

APS NEWS

The Official Publication of the Auxiliary-powered Sailplane Association, Inc.

Volume XV Issue # 95

ASA Web Site: www.motorglider.org

November-December 2003



You are looking at Silence, a new high performance single seater ultralight with electric operated flaps and landing gear. Silence is flying, certified and orders are being taken by Silence Flugzeugbau, a new and wholly-owned subsidiary of DG Flugzeugbau. This new company will build and market Silence from DG's Bruchsal, Germany facility. Silence designers Matthias and Thomas Strieker will fill key positions in this new venture. This is a "performance" aircraft that contains many technical innovations not normally found in ultralights. According to DG President Karl-Friedrich Weber " This seems to be a big market, which allows us to look into the future more patiently. It has also been a big job to install the production and marketing in Bruchsal. We will deliver the first kits starting October 2003 and the complete aircraft in the Spring of 2004." Estimated prices are \$98,000 for the ready built and \$55,000 for the kit-built version. This includes basic instruments, radio and shipping.

For more information <antji.lehner@dg-flugzeugbau.de> or web site: www.silence-flugzeugbau.de

Dimensions

Length.....20ft 3in
Height.....5ft 1in
Span.....24ft 6in
Wing Area.....93.8 sq ft

*Weights/Loadings

Empty Wt.....462 lb
MGW.....750 lb
Useful Load.....288 lb
Wing Loading.....8 lb/sqft
Power Loading.....9.4 lb/hp
Fuel Capacity.....21USG
Vn.....6GPos/4GNeg

*Performance

Vne.....162kts
Va.....97kts
Cruise.....108kts
Stall.....35kts
Climb Rate.....1,600fpm
Range.....807 sm

Engine/Propeller

JABIRU 2000
4-cyl/4-stroke 80 HP
2-blade or 3-blade electrically
adjustable variable pitch

Systems

Flaps and Landing gear actuation is electric requiring 3 sec to lower full flaps (30 degrees). 9 sec for gear extension. Main wheel disc brakes are toe operated. * Estimated



The Alisport A302efi Engine

By Leo Benetti-Longhini

USA Dealer for the Silent Glider Line

Editor's Notes: This article was generated by several questions directed to Leo concerning the engines currently used in Alisport's Silent IN light self-launchers.

Q. Does Alisport have a contract with Zanzottera to assemble the engine?

A. No, this is not the case. The Zanzottera name is no longer synonymous with light aircraft engine and they no longer manufacture any of the MZ components. Compact Radial Engines of Canada now manufactures and markets the MZ series exclusively.

A new engine, the Alisport A302efi, was introduced with the self-launch Silent 2 and is now standard on both aircraft (replaces the previous A300efi used up until now on the 12m gliders). The engines were designed and developed specifically for the self-launch application via the collaboration of several key companies. Components are furnished from a variety of sources (Zanzottera included) and are assembled/tested in-house by Alisport. Note that Zanzottera now manufactures engines for autonomous and remotely guided military aircraft (they do not produce engines for human-carrying aircraft). The production rights to the line of ultralight engines that they developed were sold to Compact Radial Engines of Canada (sold as the MZ line). The Alisport engines certainly have some components in common with the MZ engines. Most of these are items such as gaskets (intake, cylinder, and exhaust), bearings, wrist pin, decompression valve, generator, etc. Overhaul level of effort is similar too.

Q. What is the reliability history so far of the FADEC fuel injection system and where has it been used before?

A. The fuel injection system comprises proven components from well known sources. For example, the electronic control unit (ECU) is manufactured by Walbro (major US automotive supplier), the fuel injector and pump are Bosch, and the throttle body is a Bing. The componentry alone is relatively straightforward and simple (by modern engine standards), however significant engineering development went into mapping and programming of the ECU for the self-launch application. The FADEC system has been very reliable. There have been no reports of any FADEC related problems in North America. The factory records show one failure of an ECU in European it was due to a faulty ground wire. Some of the Zanzottera military engines are also fuel injected and I believe that there are some components in common (the Alisport engines are single-cylinder powerplants whereas the military units are not). All self-launch Silents currently in the US have the A300efi engine. The first Silent aircraft with the A302efi arrive in the Fall of 2003.

Q. Outside of the injection system, have any engine components have been modified?

A. As mentioned previously, the Alisport engines were developed specifically for the self-launch application. The external features make it look like the MZ engines, but this is due to the use of some modular components and related design origins. *Continued on Page 6*

Senior Pilot Assist, #2

by Robert Lee Moore

Friend (and fellow PIK20E pilot) Glen Reiboldt came up with a tail boom lift assist. He simply placed a cradle of the same radius as my aft tail boom on top of a little off-the-shelf Hydraulic Trolley Jack. The jack has two wheels at the front and two casters at the rear, which makes it easy to position or to roll it around - simply pulling it by the removable handle that pumps it up. The cradle had to be fabricated. It is rated at two tons, so hardly knows that it is lifting 100 pounds of glider tail! Ours, made in China and quite inexpensive, weighs 28 pounds (a handle is provided for lifting it), but lighter-weight ones are available. This has solved my tail dolly removal problem. It is nice to have clever and generous friends!



The Whisper Motorglider



The Whisper Motorglider is an all composite 2-seat motorglider for assembly by the owner builder. Registered as an Experimental aircraft / glider. Supplied as partial kit with assembly instructions/ plans. The Basic Kit includes all airframe components pre-moulded, apart from wings, horizontal tail and rudder which are manufactured by the builder from factory cut foam cores using mouldless construction techniques. The Construction Manual is picture based with easy to follow steps for all phases of the assembly process. It was designed and built by Russell Phillips of Port Elizabeth, South Africa. Russell has over 20 years experience in building and restoring a number of aircraft. Plans are to be able to start shipping kit components in early 2004.

This aircraft is aimed at the pilot who requires a machine with reasonable soaring capabilities yet has the ease of operation of a power plane and reasonable cross-country performance. Other aircraft available in this market are the Grob 109 series and the Dimona. Both of these aircraft are factory built and "used" examples are costly and somewhat difficult to obtain. The Whisper has many similarities to the Grob and Dimona. The differences are essentially the tail configuration, the positioning of the occupants and the method of wing construction. The Whisper wing uses a solid foam core built using a "mouldless" technique. This technique is well suited to the home builder as it is inexpensive and yields a lighter wing than traditional moulded wings. The Whisper wing is approximately 60% of the mass of a Dimona wing (with the same strength).

The power plant for the Whisper is the Limbach 2000 or an equivalent VW. A Jabiru option is also planned. The preferred propeller is the Hoffman 3 position unit, however a simple fixed pitch wooden prop can also be used.



Specifications:

Wingspan 52.5ft

Wing area 161.46sqft

Aspect ratio 16

Length 23.5ft

Empty weight 992lbs

Max all up weight 1,587lbs

Fuel capacity 22.4 gal.

Engine Limbach L2000 80hp

Prop Hoffman 3 position

Performance:

Rate of Climb (maxgw/sl) 700ft/min

Max level speed 113kts

Cruise speed (75% power) 95kts

Cruise fuel consumption 3.2USG/hr

Range 746 stat mi (no reserves)

Takeoff run 590ft

Min sink speed 177fpm at 43kts

Glide ratio 1:28 at 57kts

Vne 132kts

Stall speed 38kts

Va 85kts

Postal Address:

Whisper Aircraft

P.O. Box 5503

Walmer

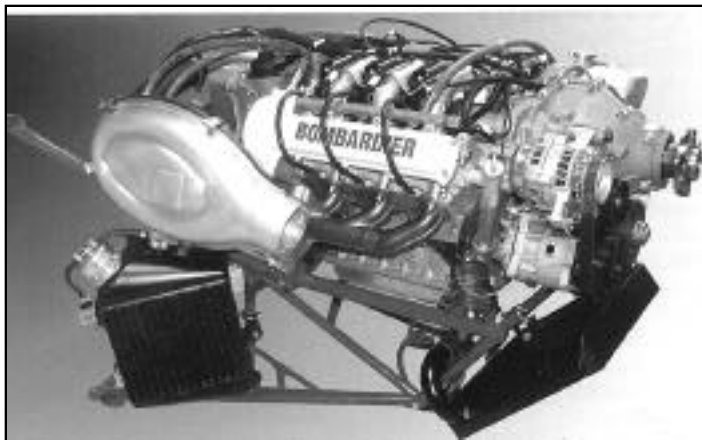
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Web Site: <www.whisperaircraft.com>

NEWS BYTES

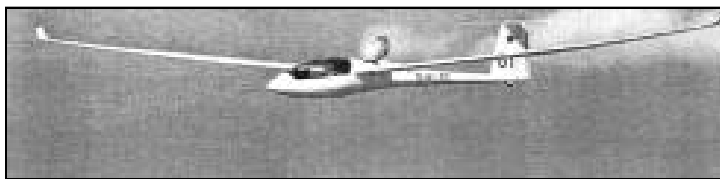


Bombardier-Rotax has produced over 100,000 Rotax aircraft engines currently used in light, very light and ultralight aircraft including the Rotax 275, 463, 473, 477, 501, 505, 535, 912 and 914 series power plants used in self-launching/sustainer and motorgliders. Recently a new V-6 liquid cooled geared 4-stroke engine producing 200hp and a turbocharged version with 300hp output has been announced for powered aircraft applications. Flight test of the turbo version is underway for the Piper PA-28. The engine comes as a Firewall Forward Package with all accessories including oil tank and radiator plus engine mounts installed. A unique Engine Management System (EMS) allows single lever control of manifold pressure, ambient pressure, engine speed and throttle position. The EMS is further enhanced with a dual-lane engine control unit (ECU) which permits maintenance facilities to troubleshoot engine problems via an on board diagnostic system much the same as found in modern automobile engine diagnostic systems. This power plant will compete with the Continental and Lycoming engines traditionally installed in most General Aviation aircraft.

Sources: Flying Magazine and AOPA Pilot Aug 2003



Rick and Rita Edris have added Private Single-Engine Ratings to their pilot's certificates with the acquisition of a 180hp RV-6 now stationed at Renton WA. It took four months study and flight training and they did all the flight training in their new ship. The Edris air fleet now includes the RV-6, a DG-808B and a PIK-20. Rita seen above in the new bird.



The 18-meter LS-8t shown here in flight is the first turbo produced by LS Flugzeugbau. It is powered by a 28hp SOLO 2350.

DG Takes Over LS

DG and LS have joined forces under the leadership of DG. This will not affect the existing base of approximately 3,000 LS customers worldwide. They will continue receiving original spare parts and high quality service out of the DG factory in Bruchsal.

The production of LS sailplanes will continue, in particular the LS8 in all current variants. Also, flight testing and certification of the new LS10 will continue. Further, DG guarantees to honor all existing down payments and options on new LS airplanes orders. Some key LS employees will join the team of DG to continue the care of the LS product family and to stay in close contact with its customer base. This cooperation will protect the investment of current LS aircraft owners. More details and updates can be found at our website: <http://www.dg-flugzeugbau.com>

This news release from Karl-Friedrich Weber, President of DG Flugzeugbau GmbH

First CARAT Arrives in the USA



AMS Flight U.S. Dealer Oliver Dyer-Bennet taxis out for a test flight in the first Carat Motor Glider delivered to the USA at the Minden-Tahoe Airport in late August. The lucky owner is ASA member Joachim Stuart of Rancho Palos Verdes, CA. Striped in Red, Blue and Orange the sprightly 15-meter ship was put through the paces in both the engined and glider modes. Interested onlookers included several pilots who were waiting for their Carats to arrive. Oliver provided hands on cockpit checkouts for these pilots as well as describing flight characteristics gleaned from several test flights. *Editors Notes: The overall fit and finish of this ship is first-class with minute attention to detail. A Pilot's Report will follow in Jan-Feb 04 Issue of APS NEWS.*

IEIHAL DISTRACTIONS!

Submitted by Bob Duncan, Portland, Oregon
<N6TU@comcast.net>

We lost a pilot (Scott Richmond) who had recently acquired an ASW-24E in an accident that would appear to have been the result of fuel starvation. Scott had no previous power time and about 200 flights in gliders. Apparently he attempted to re-start (pull starter) during climb out after takeoff as porpoising was observed prior to the stall/spin. As a motor glider pilot myself (DG-400), it brings home that one must forget the engine and fly the aircraft to the ground in an emergency at this low of altitude.

Editor's Note: Below are portions of an article by Dave Wiley covering this event. I take exception with Mr. Wiley's assertion that Scott could have returned to the runway safely after a 180 degree turn at 300ft agl. due to the drag of the extended engine and low experience level of pilot.

"To lose control of an aircraft you must be ill, disoriented or distracted. All diminish your Situational Awareness. All accidents have a chain of events. Here is one for a typical low altitude stall spin. First there is a distraction. Then the aircraft acquires a bad attitude. Pitch, yaw or both. If you ignore this, increased drag causes a decrease in airspeed. Things get quiet. Ignore this and the aircraft starts to complain. Things get noisy again like stall warning horn, buffeting and controls get sloppy. Ignore this incoming information and a stall will occur. If the stall occurs in a bad yaw attitude it will be followed by a spin. I doubt anyone can ignore a stall but if it occurs at a low altitude there may be little you can do about it.

I first met Scott Richmond after his first Glider crash, which was a hard but controlled landing on his second ride in a Glider. Scott was Gung-ho about everything he did. Wind Surfing, Snow-boarding and now soaring. He went on to get his private Glider license and was about to apply for a commercial. He had built up his experience and skills by flying different Gliders in different places. He entered contests, qualified for Badges and took training where ever he could. My last experience with him was doing auto tows at the Alvord Dessert. He flew every day he could but malfunctioning tow planes or lack of tow pilots often kept him on the ground. To solve this problem he bought an experimental Self-Launch Sailplane. He tried to do it right. He took training in a two place powered sailplane and got the endorsement. He sought advice from everyone he could find who had this type of experience and he went out and practiced.

This Motor Glider had a small (24hp) single cylinder two cycle engine that was started by a pull cable in the cockpit. He had practiced in-flight starts at a safe altitude. With a two-cycle engine it is one thing to shut it off and start it again and often quite different to get it started after it quits. Like with fuel problems. On his last practice flight the engine apparently quit at about 300 + feet altitude after take off. He turned back toward the airport. The plane then was observed doing pitch oscillations, PIO? It then stalled and spun into a pear orchard. It is assumed that he lost it while trying to re-start the engine with the cockpit pull cable.

Continued on Page 6.....

Pilot Profile

Jim Gray took delivery of a DG-400 this year and operated out of the Minden-Tahoe Airport during his checkout phase until July. He now bases the ship at the Hemet-Ryan airport, the nearest field to his home in Westminster, CA. He received his checkout ride from Tupper Robinson in the DG-500. The 400 is his first sailplane owned.



He has logged 147 soaring hours in various gliders including: S.G.S. 2-33, 1-26, Blanik L-13, Pilatus B-4, Grob 102 and 109 and DG-500 and as of this writing 7 hours in his DG-400. His most memorable flight was the first flight in the 400. Jim is an independent inspector of steel structures used in building projects in Southern California. He states the reason for flying a self-launcher is "To get away from someone else's schedule" He is a member of Lake Elsinore Soaring Club at Skylark Airport, CA. *Editor's Note: Jim encountered and solved several maintenance hurdles in preparing to fly his DG-400. His story starts below*

The Learning Curve

By Jim Gray

No far flung flight story here, just a short recap of my beginners travails of getting checked out in, and learning to operate my DG 400. Two years of club flying got me a license, and gave me ample time to really decide that a retractable was the direction I wanted to go in. The 400 seemed an easy decision with its performance/price curve, not having the means to go with a 26E, 800, or 2CM (I wish!). In early June I trailered to Minden from Hemet Ca. and met Tupper Robinson for my motor glider checkout.

Prior to self-launching I took 2 tows to check things out, as the only other ?performance? gliders I had flown were a Pilatus B4 and a Grob 102. I also had practiced engine/taxi ops. and began to see the CRITICAL nuances of proper choke use SERIOUSLY required for the aspiring 400 pilot (an upside down pumper corroborated engine is going to have its quirks). My motor is jetted for lower altitude fields, but man o' man was I ever on the learning curve for choke use! A liquid-lock and a number of flood-outs had me cleaning/changing plugs faster than any man in the west. Flying with Tupper in his DG went excellent and gave me a good confidence boost as my actual sailplane experience (beyond intermediate craft) was fairly limited to that point. I felt the step up to the 400, motor glider much less, was a pretty big one for me, to say the least.

My first self-launch flight went smoothly and included 5 retract-extend-start cycles. When I taxied back over to my trailer and got out my huge grin quickly turned to horror upon seeing my entire fuselage covered in gas from the prop back, and sloshing gas in the bay floor, while visions of flying Roman candles danced in my head.

Continued on page 7.....

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Alisport A302efi Engine Continued from Page 2.....

Besides the fuel injection, key features of the A300efi and A302efi engines are the external counterbalance shaft (large-bore single-cylinder engines can benefit greatly from this enhancement), intake port at the bottom of the engine case (results in narrowest possible width of power plant), oversize starter (allows for the starter to be used to bump the propeller back to the 6 o'clock position after shutdown and prior to retraction), and crankcase mounting points suited to integration within a retractable pylon frame.

Q. Was the Zanzottera engine initial application for motorcycles?

A. No, the MZ engines were initially developed for ultralights and trikes. Zanzottera then expanded into autonomous and remotely guided military aircraft engines and the manufacture of the MZ engines was moved to Canada where it was ultimately sold to CRE. Zanzottera now focuses on the military business and some contract component manufacturing. Two speculative thoughts on why some pilots might link Zanzottera with motorcycles: (1) there is a European motorcycle manufacturer called MZ and (2) some component manufacturers produce parts for motorcycle customers as well aviation customers (example: connecting rod forgings may be produced by the same OEM).

As mentioned above, there is a new Alisport engine (A302efi) for the Silent-IN. The changes in the new engine are evolutionary and, at first glance, it may look identical to its predecessor, the A300efi. The bore and stroke, fuel system components, and rated power are the same. The A302efi has engine case halves that separate at the horizontal plane (on the crank centerline). This allows for easier disassembly during overhaul. The case on the A300efi parts in the vertical plane (same as the connecting rod plane) and the crank bearings are pressed into each case half. The A302efi crank is new with tapered shaft ends both for the drive pulley and flywheel. The flywheel mounting system and ignition timing pickup are also new. The combustion chamber and piston ring geometries are different for improved efficiency. Lastly, although not part directly of the engine, the driven pulley diameter has been increased slightly and the propeller tip geometry has been changed, to lower tip speed and reduce noise.

Q: *What is the T.B.O. for the engine and do you produce this engine? What about spare parts?*

A: The engine TBO rating is 300 hours which is conservative for modern two-stroke engines using the latest in material technology. The highest time engine in service has over 200 hours. The engine is assembled in-house by Alisport using mostly stock parts that are common with the MZ engine produced both in Italy and in Canada (CRE). The Silent-IN power plant package was engineered in partnership with MZ specifically for the self-launch application and therefore it does have a few unique and proprietary features specific to integration with the engine pylon (for example an external counterbalance shaft). The fuel-injection system is comprised of mostly off-the-shelf Bosch™ components. Parts are therefore readily available from a variety of sources. The fuel-injection addresses the issue of carburetors leaking fuel when the pylon is lowered into the engine bay. Not to overlook the easier starting, elimination of mixture control, choke, etc. *For More Information Contact Leo at <info1@alisport.com> or call 931-224-8343*

LETHAL DISTRACTIONS...continued from page 5

Many Glider instructors are advocates of the 200 foot rule (Knauff) but not the author. That is if the tow breaks above 200 feet you can make it back to the airport. This is based on the assumption that the rate of climb on take-off is more than 200 FPM, the minimum descent rate of most gliders is less than 200FPM and it takes less than one minute to do a 270 deg. turn. In the early days I had the release pulled on me a few times and I always made it. But I didn't believe in it as a standard. When I became an examiner I figured out how to get the instructors to knock off teaching this B.S. During the first take off the candidate would call out "200 feet" I'd ask "What's 200 feet" they'd say "That means I can make it back to the airport" BANG. "Show Me!" After a few land-outs and some hairy returns the word got around. Nobody calls out "200 Feet" anymore.

Scott's self launch engine quit at approx. 300 + feet AGL. If he had just treated it as a rope break and flown the glider as he was trained to do he likely would have made it back to the airport. In both of the above cases engine failure appears to be due to fuel mismanagement. The loss of control was likely due to desperately trying to get it started again.

The lessons to be learned are ---

- (1) Don't let anything distract you from flying the aircraft.
- (2) If a return to earth is inevitable, direct the aircraft to the softest spot you can find.
- (3) Continue to control the aircraft until it is completely stopped."

Dave Wiley, DE

FLYING THE TST-10M "ATLAS"

by Test Pilot Pavel Stanek



CANOPY/COCKPIT: Good optical quality of the smoke tinged canopy, easy opening and seating. Comfortable and spacious cockpit; all controls and instruments are easily accessible and readable.

TAXIING: Rudder is effective enough for any change of direction. Originally rather softer shock absorbers of the main wheel have been substituted by stronger ones.

Continued on Page 7....

TST-10M Continued from Page 6.....

TAKE OFF: Easy to maintain direction, even in cross winds up to 6 m/sec as tested. The take-off run is 492-656ft. The climb rate under full throttle exceeds 590fpm. Noise level is not high, particularly after the engine rpm are reduced below 6,000 rpm. Flight characteristics under power are normal, without any troubles. Maneuverability is good.

RETRACTING THE ENGINE: Very comfortable. The electronic system takes care of it. Stop the engine and push the DOWN button (it opens the engine doors and extends the prop stopper). Wait until the wind mill slowly turns the propeller which is stopped in vertical position by a plastic flap of the prop stopper. Then verify the prop position in the mirror and push the DOWN button again. The engine retracts into the fuselage and the doors close. All this takes (including a period for cooling the engine and its exhaust manifold) less than 1 minute.

FLIGHT: After engine retraction the aircraft becomes a pure sailplane, comparable with any other 15M standard gliders. The L/D and sink rate correspond with what has been designed and calculated. 45 degrees bank to bank turns takes approximately 3 seconds. All speed ranges between stall speed (39mph) and 124mph (12.4mph over Vne) have been tested with no problems. At stall speed, a spin can be easily recovered in its initial phase by dropping the nose. When circling, the ship "tracks well" (no need for special controlling). Aerodynamic noise is pleasantly low.

IN-FLIGHT ENGINE EXTRACTION: The start of the engine is even more easier than the retraction. Push the UP button and the electronics does everything in some 25 sec. The pilot then turns the Starter Key. During the extraction, he may pump a little fuel into the carbs using the primer pump.

APPROACH & LANDING: Both air brakes and slips are effective, flaring normal, after-touch ground run is no problem. Landing was tested both with extracted and retracted engine - both found to be normal. Also I did a couple of touch-and-go landings with running engine. Due to the steerable tail wheel, ground maneuvering is simple and effective. *Editor's Notes: This article submitted by Zbynek Jaros after an interview with test pilot Pavel Stanek who flew the TeST-built TST-10M motor glider. For more information contact Zbynek at <jaros@info.cz>*

ASA President's Message

ASA has made arrangements with the Atlanta 2004 SSA Convention Planners to be held Feb 4-7, 2004. As it stands now we look forward to having the ASA Breakfast, Sat. Feb. 4 at 7:30 am. At this breakfast we will honor Wilhelm Dirks for his contributions to the development of the motorized sailplanes. ASA has also scheduled two speaker programs: The 1st will be by Wilhelm Dirks concerning the design and development of the "NOAH" cockpit escape system. 2nd. we will have an opportunity to listen to Friedel Weber, President of DG, who will discuss events at DG about the recent acquisition of the LS Sailplane Line and the powered Silent single-seater Ultralight. These are but a few of the many things that will be taking place at the '04 Convention. ASA will also be celebrating its 16th anniversary since being founded at the 1988 Atlanta SSA Convention. Start planning now to attend this landmark event.

Skip Atwell, ASA Pres.

Learning Curve Continued from page 5

A little trouble-shooting found the return fuel line brass nipple (still firmly attached to the hose) had come out of the rear carb body allowing fuel to pump freely onto the desert and into my engine bay when the ignition was on. The same thing had happened to one of the supply lines during an engine run when I was contemplating the purchase, so I knew it could be fixed relatively easily. Tupper agreed, told me to chill, and fixed it for me the next morning. I now check these 4 nipples CAREFULLY pre/post flight and keep a watchful eye on my fuel consumption (I never noticed the fuel go from 22 L to 6L with only one launch and 5 short runs). The next 3 days were a mix of fun flight learning, and frustrating engine learning relating to knowing when to touch.....and when not to even look.....at the choke. My next trip to Minden will include a set of high-altitude jets, and a wee bit o' tech time from Billy Stowers on low speed idle adjustment

I pulled out of Minden with greasy hands, a fear of my choke lever, and a big smile on my face; I was determined to become one with my upside down chainsaw motor. I also now had the fastest plug change reflexes on the planet, and a good starting knowledge base on my Tillotson carb./fuel system. Some ignition niggles also seemed lurking on the horizon, so I did a lot of listening to Pete Williams on troubleshooting this area. In retrospect, it was probably good that I got a solid dose of the "motorhead" bad stuff that week, because it definitely helped prepare me for dealing with these issues on my own at home.

Upon my return to Hemet California the ignition niggles surfaced, and after some troubleshooting and cleaning up of the wiring between the trigger coils and the ignition boxes it was found that the fwd. box was shot. I now have what was probably the last new Polar Fire box in the US, if not the world, according to O.D.B. of DG-USA. After installing and saying a little prayer I fired her up and found her running like an angry young chainsaw. I've been flying more than wrenching, lately, and life is good, but the learning curve continues. To all 400 owners out there: please pay very close attention to the security of the brass nipples where they press fit into the carb. body (Tillotson carb.), they will come out and it is not good.

To anyone contemplating entry into this type of soaring: be prepared for a much bigger learning curve than that required for pure sailplanes, and the curve is not all centered on flying. Proceed slowly and methodically; there are many different skills to acquire, and they can't be had rapidly. Avail yourself to as much information as you can find on your bird, and if your lucky you can find someone operating your type of craft to mentor you along. Is it worth it? So far, absolutely, and the more I learn the more possibilities I see with self-launch freedom. Huge thanks to Tupper Robinson for checking me out and going "above and beyond" with time and effort to help me mechanically, Pete Williams for mentoring me along and providing large amounts of info. on the DG 400, the Minden motorgliding crew and Tom and Billy Stowers for patiently listening to me whine and keeping me fired up.

Jim Gray

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, 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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CLASSIFIED

FOR SALE....DG-800B

1996, 500hrs TTAF, 50hrs TTE. Fully Instrumented with GPS and 02 system. 50hp MidWest Engine. 15 & 18 Meter Wing Tips. Engine and gel coat in excellent condition. Cobra Trailer. \$115,000.

Ed Shilen 903-887-9720 (TX)

FOR SALE//PIK-20E

1979 454hrs TTAF Rotax 501 Oxygen
Factory Trailer, Parachute \$38,000
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