Auxiliary Powered Sailplane

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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President's Message
Are You Safe?

I make no apology for continuing to talk about safety, harping about it, if you will. I shall feel free to go on in this vein until we stop suffering losses, both human and sailplane, from pilot error (that means caused by us – you and me). Last issue, I wrote about Critical Assembly Checks. This time, I am going to talk about our being fit to fly. Do you use the "I'm Safe" checklist? Here is a summary.

Illness: Not just fever and sickness, but are you below par? Headache, sinus blockage, other minor but distracting ailment, hangover? All reduce your concentration.

Medication: We all know some drugs have side effects – drowsiness, blurred vision, allergic reaction, and so on. Why are you taking the drug in the first place, and are you safe to fly if you are?

Stress: We all have it from time to time. Are you really sure you can put all the stressing factors aside when you climb in your ship? If you can't honestly say yes, your concentration will be impaired – fly in this condition and you may discover real stress!

Alcohol: Any residual alcohol in the system has an adverse effect; and this is amplified at altitude because of the oxygen depletion – even if you are using supplemental oxygen.

Fatigue: Good night's sleep? How many hours have you already worked/ driven/ flown prior to your intended flight? Wandering attention is a flight hazard.

Familiarity: Are you really current? Read the flight manual recently? Ready for an emergency? Done a thorough CAC? Familiarity may not breed contempt, but it may divert your attention elsewhere.

Eating: Lack of food can reduce blood sugar causing loss of concentration; dehydration can incapacitate you. A favorite question of accident investigators is 'when did the pilot last eat?' This is a no-brainer!

Bottom line is if we cannot say "I'm Safe" before *every* flight, **we should not fly.**

Dean Carswell

A Schleicher ASH 25 M climbs out using a rotary wankel engine originally developed by Great Britain's Norton Motors and modified by Mid-West Aero Engines for use in a powered sailplane. See Page 2.

Bob Moore Becomes Soaring Hall of Fame Member

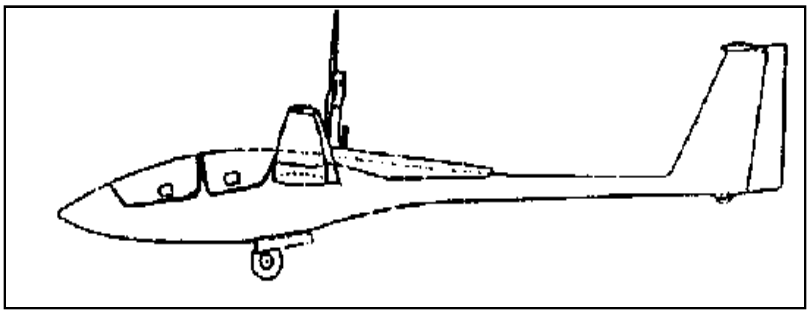
Robert Lee Moore of Richland, Washington, was inducted into the National Soaring Museum's Hall of Fame at the 2001 SSA Convention on Feb.9, 2001. An ASA member since 1988, Bob has been an avid supporter of the USA motorglider movement and is an active pilot flying his PIK-20E. His nomination culminates many years of faithful service to the SSA. In addition to many achievements, Bob was the first SSA Director for Region 8 when the SSA expanded in the mid 50's. During his eight years as a board member he held many positions, one of which was the first Chairman of the Membership Committee. In this post Bob initiated numerous ways to increase membership including the still used Chapter system. He is one of America's renowned soaring pioneers. Congratulations Bob!

Schleicher ASH 25 M 2-place Open Class High Performance Powered Sailplane

Spans:	25.00 m	25.60 m
	82.03 ft	84 ft
Wing area:	16.31 sqm	16.46 2sqm
	175.56 sqft	177.17sqft
Aspect ratio:	38.32	39.81
Fuselage length:	9.00 m	29.53 ft
Wing airfoil:	HQ17 and DU 84-132V3 at the wing tip.	
Empty mass approx.	470 kg	476 kg*
	l 550 kg	556 kg*
	1036 lb	10501b*
	11213 lb	1226 lb*
Max.Flight mass	750 kg	1654 lb
Max. Waterballast	120 1	31.7 US.Gal.
Max.wing load 2-seated	46 kg/m	45.6 kg/m
	9.4 lb/ft	9.34 lb/f t
Min.wing load	34 kg/m' 1	39 kg/ft
	6.96 lb/ft 2	8 lb/ft 2
Best L/D**	57 at 95 km/h (51 kts)	
Min. sink**	0.42 m/sat 85 krn/h	
	82.66 ft/min at 46 kts	
Min. speed:	75 km/h at 34 kg /m2	
	40.5 kts at 6.96 lb/ft2	
Min. speed:	82 km/h at 46 kg /m2	
	44 kts at 9.4 lb/ ft2	

* Version with wing tip extensions & winglets.

** At wing loading 40.7 kg/m .



POWER-PLANT

The development of a new concept for the power-plant has solved many of the known problems with retractable engine units. Because the foldable drive belt the engine is a stationary installation in the fuselage. This has a particularly positive effect on the size of the exhaust silencer. Furthermore, it provides an improved support of all components of the power-plant. The entire power-plant can be removed after removing only the three screw mounting attachments.The C.G. of the power-plant is below the front mounting attachment point which means that in the case of a crash landing the pilot is protected against the propeller tower-The power supply is provided by two batteries with a total of 14 Ah which are fitted in the inner wing.

ENGINE

Single rotor engine, with liquid cooled housing and with forced air rotor cooling. Carburetted with dual electronic ignition, firing 2 plugs with electrical starting and 18 amp Generator. The rotary engine was developed by the renowned manufacturer NORTON MOTORS, Great Britain, and it is outstanding for its low power-to-weight ratio and its remarkable smooth running. The manufacturer has succeeded in solving typical "Wankel-type" problems. The seals are the latest state of the art technology and through the forced air cooling it was possible to solve the problem of the rotor overheat.

For more info contact:
Eastern Sailplane, John Murray at
513-897-5667 (OH)

Parting Out PIK-20E

Rotax 501 with prop 97 hrs. TTE. Complete Set of Covers. Fuselage smashed. Wings repairable. Also parts for Schweizers and Blaniks. Contact: Ron Percy at Rainbow Flying Service. Moses Lake WA 509-765-1606 Email: ronp@qosi.net

FOR SALE

Fournier RF4, Single-place, Aerobatic, 105mph, 1200cc VW. 1-800-660-0846
mcconeghey@mail.com
www.angelfire.com/ks2/motorglider

Powered Sailplane Instruction & Delivery

Dave McConeghey ATP CFI motorglider
6505 E 44TH ST N Wichita, KS 67226-1483
Home 316-744-9259 Work 316-523-2757
1-800-660-0846 www.angelfire.com/ks2/motorglider
mcconeghey@mail.com

Grob 109B Motorglider For Sale

1984, 900hrsTT, 26:1 glide, 100kts cruise, folding wings Std CofA. Comm, Transponder, encoder, lights, oxygen, barograph. Fresh Annual at time of sale.
Beautiful machine. **$58,000**. Contact Mike Shade, Grob Systems. Bluffton, OH
Tel: 419-369-1210, Fax: 419-369-3328

FOR SALE

2-Place Aerotechnik VIVAT Motorglider
1993 L-135EH 175hrs Total Time
Transponder Mode C, COM, GPS III
Numerous Spare Parts, Trailer included, **$55,000**
O,B.O. J.R. Owings 217-672-3729 (IL)

FOR SALE-PIK-20E 2F

Low Time TT 252hrs, TET 38hr on Rotax 505. Full Panel, Transponder, Parachute, PIK Trailer, Wing Covers, Solar Chargers. **$48,500**
Call Klaus at 719-539-7955
B&J Flying Service

Spark Plugs and Connectors

Chuck Rausch owns a DG-505MB and a PIK-20E. He has had some problems with soot on the plugs in the DG and after some research has discovered why. Here is his report.

Here is an update on the spark plug situation that was a part of my initial report of Ducati CDI problems. As you will remember I found one spark plug that was covered at the top with "soot" and the plug connector was also filled with "soof'. I had suspected that the plug was leaking combustion gases up around the center conductor. I have never been able to check the plug for this leak because I think I need a special fixture to hold the plug while I apply high pressure Nitrogen. Based on a recent observation, I now believe the leak theory is bad.

After the last flight while inspecting the engine, I found the NGK plug I substituted for the Bosch had much "soot" at its top and the connector was filling with "soot" (I had substituted an NGK equivalent B7HS for the Bosch W5AC which I couldn't find at the time). I have logged about 4 hours engine time on the NGK since installed. The "soot" comes from a loose contact between the plug and wire connector. A detailed inspection shows that the NGK plug is nominally 1/1 6 inch taller when measuring from the seal boss, or the wrench hexigon than the Bosch. This added height is enough to keep the Bosch wire connector which comes with the Solo engine from tightly seating on the plug (the Bosch connector uses the wrench hex. as a gripping surface to hold the connector tightly to the plug).The Bosch connector won't slip down far enough on the NGK plug to get a good grip on this hex. An NGK plug in the Bosch connector will show about 1/32 plus of easy movement along the axis of the plug. The "soot" appears to come from a vibrating connection.

The NGK is still a good substitute for the Bosch for a single flight; but, to use the NGK full time, the wire connector should be changed to an NGK connector - - they are available since Rotax uses them. I have NGK plugs and connectors on the PIK and never had this type of problem (replacing the plugs every 12 - 15 hours as recommended by PIK). I have had NGK plugs go "bad" with less than that time; but, remember the PIK is an inverted engine and I have the Bosch non-CDI magneto.

Last point on the Bosch plugs. The DG manual calls for a Bosch W5AC version that has the screwed on connector end swaged to lock it in place to resist loosening from vibration. It was hard enough to find W5AC plugs let alone ask for the swaged version. For a test on the NGK plug while it was installed, I installed a lock washer under the connector and then tightened it hard with vice grips to grab it (the height of this lock washer is not included in the 1/1 6 in. cited in the first paragraph). The connector was still tight against the lock washer when I removed the plug. It may be possible to develop a swaging die to match what Bosch does which only locks a short length at the bottom of the connector - - the connector material is soft and a bench vice will probably provide enough force. Just need to make sure the center conductor is not damaged. The NGK end connectors on the plugs are not swaged and I never had one unscrew by vibration on the PIK.

That's about it on plugs. Stick with the Bosch plugs and watch for loose connectors on preflight. Hope this is useful."

Chuck Rausch 3035 #C Airpark Dr., Santa Maria, CA 93455 Pho: 805-878-5226

News and Views

Grob Motorgliders

Burkhart Grob has been producing sailplanes since 1971. This includes 2,500 pure gliders, 475 G109 Motorgliders and 50 G103C Twin III SL retractable engine self-launchers. The G109 motorglider first flew in 1981 and the 2-place 18- meter G103C SL in 1991. Grob sailplanes are well known for their durability and ruggedness demonstrated daily at soaring flight instruction facilities worldwide. The ASA Membership Roster shows 10 G109s and 4 G103C SLs. Photos courtesy B. Grob.

Left: Four LS-9 self-launchers on the production line at Rolladen-Schneider Factory. Note the German registry numbers and the unique rudder mounted steerable tailwheel.

Right: DG factory production area showing six sailplanes in process. It appears that tail number 8F is a DG-800A.

The Optimum CG of Sailplanes - A Caution from DG Flugzeugbau

Introduction

In the "classic" aerodynamic theory of airplanes the wings generate lift and the tail plane generates stability. Because curved wing profiles are used, the aerodynamic moment generated by the wings which tries to push the nose down and has to be countered by the tail plane. For this the tail plane has to produce downward force dependent on the airspeed and CG. The higher the airspeed and the more forward the CG, a higher downward force is produced. In a rearward CG the tail plane can even produce a lifting force. Most contest pilots trim their sailplanes to the most rearward permissible position. In theory this improves performance, especially in circling flight one does not have to "pull" on the stick as much. At the "German Soaring Symposium" in Stuttgart a paper was presented and discussed which showed these well known facts in graphic detail for several sailplane types.

In the first phase it was researched just how much the performance was affected by forward or rearward CG positions. The permissible CG values are determined by the designer. A forward CG determines the size of the tail plane and elevator, i.e. that sufficient force is available in the elevator to make circling flight possible. The aft CG is determined so that the airplane has satisfactory pitch stability and is able recover from a spin. Generally the calculations for all types showed a performance difference of 1.5 to 2 points between the foremost and rear most CG positions. That is a significant difference! Is it therefore correct to fly with the rear most CG?? Let's think about it.

Performance Factors

The L/D of a sailplane is calculated by the ratio of total lift to total drag. If the tail plane produces downward force the wings have to generate more lift, and that causes increased induced and profile drag, reducing the L/D. In spite of this the rear most CG does not necessarily produce better results. The tail plane is not designed to produce much lift. It normally has an almost symmetrical profile. The wing profile is designed to produce lift and is much better at this task. In addition the tailplane produces a disproportionate amount of induced drag because of it's low aspect ratio. The optimum condition would be one in which the tail plane in slow flight produces just enough lift to compensate for the loss of lift of the wings in the fuselage area. That would minimize the induced drag of the sailplane. This condition is obtained depending on the design of the tailplane with a CG position somewhat in front of the most rearward CG position specified.

Flight Characteristics and Safety

At aft CG stability is minimal, especially in the roll axis, and the sailplane must be "flown" at all times to avoid air speed variations usually encountered when thermaling. Depending on experience and skill, the pilot may tire faster and his concentration can diminish, so that the theoretical advantage is greatly reduced. At the rear most CG the sailplane will enter a spin much easier at less than the minimum airspeed then at forward CG, where spinning in many instances is not even possible. This can have deadly results, especially close to the ground. Different sailplanes react differently, but the tendency is clear. Even an experienced contest pilot should be very wary of choosing the extreme rear most CG position.

Additional comments by Wilhelm Dirks based on the Soaring Symposium Stuttgart 2000

Members of the Akaflieg Braunschweig have once again focused on achieving an optimal center of gravity. They have therefore completed a number of test flights with two ASH - 25 which had been carefully inspected, set up and checked. Both planes were equipped with highly complex measuring equipment due to the expected marginal rate of differences between the two planes. One was declared to be the reference plane, the other was designed to allow altering the center of gravity before every flight. The test flights have been completed with various speeds and flap settings. The results were later evaluated by computer. The specific results are of no real interest for us. A common pilot flies at various speeds with a variety of flap settings during a normal long duration flight. What was of interest to us was the *average result of the test flights.* And even without the complete set of results one thing can be noted: The aft position of the center of gravity is not desirable in order to achieve a really good result. The best results were achieved about 30 - 35 % in front of the aft limit of of the operating limitations for the center of gravity. That is caused by the elevator since it is not in a neutral (streamlined) position with a centered CG. Instead it has to produce lift (with an up elevator deflection) which it's not actually designed to do resulting in increased drag.

Some of our customers who want participate in competitions ask us to carefully weigh the aircraft and set it up at 98% aft center of gravity. Although we generally fulfill all of our customers wishes this is one we should not comply with. The sailplane will not fly any better by achieving this extreme aft center of gravity. It will simply react more nervously to pitch and roll inputs. In fact, should the pilot lose 2 liters (1/2 gal) of water during a long flight (dehydration), the specified limits of CG are exceeded and control in all axes becomes very sensitive. Therefore pilots are advised to choose a CG that is 30-35% ahead of the rearmost limit of the aircrafts CG specification. This will grant an optimum of safety and flight performance.

Submitted by: Karl-Friedrich Weber and Wilhelm Dirks
Translated by Albin Schreiter - CDN Edited by Pete Williams

The Roeger Hook and DG Sailplanes

Most sailplane pilots wear parachutes when flying. Naturally, we do not expect to ever use them. But in an emergency the parachute is only useful if the pilot is able exit the cockpit safely. But that can a problem. It is possible during emergency canopy release for it to move aft a bit and then get pushed down by the slipstream to such an extent that the pilot may have difficulty in shoving it clear. That uses up valuable time. Even worse, the departing canopy can strike the pilot on the head.

To avoid such a situation Prof. Roeger of the Technical University Aachen invented a special hook, since named for him. After the emergency release the hook causes the rear canopy frame to rotate around it and prevents the canopy from moving aft. The slipstream flowing into the cockpit cannot escape and therefore lifts the canopy, which rotates on the Roeger hook and forces the front of the canopy to lift off first and then depart aft over the tail fin. Such a Roeger hook has been a mandatory installation in all new sailplanes for some years.

However, many older sailplanes are without a Roeger hook. In the spring of 1999 a pilot in the U.S. died after a mid-air collision after pulling the canopy emergency release. He remained seated in the cockpit and never released his seat harness. Analysis of his head wounds showed that he had been knocked unconscious by the left side of the departing canopy frame.

DG offers a solution to this problem which can be retrofitted to older sailplanes and perform the function of a Roeger hook by installing a small spring loaded pin which is fixed to the canopy in the rear position. This causes the slipstream to lift the front of the canopy up and over the pilot.

A kit is available from DG for models DG-100, 200, 300, 400, 600 and 800. The cost is very reasonable, about Euro 45 plus applicable taxes and shipping. It takes about three hours to install. DG believes this is an important and a significant flight safety improvement.

Submitted by Karl-Friedrich Weber, President DG Flugzeugbau

SOLO Engine Installation
in the DG-800B-Some Tips

Steve Eddy removed and reinstalled the Solo engine in his 800B. While the Maintenance Manual covers the procedures for removal, it simply states “reverse the process for installation”. Steve had rigged a unique way to support the engine while preparing for installing by using a sturdy metal ladder and “hanging” the prop tower above the fuselage and supporting the engine underneath with a wooden saw horse (see photo). This allowed adequate room to install accessories and systems in roughly the following order.

With the engine suspended and well aft of the firewall, install:

1. Prop Tower to Engine Bolts: This attaches the engine to the prop tower.
2. Starter Ring Gear and Lower Drive Sprocket
3. Drive Belt to lower sproket. Loosen the top pulley then tighten after drivebelt is on the lower pulley.
4. Starter
5.Water Pump at the firewall

6.Move the fuselage so as to position the tower over the engine bay slightly aft of the hinge points. Place pillows or blanket in the engine bay over the muffler.

7.Detach tower from the ladder and using 2 persons lay the tower with attached engine horizontal in its bay.

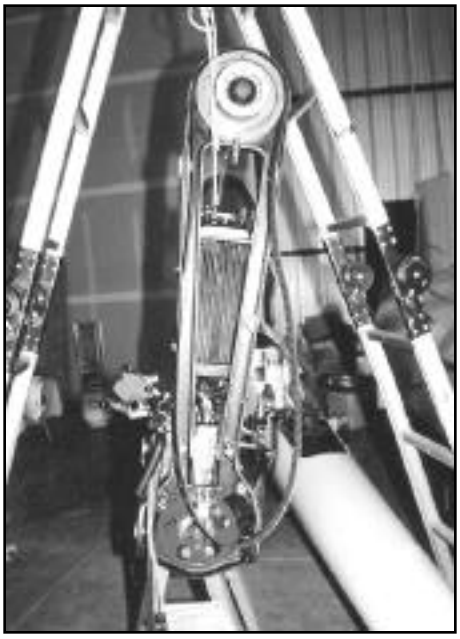
8. Fit the Prop Tower Hinge holes between the Fuselage Hinge attachments and insert the hinge bolts and bearings into the fuselage hinge holes. This requires each hinge bolt and its bearing to be aligned properly. Move the prop tower up and down and fore and aft as required while tapping each bolt into place. Tighten the bolts so that the bolt head flat is captured by the bent down edge of the retaining washer. The tower is now hinged to the fuselage.

9. Screw jack Arm and Strut. Using the manual system extend the screwjack arm to engage the attachment at the tower. Connect and then raise the engine and attach the gas strut arm.

Connect the following by raising and lowering the tower as required:
10. Radiator Hoses
11. Muffler Lifting Cable
12. Flywheel Braking Cables
13. Fuel Hoses to Carb
14. Throttle Cable at Carb
15. EGT Connections at fire wall
16. Plug to DEI at fire wall
17. Starter Ground and Power cables.
18. Tie wrap wiring bundles, fuel and water hoses as necessary.

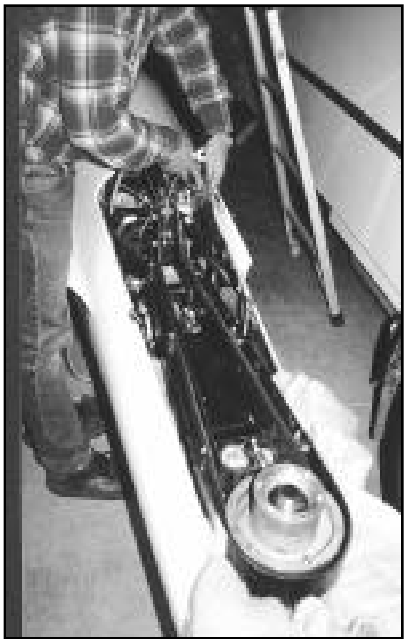
They key to this operation is to work slowly by first attaching parts to areas that are hard to reach after the tower is hinged. Double check all attachments, observe bolt torque values and use locktite. Excercise the retract/extract cycle several times and check clearances especially the water hoses near the starter ring gear. Time: About 4 hrs. *Submitted by Steve Eddy and Pete Williams*

Prop tower hanging from ladder and engine resting on a saw horse. Items 1-5



Tower with attached engine placed over the fuslagecavity in preparation for attaching to hinge bolts.Item 6.

Tower is attached to hinges. Items 7-18



TeST Self-Launching Sailplanes Production, Delivery & Costs

The following is a Spring 2001 report from Zybnek Jaros one of the owners of TeST.

Production: 20-25 airplanes/ yr. 14 currently on order.
Delivery: 8-10 months.

Costs (ex-factory):

Kits:
TST-3 $7,300 (pure sailplane)
TST-8 $10,000 (pure sailplane)
TST-3 Self-Launcher $10,000 (including retractable mechanism and some minor options)
TST-8 Self Launcher $12,500 ((including retractable mechanism and some minor options)

Ready to Fly:
TST-3 TM Self-Launcher $18,000 (basic model) or $19,500 (with options)
TST-8 DM Self-Launcher $ 26,500 (basic model) or $29,500 (with options)

Trailers:
For TST-3 $3,540
For TST-8 $4,480

****Shipment:**
To most US East Coast ports about $3,000.
To most US West Coast ports about $3,500

**By using 40 ft containers for multiple orders, more airplanes can be loaded into one container at a considerable decrease in shipping costs.
Contact Zybnek Jaros, Dobrovskeho 78, 612 00 Brno, Czech Republic, Pho/Fax ++420-5-4924 9073
Email: <jaros@infoline.cz> Web: <www. test.infoline.cz>

DG Solo Users Group Formed

Jim Herd has established an ongoing email dialog with most of the USA DG owners. This group shares useful information about techniques and problems encountered while flying or maintaining DG 800/808 and 505MB models. Pilots interested in receiving or sending emails from/to this group visit web site:
http://groups.yahoo.com/group/DGSoloUserGroup
or contactJim Herd at <jherd@home.com>.

MOTORGLIDER FLIGHT CHECKOUT INSTRUCTION AVAILABLE

CFIG Mike Moore recently took delivery of a 2-place DG-505MB and has teamed up with two other CFIGs to offer flight checkout instruction to new MG pilots. The 505MB is located at the Minden-Tahoe Airport, Minden NV. To schedule contact Mike Moore at 775-782-1224 PMs, Email <soarmoore@aol.com> or Bob Davis at 775-329-2825. Instruction is available year round.

The TST-8 DM (above) is a 15.6 meter 2-place ship with a maximum takeoff weight of 959lb. Max L/D is 28:1 at 62mph. **The TST-3 TM** (below) is a 13.8 meter single place ship with a maximum takeoff weight of 650lb and an L/D of 33:1 at 53mph. Both ships are constructed of wood and composites and are powered by a Rotax 447 or Hirth F-33 for the TST-3 TM or a Rotax 503 for the TST-8 DM.

More on The Frigata J-6 Motorglider

The J-6 is a nice flying aircraft and uses a side-stick controller. Ground steering is good. Rate of descent with the engine off is about 250-300fpm. Fuel consumption is 1.5 gal/hr at 70-75 kts. Top speed checked with GPS is 120kts at 6,000 rpm. 4,500rpm provides a cruise speed of 75kts. The visibility is excellent and the cockpit seating position is very comfortable. The spoilers are quite effective for speed and glide path control during landing.The all-aluminum trailer designed for the aircraft is well made and has automatic braking. I have been flying my Frigata since last September and have been designated a USA dealer by J&S Aero Design, the Czech manufacturer. Interested persons can contact me at Andrew S. Ross, P.O. Box 188,West Lebanon, NY 12195 (518-794-9220 or Email andyjuneross@webtv.net) or at P.O. Box 895. Salome, AZ 85348 (520-859-3338 Email andyjune ross@mymailstation.com)
.....*Submitted by Andrew Ross*

ASA Mission

The **A**uxiliary-powered **S**ailplane **A**ssociation, 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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Publishing Information.....

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 typewritten 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 2nd week of 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!***

Auxiliary-powered Sailplane

NEWS

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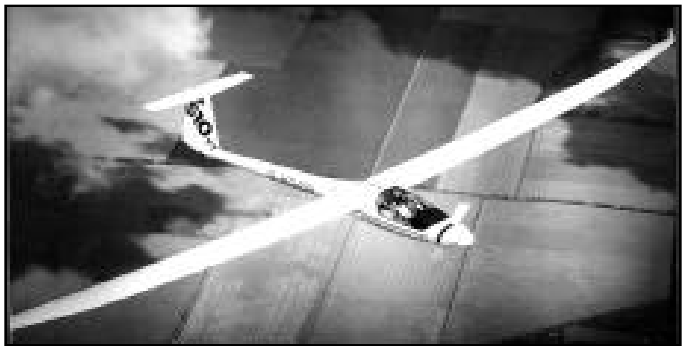

See 1-page Insert for information about flying a contest in a Stemme Motorglider

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