the generator and a plug for re-charging on the ground. Additional solar cells are possible as are additional batteries.

The performance as a sailplane of the LS9 is the same as for the LS6-18w. Maximum L/D has been measured to be better than 47 and minimum sink speed is about 58 cm/s at 480 kg. Perhaps even more important is a speed of 180 km/h (112mph) at L/D of 30! The LS9 still retains the good flying qualities of the LS6 and when flying together with 15 m gliders there is no disadvantage while thermaling due to the high aspect ratio of over 28 (11.4 m sq. wing area). Flaperons and big upper side air brakes add to the easy handling qualities. We are in the process of completing the German type certificate of the LS9 from which we have now built 10 ships. We will accept confirmed orders only after full certification in Germany which should be completed during 2002. Submitted by Werner "micro" Scholz Rolladen-Schneider, design & certification <micro-@rolladenschneider.de>



Werner joined the Rolladen-Schneider team in 1997. His first glider solo was in 1980. He now has over 2300 flight hours in 80 different gliders. In 1990 he flew 791 km to win the club class cup at Barron Hilton 1990/91. He is a member of Akaflieg Stuttgart and prior to joining R/S was a staff member at the Institute for Aircraft Design, University of Stuttgart. In the image above Werner sits in the LS8 , a new self-sustainer under development by Rolladen-Schneider.

President's Message

In the last issue, I wrote about the problems of not maintaining currency over the winter. By the time you read this, spring will be with us. Have you planned ahead and decided what proper steps and precautions you should take as part of getting back in the air?

These should include a very careful check of your ship, and its power unit and accessories in particular. You should also review handling of your sailplane and its systems, and appropriate action to take in an emergency. And yes – that process should include review of the flight manual and other relevant information. In my experience, that often leads to “how could I have forgotten that?” Lastly, review the local operating procedures at your field, and in the area you plan to fly – have they changed since you last flew? There has been a lot going on in the post-9/11 aviation environment affecting our freedom to do what we used to take for granted.

That deals with your equipment and operating environment. What about you? Are you ready to go? If there is any doubt, seek assistance – take a dual flight with a CFIG even if the ideal, a two-place motorglider, is not available. In the larger scheme of things, the cost is not material. Remember that you do this for fun – if you let things go pearshaped, it very quickly stops being so. Let's actively plan ahead and keep it fun!

Safe soaring!

Dean Carswell

IS9 Tutorials



Left: Canopy open detail showing flight instrument pod and engine control console just forward of the stick. Right: Instrumentation.



Aerokurier Photo

Aerokurier Photo



Left: Tailwheel steering detail.

Right: Solo 2625 engine installation.



Aerokurier Photo

Rolladen-Schneider Photo



Rolladen-Schneider Photo

News and Views



Burt Rutan fires up a rocket-powered testbed Long EZ. The two rocket engines have a firing duration of 2 minutes which can propel the aircraft to 10,000ft and still be climbing. Each rocket motor weighs just 3lbs, produces 400lbs of thrust and is the size of a larger beer can (2.5" dia). XCOR, the rocket development company hopes to produce a reusable rocket engine that will propel aircraft to low Earth ballistic orbit. Vertical drag races are also envisioned. *Air & Space Oct/Nov 2001*



The Cavok-10 15 metre single-place ultralight motorglider completed its maiden flight on December 13,2001 at Challes-Eaux Airport, France. Designer/test pilot Christian Brondel was very satisfied with the available power, the smoothness of the controls and the general handling characteristics. This glass-fibre high performance aircraft has a projected L/D of 40:1 and was developed by the English/Swiss company, Hatherleigh Consultants Ltd, and designed to JAR 22 standards. The estimated price is 40,000 EURO. This new concept can be flown with two different wing spans: 15 or 11 meters. Max flying weight is a mere 595lbs with a wing loading of 6.1 lb/sq.ft. No water ballast. No wing spoilers. Fuselage mounted speed brake. Flapperons Fixed gear. For more details see their website: <www.fly-cavok.com> Pho: 011-41 21-702-2851; Fax: 011-41 21-702-2861; Email: info@fly-cavok.com



A SHORT HISTORY OF ASA

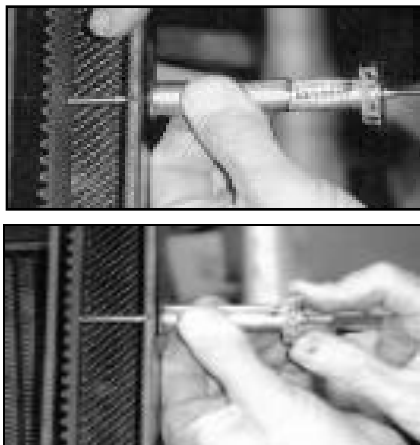
Pete Williams founded SLSPA (Self-Launching Sailplane Pilot's Assn.) in 1988 with 12 charter members, which is now known as ASA. It was first an Affiliate of SSA and later it became a Division. In the beginning Pete and his wife Charm ran the whole show including incorporation as a non profit corporation, layout, writing, printing, mailing, finances and membership list until Pete stepped down as the president in 1995 and Stan Nelson became the new president. Pete remained the newsletter editor and the Publications Officer. Pete's book Self-Launch, Retractable Engine Sailplanes has also attracted many new ASA members. Over the years ASA has cultivated and developed solid contacts with all of the German factories.

As of September 2001, ASA had 409 members, 52 of which are overseas (32 individuals and 20 overseas companies and organizations). 210 ASA members (including 22 foreign) own a motorized sailplane. Each year between 40-60 new members join ASA and about 30-50 members fail to renew. The net gain for the past 13 years is 25-27 new members per year. In the fall of each year an ad is placed in Soaring Magazine seeking new members. The ASA web site has also attracted new members. The SSA office in Hobbs NM refers all inquiries concerning motorgliders to ASA. Brian Utley is the ASA Membership Chairman and has faithfully handled all the incoming funds for membership, produced the mailing labels and the Roster for over 7 years. His services have been absolutely indispensable as have Eric Greenwell's contribution as Treasurer. ASA is financially sound.

ASA's third president Dean Carswell oversees all ASA Board business and conducts the annual membership meeting including chairing the ASA Breakfast at the SSA Annual Convention which has historically attracted new members. In a nutshell this is the current condition of ASA. It is the only organization in the soaring world dedicated to supporting pilots who fly engined ships. More information is available from the ASA web site created by Eric Greenwell: <www.motorglider.org>. Please feel free to provide us with your comments and suggestions. Contact any Director, President Dean Carswell, Brian Utley or Pete Williams direct. This organization exists to serve its members. Let us hear from you.

More on Drive Belt Tensioning & Tracking for DG-800B/808B & 505MB

In addition to proper belt tension which is 11mm (5/16"), visually check the pulley flanges to make sure one side of the belt is lightly contacting one of pulley flanges. Worst case is for the belt sides to be contacting pulley flanges on opposite sides. This can force the belt into undesirable parallel misalignment. Also anytime belt tension is increased, the distance from the pins on the top pulley to the rpm sensor will increase and the sensor should be readjusted to .072". Chuck Rausch has developed a tension measuring tool that measures accurately belt tension. The first image shows the tool in the unloaded condition. The next image is in the loaded condition. Chuck states he will not mass produce this device but will provide complete data to individuals who are interested in building one. Chuck can be contacted at <flysails@yahoo.com>



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Cell: 316-409-9624 davemcconeghey@hotmail.com
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FOR SALE....DG-800B

1996, 500hrs TTAF, 50hrs TTE. Fully Instrumented
with GPS and O2 system. 50hp MidWest Engine. 15
& 18 Meter Wing Tips. Engine and gel coat in excel-
lent condition. Cobra Trailer. \$105,000. Ed Shilen
903-887-9720 (TX)

Ventus Bt FOR SALE.....

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improve your organization.

FOR SALE

DG-400

1986, S/N 189 TTA-900HRS

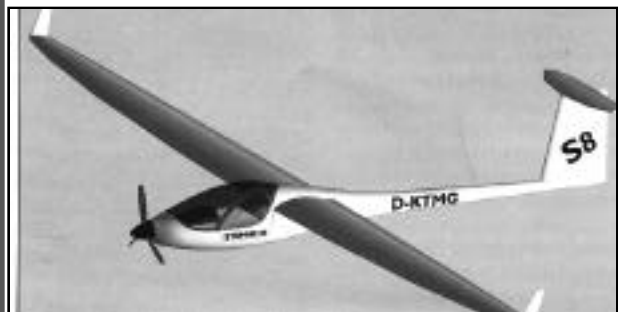
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The May-June 02 Issue will contain information on
Stemme's new line of motorgliders.

GATES DRIVE BELT TENSION INFORMATION

Editor's Note: The following text is quoted verbatim from the Gates web site <www.Gates.com>. Gates Poly Chain GT2 drive belts are used for power transmission in most Solo 2-stroke engine powered sailplane applications.

"14. Self-Generated Tension

All synchronous belt drives exhibit a self-generating or self-tightening characteristic when transmitting a load. Laboratory testing has shown this characteristic is similar with all tooth profiles. The designer/user should be aware that self-tensioning can result in increased bearing and shaft loads and reduced drive performance; i.e., short belt life. This can be avoided by following proper tensioning procedures.

Properly designed and tensioned drives will not be significantly affected by self-generated tension. While belt overtensioning can impose higher bearing and shaft loads and lead to reduced belt life, undertensioning can result in self-tensioning.

When a belt is too loose for the design load, the self-tensioning characteristic results in the belt teeth climbing out of the sprocket grooves, leading to increased stresses on the belt teeth, accelerated tooth wear and reduced belt life.

When a belt is severely undertensioned, the self-tensioning characteristic can result in the belt ratcheting (jumping teeth). When this occurs, significant shaft separation forces are instantaneously developed in the drive, resulting in damage to bearings, shafts, and other drive components including the belt. NOTE: This is true for all synchronous belts. Maximum drive performance and belt life are achieved when the belt is properly tensioned for the design load and maintained."



Apis 15-meter Self-Launcher

Roger Mudd of Apis Sailplanes, Inc. is the USA Dealer for Albastar Sailplane's new 15-meter Self-launching sailplane. Tel: 740-387-1940 (OH) EMail <ApisGliders@aol.com>. May-June 02 ASA Newsletter will feature this sailplane.

AMS-FLIGHT....

20 YEARS OF TRADITION AND HIGH QUALITY-OVER 956 SAILPLANES BUILT

Editor's Note: In the USA there has not been a lot published about ELAN FLIGHT's (now known as AMS-FLIGHT) contribution to sailplane manufacturing. This factory news release sheds some light on the extensive experience and expertise of AMS as a reputable manufacturer of sailplanes using composite structures. DG-USA is the USA Dealer for DG/ELAN/AMS sailplanes and for AMS-built Carat Sailplanes.

In 1998, Elan marked 20 years since the first single-seat sailplane DG-100 ELAN was built by a selected team of Elan employees in Bruchsal, Germany. On 2 February 1979, the first DG-100 ELAN built at Elan, Begunje (Slovenia) flew for the first time ever. The company AMS - FLIGHT, d.o.o. was established in 1999 to continue the existing airplane production by taking over, as at 1 September of that year, the entire ELAN FLIGHT Division of Elan. The two private company owners, Mr Ales Cebavs and Mr Matjaz Slana are both directly involved in the company's business as managers specializing in sales and mechanical engineering. The company's manufacturing facilities are located at Begunje (the Elan plant), in the northwest part of Slovenia, close to the borders with Austria and Italy. Production in accordance with JAR. Airplane Production Approval Certificate No. URSZP - P-01. Type Certificate holder for DG-ELAN-AMS sailplanes in Slovenia. As of December 2001, Elan and AMS have produced the following number of sailplanes and composite structures:

• DG-100 ELAN	58
• DG-101 ELAN	164
• DG-300 ELAN	444
• DG-303 ELAN	56
• DG-500 ELAN	139
• DG-505 ELAN	92
• DG-1000S AMS	3
• Composite aircraft set: wings, horizontal tail, rudder over 132 sets.	

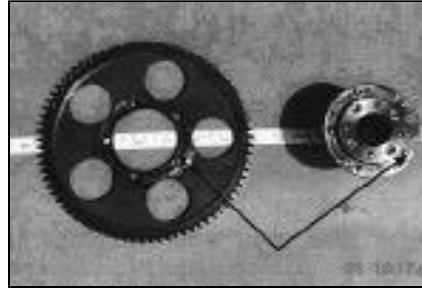
At present, AMS builds high performance sailplanes, high quality composite components for sailplane spare parts and newly produced components for UL and certified motor aircraft. These kind of products require extremely precise manual work in which attention has to be paid to every bubble, every drop of excess resin, every millimeter of over 100 laminated components per sailplane.

- DG-ELAN-AMS sailplane models produced:
 - DG-303 ELAN
 - DG-303 ELAN Acro
 - DG-303 Club ELAN
 - DG-303 Club ELAN Acro (standard class sailplane; +/-5 g)
 - DG-505 ELAN Orion
 - DG-505 ELAN Trainer
 - DG-505/20 ELAN Winglets (model with flaps)
 - DG-505/22 ELAN (model with flaps)
 - DG-505 MB/20 m Winglets (model with retract. engine and flaps)
 - DG-505 MB/22 m (model with retract. engine and flaps)
 - DG-1000S AMS The Challenger!
 - DG-1000 Club AMS
 - DG-1000S - 18/20 AMS
 - Carat - Technoflug Germany design

AMS production is organized in accordance with JAA standards, based on POE and QAM, as well as controlled by the Civil Aviation Authority (CAA) of Slovenia and by the sailplane and aircraft companies as customers also through their CAA's such as LBA and RAI-ENAC. For all sailplanes, the customers are provided with all the required documents including Export Certificate of Airworthiness, Non-registration Certificate, log book, manual, Certificates of Airworthiness for the equipment installed, guaranty card, customs certificates, etc. DG-ELAN-AMS sailplanes are distributed to the final clients, such as clubs and individual pilots, directly by AMS and through DG Flugzeugbau GmbH, Germany. Carat is distributed directly by AMS and through authorized agents. AMS 2002 sales projection is 5.5 million DM. AMS has 54 employees. For more information contact: matjaz.slana@ams-flight.si or ams@ams-flight.si

Starter Ring Gear Attachment Failure

The images above were taken by Jim Leedy after his DG-505MB had the 5 bolts that secure the lower belt drive pulley to the starter ring gear work loose. The drive belt pulley is connected to the main drive shaft of the SOLO 2625 engine. One DG-800B pilot had these bolt heads shear off completely resulting in the starter ring gear being no longer attached to the lower pulley. In that particular case the ring gear free wheeled, wobbled and vibrated around the engine pulley resulting in scraping damage to the face of the carbon fiber mast.



The upper image shows the lower pulley (right) detached from the ring gear (left). The arrows point to one of the 5 attachment bolts on the pulley and its respective position on the ring gear. These views show the bottom side of the ring gear and pulley attachment assembly. The bolts are secured with Loctite during assembly.



The lower image shows a crack in one hole of the ring gear evidently caused by vibration as the bolt head was not seated firmly against the ring gear. Some pilots have staked both the bolt heads and butt ends.

Once the assembly is bolted together and secured to the engine's main drive shaft, there is no way to visually inspect the tightness of the bolt heads against the ring gear. All that can be seen during a preflight inspection is the butt ends of these 5 bolts. It is recommended to place some paint marks on the butt end of the bolts. On the preflight inspection assure that the ring gear is firmly attached and cannot be moved up or down and that the paint marks on the bolt butt ends are undisturbed. This method of assembly is found on DG-800Bs, DG-808Bs and DG-505MBs.

Submitted by Pete Williams

Why I Like Wing Fuel Tanks

Editor's Note: There have been extended discussions about the pros and cons of using wing tanks on the DG Solo Users Group Yahoo web site:

<<http://groups.yahoo.com/group/DGSoloUsersGroup>> This account by Thomas Milko gives one of the positive aspects of using wing tanks.

Though I started to fly my DG-800B one year ago, I flew a lot. The wing tank was used only a few times, on long distance trips, where fuel was not available. For instance, I made a 750km soaring flight, and landed in a very remote area in the west of Brazil, near the border with Bolivia. No fuel there, next day the day was almost unsoarable, and I needed to go back, to catch a jet flight back home and used the engine most of the time, to make it back, plus some miserable soaring.

Another experience where wing fuel tanks were decisive, a trip to the NE of Brazil, again flying in very remote areas, where no fuel was available, it was a 2,500km (1,553sm) trip to the North, landing in different airports, only one had fuel, I did not use it as I was able to soar 500km every day, but it was very comforting to know that I would make it even with no soaring conditions. On the way back, I was stuck in a small airstrip for 2-3 days, than I was able to takeoff using again a lot of motor, before reaching soaring conditions again.

For contest and flights within my area, no wing fuel tanks were ever used. So if you want to go into remote areas, it's a good option. I hope to go to Argentina in 2002, and again the wing tanks will be used. Sometimes fuel is only available in the larger airports, where you don't want the hassle to land, or you don't trust the quality of the precious liquid. Hope this helps!

Thomas Milko R. Oscar Caravelas 334 AP.72
05441-00 Sao Paulo Brasil
E: <tmlk@aol.com.br>

MINUTES OF THE MEETING OF THE BOARD OF DIRECTORS

OF THE AUXILIARY-POWERED SAILPLANE ASSOCIATION

The annual meeting of the Directors of the Auxiliary-powered Sailplane Association (ASA) was held in Ontario, CA on 8 Feb. 2002. Dean Carswell served as chairman of the meeting. The directors present waived the reading of the minutes of the previous meeting.

Upon motion duly made and seconded, the following officers were elected for 2002-3

President	Dean Carswell
VP, Contest	Rick Howell
VP, Newsletter	Pete Williams
VP, Treasurer	Eric Greenwell
VP, Membership	Brian Utley
VP, Safety	Stan Nelson
Assistant Safety	
Officer	Oliver Dyer-Bennet
Secretary	Lloyd Atwell

Eric Greenwell, Treasurer, reported a balance of \$8600.00, with an income of \$7800.00 and expenditures of \$6900.00. Mr. Greenwell discussed the website and information that is to be displayed on it. The Board discussed payment by credit card and multiple year membership sign-ups. As a result of this discussion a new dues structure, listed below, was accepted.

	<u>US</u>	<u>Non-US</u>
1 year	\$20	\$25
2 year	\$38	\$48
3 year	\$55	\$70

Pete Williams, discussed the current problems with the publication of the News Letter and its' mailing to the membership. Stan Nelson, Safety Chairman, and Oliver Dyer-Bennett, Asst. Safety Chairman, discussed safety. From the floor: Jim Herd discussed the expansion of motorized sailplanes and recommended that the ASA benefit from this world wide expansion. With no further business to come before the board the meeting was adjourned.

Lloyd Atwell, Secretary

ASA Mission

The Auxiliary-powered Sailplane Association, Inc. was founded in 1988 as a non-profit organization to encourage the design, development and safe use of motorgliders, self-launching and sustainer engine sailplanes.

ASA Membership

Membership in ASA is open to anyone interested in powered sailplanes. Write or call: Brian Utley, ASA Membership Chairman, 1930 S.W. 8th St., Boca Raton, FL 33486-5205 Tel: 561-750-6876 Fax: 561-393-7458 Annual Dues: \$20 USA, \$25 International

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Competition: Rick Howell.....972-245-0830

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Pete Williams, ASA Publications Manager, is the Editor, and Print Production Manager for the newsletter. As such, he supervises and coordinates with a printer located in Minden, Nevada. The Newsletter is mailed from Minden.

Contributors are requested to submit hardcopy type-written or keyboarded text .12pt font size is best for accurate scanning. If submitting text on a floppy disk, please advise the word processing program used. Text may be edited as required to fit the newsletter. The newsletter is produced on a Macintosh G-3 using AppleWorks word processing software. Photos are always welcome and will be returned promptly.

The newsletter is delivered to the printer the last week in Jan; Mar; May; July; Sept & Nov. ASA desires input on what the members want in this newsletter and we are doing all we can to keep it informative and interesting. *It's your newsletter, so please let us hear from you!*

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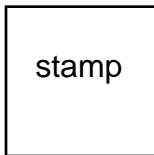
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March-April 2002

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