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

Volume XIV Issue #89 ASA Web Site: www.motorglider.org **November-December 2002**

President's Message...

This is my last column as President of ASA. After 3 years in office, it is time to hand over to new blood. I am delighted to report that Skip Atwell, a founder member of ASA, has agreed to accept office in my place.

Lloyd (Skip) Atwell, ASA's new President, has been an SSA member since 1988. Skip has a Gold badge and has owned two DG-400s. He flies primarily from the Sky Soaring club at Huntley IL. He lives in Lake Geneva WI with his wife Mary, and is now retired from a 35 year career as an educational professional.

The 2003 SSA Convention, which will be held in Dayton OH on January 23 thru 25, 2003, will feature a number of ASA events. These include the ASA Breakfast on Saturday January 25 at 0730. The annual meeting of ASA members will be held during the breakfast – see elsewhere in this issue of the *News* for formal notice and details. ASA will also present two workshops on engine operation, maintenance and troubleshooting (Eric Greenwell on the MidWest and Gary Evans on the Solo), details of which also appear elsewhere in this issue of the *News.*

Lastly, I would like to thank all of you who have given me support during my period of office. I am a wiser and, hopefully, humbler person (and pilot) from the experience! See you in Dayton!

Dean Carswell

Frank App assists Pete Williams during an engine runup of Frank's "Russia"

FIRST IMPRESSIONS OF THE AVIASTROITEL AC-5M "RUSSIA"
By Pete Williams

In mid-July 2002 I had the opportunity to look over ASA Member Frank App's AC-5M Russia self-launcher. Frank normally operates out of the Truckee Airport but was at the Minden-Tahoe airport for a few days. Frank has had his 5M since October, 2001 and has put 25 flights on the ship. A retired Real Estate Appraiser, Frank has a total of 80 soaring hours with some time in an ASW-17. He has made some revisions to his carb intake throat to boost power and is thinking about an extractor type muffler system to further increase power.Truckee Airport is 5,900 msl and Frank said he will not self-launch there or anywhere else unless the density altitude is 7,500 ft or below.

I noticed during a taxi attempt on a windy afternoon at M-T airport Frank was having problems steering the Russia which has a tendency to weather cock in windy taxi conditions. Its tail wheel is non-steerable but Frank says if he is careful a short blast of power can perch the bird on its main wheel so the rudder can assist in steering. As it turned out he had to get the bird towed to the takeoff position. It was indeed a windy day. His takeoff run was about 1,500 ft for lift off and the Russia climbed out at 2-300 fpm. The density altitude for that day was slightly over 7,500ft. The power output of the single cylinder engine under standard conditions is 25hp. Due to the density altitude it is estimated the engine was producing about 21hp. This level of takeoff performance is about the same as the Ventus CM which is heavier but has more wing area and about the same hp and wing loading of 8 lb/sq/ft.

Continued on page 3.....

Russia *Continued from page 1*

Frank gave me a tour of the ship and allowed me to sit in the cockpit while the engine was started. Throttle response was immediate and the noise level was high. I found that a smooth idle was possible at or above 3,000 rpm. Below that there is a lot of vibration which is typical for a 2-stroke. The painted finish was good and the cockpit really spacious compared to my DG-800B. It was like sitting in a tank. Controls came to hand easily and it was noted that when all control levers are forward the bird is in flying condition..gear up and engine stowed.

The most unique feature to me was the way the all-mechanical system (no cranking wheel or chain) extracts or retracts the engine...all in 3 sec. or less. This system is a model of simplicity and does away with electric screw jacks and relays. Somehow this reminded me of the difference between the MIG-15 and the North American F-86. One simple and rugged. The other state of the art and dependent on sophisticated electronics. Frank said his all-up cost was a lttle under $40,000 including shipping, instruments and trailer. Thanks again, Frank, for allowing me to look over your ship.

Above: Frank App is enthusiastic about owning and flying his AC-5M.

Right: The engine in the the ready to start position. Only two small doors remain open to minimize engine extended drag.

Bill Lewis pilots his Katana Extreme on short final to his grass strip near Maryville, TN.

The touchdown will occur almost in front of his hangar (left) followed by an uphill rollout while holding the nose wheel off of the turf. The field is 910Ft msl, approximately 1,000ft long and between 200 and 300 ft wide. Note the tree top in the lower right hand corner. Bill says cross winds can be a challenge due to the wind eddies created by the tree lined strip.The photos are by Russ Hustead of Sky King, Payson, AZ who was Bill's instructor. Bill has recently taken delivery of a DG-808B and has checked out with Andrew McFall of Soar Minden in a DG-500. He plans on flying out of a nearby paved strip in the 808 until he feels qualified enough to to make a reasoned decision to use his grass strip. Bill has time in Ultralights and Balloons and is relatively new to self-launchers. He is a retired president of a National Sales Rep organization which at one time had 99 employees. At this writing Bill is getting familiarized with his 808B having made several flights from paved runways. He made his maiden flight at La Grange, GA. Gary Flandro, a nearby DG-808B owner is assisting Gary in his transition to a self-launching sailplane.

Above: Bill after maiden flight at La Grange, GA.
Below : 808B in Bill's hangar.

The Electrical Power Shortfall in Today's Gliders

The advent of Flight Directors, Electronic Varios, Data Loggers, Transponders and Encoders has placed a real burden on available battery power in sailplanes. Gone are the days when the only drain on the battery was the radio and an electric powered flight director.Add a power plant to the sailplane and the demand for electric power is even greater. A single Sealed Lead Acid (SLA) gel cell 7.5 ah 12V battery normally used in a non-powered sailplane is not an adequate source of power. Pilots are adding a second and third battery to meet the need for increased electrical power. The problem is both non-powered and powered sailplanes have limited space for additional batteries. This has yet to be addressed by sailplane manufacturers. Yes, some sailplanes do have provisions for two batteries but many pilots are in need of three. Yes, some sailplanes use a switch that permits the pilot to switch between power sources as needed. In my opinion there is just not enough space in most sailplanes to install an additional battery or a physically larger battery with more capacity. Pilots will be surprised when they discover how much battery power is needed by simply adding up the amperage drain of all electrical instruments used in a typical flight of four to five hours.

Charging: There remains the need to recharge completely in preparation for the next flight. This can be done by removing the batteries and using a standard wall charger or a solar panel with a charge controller can be used and the batterys can remain in the sailplane. When solar power is used for recharging it is important to remember a larger panel will recharge in a shorter period of time. Some charge controllers are tunable and can be set at a higher voltage shutoff figure to more completely deep charge the battery. Pilots should read the specifications of their particular battery to learn the allowable shutoff voltage value. There are solar charge controllers that can charge two battery systems simultaneously. As a rule of thumb a 10 watt solar panel is the minimum size for an output of 600mah which is the same output of most wall chargers. Dual 10 Watt solar panels can charge 2, 3 or 4 batteries at the same time using specially configured solar charge controllers. To charge a SLA battery, a DC voltage higher that the open circuit of 2.15 volts per cell is applied to the terminals of the battery. Any of the conventional charging techniques may be used, but to obtain maximum service life and capacity, along with acceptable recharge time, constant voltage-current limited charging is recommended. During constant voltage or taper charging, the battery's current acceptance decrease as voltage and state of charge increase. The battery is fully charged once the current stabilizes at a low level for a few hours.

SLA (Sealed lead Acid) Batteries: Lead Acid batteries by nature need to be constantly charged. If a lead acid battery becomes fully discharged, it is imperative that it be given a full charge immediately. This will prevent internal "sulfation" from occurring which is a condition that will permanently destroy the battery. Gel or sealed lead acid batteries are basically the same chemistry as a wet (flooded cell) battery. The batteries' electrolyte is in a gelatin form and is absorbed into the plates and the battery is sealed with epoxies. These batteries may be used in any position and are exceptionally leak resistant. These batteries are 2 volts per cell so the common batteries are 2, 4, 6, and 12 volt.

Sulfation: Sulfation is the formation or deposit of lead sulfate on the surface and in the pores of the active material of the battery lead plates. If the sulfation becomes excessive and forms large crystals on the plates, the battery will not operate efficiently and may not work at all. Common causes of battery sulfation are standing a long time in a discharged condition, operating at excessive temperatures, and prolonged under or over charging.

Discharging: In general, a lead acid battery ***cannot*** tolerate as deep a discharge as a NiCad battery or NiMH battery. Sealed lead acid batteries function best if they are discharged to only about 85% of nominal voltage (10.2V on 12V battery).

BATTERY CARE TIPS

1.Always keep lead acid batteries fully charged so that a constant trickle charge is on.
2. Store lead acid batteries in a cool, dry location. Never store your batteries on ground, metal or cement surfaces.
3. If stored for more than 90 days, give your batteries a full charge.
4. Warmer temperatures adversely affect shelf life and need for recharging.
5. Charge them after each use, no matter how short the usage. Remember it is good to do a Top-Off charge for SLA.

Ambient Temperature : The rated output capacity of a battery is based on an ambient temperature of 25C (77F). Any variation from this operating temperature can alter the performance of the battery and shorten its expected life. High temperature reduces the battery life greatly. A good rule of thumb when determining battery life in relation to temperature is that for every 15F average annual temperature above 77F, the life of the battery is reduced by 50 percent.

Battery Capacity: Battery capacity is determined by the battery's ability to convert chemical energy into electrical current at a specified rate for a specified amount of time.

Battery Chemistry: No battery will last forever-- even one that experiences minimal use. This is because sealed lead acid batteries are Electro-chemical devices whose ability to store and deliver power slowly decreases over time. Even if all the guidelines for proper storage temperature and maintenance are followed, the battery must be replaced after a certain period of time. For sailplane use this is normally every 3-5 years.

Cycling**:** At installation, the battery is at 100 percent of rated capacity. Each discharge and subsequent recharge reduces the relative capacity of the battery by a small percentage. The length of the discharge cycle will determine the reduction in battery capacity. The "loaf of bread" analogy is most often used to illustrate the relationship between cycling and battery life. A loaf of bread can either be cut into many thin slices or a few thicker slices. Similarly, a lead battery can provide power over a large number of short cycles, or fewer cycles of longer duration.

Continued on Page 5.....

DG-808B HIGH CHT PROBLEM SOLVED

For those of us blessed with summer temperatures that might reach 115F the Solo cooling system is hard pushed to keep engine heat under control. This is my first year with the glider and as we moved into summer I watched the cylinder head temperature climb to the 95C redline and then finally pass it. At 105 - 110F air temperature the cylinder head temperature would climb pass redline at the rate of 1C/30 seconds. This is even with an over rich fuel setting. The stock radiator cap is rated at 1.2 bars (17.4psi), which at the stock antifreeze mixture of 50/50 would yield a boiling point of about 275F. Even just straight water would still have a boiling point of about 255F (124C) so there is room to lower the antifreeze mixture. As the antifreeze mixture is increased the boiling point is raised but unfortunately the mixtures ability to transmit heat is lowered. The factory recommended changing to a mixture of 20% antifreeze and 80% water. To this I added 2 ounces of a product made by RED LINE called Water Wetter. This product reduces water tension, which also promotes improved heat transfer. They claim a temperature reduction of 18F over straight water and the product has long been used in racing engines. This combination yielded a maximum cylinder head temperature of 91C during climb out when the surface air temperature was 108F. *Submitted by Gary Evans*

.....Battery Shortfall Continued from page 4

Maintenance and Service: The final factor to consider is the maintenance and service of the batteries. The gradual decrease in battery life can be monitored and evaluated through voltage checks, load testing and retorquing connections.

Charge Cycle Limit initial current to 0.20C (C is the nominal A.H. capacity of the battery). Charge until battery voltage (under charge) reaches 2.45V per cell (14.7V for a 6 cell 12V battery) at 68 degrees F. Hold at 2.45 volts per cell until current drops to approximately 0.01C ampere. The battery is fully charged under these conditions. (A properly designed wall charger or solar charge controller can accomplish this type of charging cycle).

Battery Power Discipline: For the sailplane pilot, conservation of battery power is the name of the game. Turn off what is not being used starting with the VHF radio which drains the battery in both the transmit and receiving mode. Leave the Transponder off when not in or near a controlled air space. Turn down the volume of audio varios. Install a voltmeter to keep tabs on battery conditions. If transponder equipped, a separate battery should be installed to power the transponder. With a powered sailplane leave the solar panel plugged in when raising the engine on the ground and disconnect the panel just prior to entering the cockpit. Make sure all battery connections are tight and the connectors are properly mated. Every battery should be tightly secured as they can become missiles during a sudden stop. Consider fabricating a battery box for each of your batteries. At the end of each flying day place the batteries on charge.

SLA Battery Information Source: AGT Battery Supply. Submitted by Pete Williams

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TeST TST-10's First Flight

The Czech 15-meter TST-10 non-powered version prototype has been successfully flown. When tests are complete a Rotax 447 engine will be installed and flight tested.

Parting Out PIK-20E

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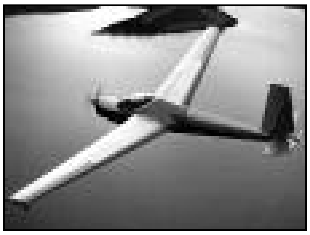

FOR SALE: 1993 VIVAT L-13 SEH Motorglider

200hrs TT, com, gps, 95mph@3.5gph or 25:1 with prop feathered. Trailer and spare parts included. $38,000 217-672-3729 (IL)

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A REPORT FROM DOUG EASTON

DG-800B Serial 147
TTAF 23 hours; TTE 3 hrs SMOH

Some items that came up in my annual inspection that are worth checking on when your's comes up (or before):

1. Significant cracks in the exhaust manifold to muffler coupler were noted and a new one installed.The design of the coupler has been modified by the factory to address the cracking issue. You can identify the old design by the heat shield which is welded to the forward rim of the coupler and also welded to the spring attachment bracket. In the new design the shield is welded only at the front, the rear floats. Installation of the new muffler coupler was complex due to the tight clearances. In the end we had to remove some material from the front of the coupler to allow it to clear.
2. Minor crack on the muffler at the upper spring attachment bracket for the coupler. This appeared be repairable but the muffler was replaced instead because a modification to the muffler attachment points allow for much less distortion of the muffler to frame attachment springs. If you are planning on welding the muffler the material is Werkstoff no: 1.4576. The equivalent in the U.S. is ER318 which is tough to get but was recommended by a metallurgist as a safe alternative.
3. Rubbing noted at the rear of the muffler. Seems like the muffler was contacting the muffler frame resulting in wear. To see this you have to get in there with a mirror and a flashlight.
4. Two of Exhaust Manifold bolts were loose and were very difficult to get at. I cut down an Allen Key and used a small wrench to get em tight. *Submitted by Doug Easton* <dougeast@ix.netcom.com>

Auxiliary-powered Sailplane Association, Inc.

Annual Meeting of Members, Saturday January 25, 2003

NOTICE is hereby given that the ANNUAL MEETING OF MEMBERS of the Auxiliary-powered Sailplane Association, Inc. will be held at the SSA Convention in Dayton OH on Saturday January 25, 2003 at 8.00 am. All members are entitled to attend and vote at the Meeting. By order of the Board of Directors

Note: (1) The Meeting will be held in conjunction with the ASA Breakfast at the SSA Convention; members do not require to go to the breakfast to attend the Meeting. The business of the Meeting will include the election of Directors in place of those retiring. If you wish to nominate a person for election, or place other business on the agenda, please do so in writing to the Board of Directors, Auxiliary-powered Sailplane Association, Inc., c/o 8041 Jordan Lane, Midlothian TX 76065-5956, USA.

(2) If you wish to attend (i.e. eat at) the ASA Breakfast, you need to register for the SSA Convention and sign up for the breakfast. See the news item "2003 Convention" on the SSA webpage (www.ssa.org) or the Convention advertisement in *Soaring* magazine.

ASA To Conduct Motorglider Workshop Sessions at 2003 SSA Convention

To bring prospective and existing pilot-owners more up to date on operating and maintaining the Solo and Wankel Rotary engines ASA will be providing two sessions at Dayton. The speakers will be Gary Evans and Eric Greenwell. Persons attending the convention can obtain details of times and locations from the Convention Speaker's Schedule. The primary objective of these sessions is to provide useful information from pilots who have hands on experience flying and mantaining a powered sailplane with these types of power plants.

A Flight Test Evaluation of Alisport's Silent IN Self-Launcher

By Gary A. Flandro

Here is my analysis of the Silent IN based on detailed examination of the airframe, several flights, and observation of flights with Leo Bennetti-Longhini at the controls.

First tests were conducted with the demonstrator (Registration I-5693), which did not have several of the new features which make the glider a very attractive package. During the course of the testing, Leo returned from Italy with some upgrades including new forward floor panel with recesses for the pilots heels, wingtip wheels, and some detailed improvements in the motor installation.

The glider is very attractive in all respects. Close attention has been paid to avoidance of complicated parts or subassemblies. The use of a simple single cylinder engine without any frills and a one-bladed are examples of this design philosophy. There is much evidence of careful craftsmanship throughout. The finish is excellent, and is certainly as good as any ships produced by the best German shops. Paint is polyurethane, which is best for a long finish life especially when operating at high-altitudes.

Assembly is quick and easy with two persons; wings are very light so that the wife or even a child could handle the tips during assembly without complaint. Leo's recent SHA article describes the details of the construction and design, so I will focus here only on operational and performance matters.

I have had some motorglider experience (DG808B and Schleicher ASH 26E) so a short ten minute familiarization with the cockpit and control layout was all that was necessary to prepare for my first flight. Seating position and controls are all very good; however, the control levers for the propeller stop and door latch are on the left side and a little too low and to the rear for my liking. Otherwise everything was in easy reach and view. Motor starting is very simple, controls are intuitive, and motor instrumentation is minimal. Response to the throttle is very quick, and upon selection of full throttle for takeoff, the glider settles down onto the nose wheel and accelerated quickly to takeoff speed. We measured the ground run under zero wind conditions, and found that average takeoff distance is less than 450 feet at a field elevation of 1080 ft (Tullahoma Airport). This is actually a shorter distance than claimed by the factory (500 ft on paved runway, 590 ft on grass)

The glider flies smoothly at full throttle and climbs at a rate at least equivalent to that produced by a good tow plane. We made several tests of the climbing performance by timing the climb. Climb rate adjusted to sea level conditions is approximately 450 ft/min. At a density altitude of 6000 ft, we measured a comfortable 340 ft/min.

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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, 9541 Virginia Ave. South Bloomington, MN 55438 Pho: 952-941-5683
EMail: <Utleyb@aol.com>
USA Dues: $20-1 yr, $38-2 yrs, $55-3 yrs.
International Dues: $25-1 yr, $48-2 yrs, $70-3 yrs.

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Publishing Information.....

Pete Williams, ASA Publications Manager, is the Editor, and Print Production Manager. The newsletter is printed in Minden, Nevada and mailed First Class. Contributors can mail hardcopy text or use Email. Text may be edited as required to fit the newsletter. Photos are always welcome. 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!***

CLASSIFIED ADVERTISING RATES
50 cents/word, prepaid for 2 insertions. Contact Pete Williams for Display Ad sizes and rates.

Newsletter published Jan/Feb; Mar/Apr;May/June; July/Aug; Sept/Oct; Nov/Dec

Silent IN Evaluation continued from Page 6

Vibration levels are quite tolerable - certainly much lower than in my DG808B. Noise levels are acceptable, but earphones are highly recommended.The engine shutdown procedure is very simple and intuitive: after a short cooling run, ignition switched off, set the propeller stop, bring the propeller to the vertical position with a few taps of the starter button, and then retract the engine and lock the engine doors with the levers already described. Just as easy as any of the other ships I have flown.

The Silent has very good free-flight characteristics. Good roll rate due to the short wings and full span flapperons. Pitch stability is excellent, and response to elevator corrections very good. The trim settings should be adequate throughout the speed envelope for the ship. Performance is clearly very good for a glider with a short wing (12 m span). Airfoil and wing planform are obviously good choices for a ship of this size and intended range of operations. We made no serious attempt to verify the factory claim of maximum L/D of 31:1. I felt that this glide ratio is most probably achievable with this machine. The ship thermals nicely and will probably out climb most 15m gliders because of the low sink rate.

Landings were no problem, and the excellent air brakes allow very short landing distance (approximately 400 ft). The glider can no doubt be comfortably operated from very small airfields.

With several new improvements now available (forward-hinged canopy, wing-tip wheels, steerable tail wheel, improved trailer and ground handling equipment) this glider should be the front runner in the expanding light self-launcher market. The glider is available both ready to fly and in kit form. I had the opportunity to examine the building instructions and drawings (English translation) and find them to be excellent in all respects.

Also of interest to prospective American buyers is that the U.S. dealership is operated by a very experienced and capable young man, Leo Bennetti-Longhini who speaks both fluent English and Italian. It is very important to be able to communicate with the factory when placing orders and when maintenance issues arise. Leo has full service capability for both the engine and airframe already in place.

Editors's note: Gary A. Flandro, Ph.D. is the Boling Chair Professor of Advanced Propulsion at the University of Tennessee Space Institute at Tullahoma, Leo's comment after flying Gary's DG-808B was" its in a different performance league but gave me a nice analogy of Miata v.s. Viper"
APS News thanks both Leo Bennetti-Longhini and Gary Flandro for this timely evaluation of the Silent IN.