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Auxiliary-powered Sailplane Association

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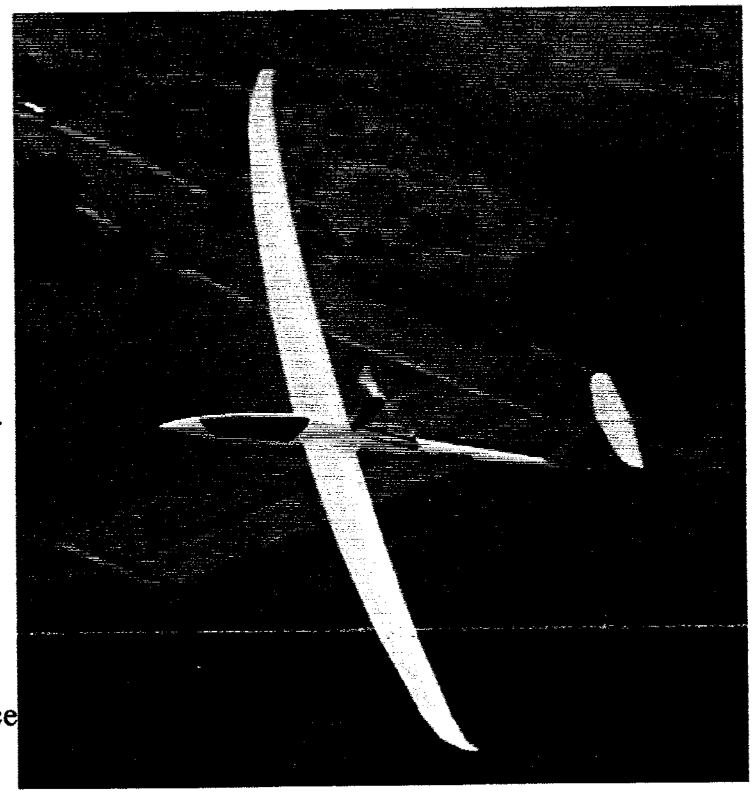
NIMBUS 4DM FLYING IN EUROPE



The Nimbus 4DM - DT became available in the summer of '1994' superseding the very successful Nimbus 3DM. A two fold design concept led to the final result. First, to apply the handling and performance characteristics of of the then existing single seat Nimbus 4, and second, to offer the advantages of an engine remaining inside the fuselage to decrease noise emissions and increase powered performance with the airflow resulting in a net gain in thrust. The engine now available is the SOLO type 2625-02 providing 65 HP which may result in slight improvement in performance after tests have been completed. The take off run of the Nimbus 4DM is shorter than both the Nimbus 3DM and the Single seat Nimbus 4M.

A substantial reduction in noise has been accomplished by the dampening effect of the walls of the engine compartment and the shell of the fuselage. In addition, the hollow propeller pylon in which the drive belt is routed, an air intake silencer and the upward pointing of the muffler contribute to total noise emissions less then the limits imposed by authorities. The Nimbus 4DM is designed to be predominately flown in the sailplane configuration and not as a 'touring aircraft'. Its propulsion system is principally designed for a powerful take off and climb.

The extension and retraction of the propeller pylon with the engine water-cooling radiator attached is by means of an electrical spindle drive. In powered flight the doors of the engine, which feature a heat reflecting foil coating, remain open to cool the engine and its muffler. The powerplant

Schempp-Hirth had a very successful design with a buried engine prior to the Nimbus 4DM, the Discus bM. I had the opportunity to fly the first Discus bM at the factory airfield at Hahnweide in 1992. At that time I owned and flew a Ventus CM. The climb performance of the Discus bM was nearly twice the rate of the Ventus CM and the noise was less even from the cockpit. Obviously, the buried engine was the way to go.

The powerplant offered in the first series of Nimbus 4DM's was the liquid cooled 59 HP Rotax model '535C'. The engine was used in the Janus CM and Nimbus 3DM. With the engine located in the fuselage, only the propeller and pylon is exposed for launch. The propeller is an aerodynamically efficient wide chord design by TECHNOFLUG AND W. BINDER. In addition, the mass of the engine is not located behind the propeller to interfere is controlled and monitored by means of an ILEC multi-function control unit which is also available as an option for the rear cockpit as well. It continuously displays not only engine RPM and coolant temperature, but also indicates incorrect procedures. Also the unit shows battery voltage, low fuel level and whether the pylon is fully extended or retracted. In the case of a failure of the pylon control, an emergency system is provided which overrides the electronic boxes and limit switches in order to retract the engine.

Electrical power for the power plant system is provided by a 12 Volt, 24 amp hour battery which is charged by the engine generator in flight, Space for additional batteries is available for avionics power. A ground service receptacle is available upon request.

A nose towing hook is fitted as standard so that the Nimbus 4DM may be operated with its engine removed. A belly hook can be fitted as an option. Both methods of launching, by aero tow or winch, are approved with the engine in place and the aircraft fully loaded.

The powerplant system is designed such that the engine can be quickly removed or reinstalled. This is ensured by using a number of quick-disconnect couplings for the electrical and fuel system and by easily accessible engine suspension points.

There are more than forty(40) Nimbus 4D's and twenty-six(26) of them are self-launchers flying all over the world(United States, Europe, Australia, South Africa, Japan, etc.) About one Nimbus 4D/DM is built per month with a rising interest for this ship. Many thanks to Tilo Holighaus for the above information.

FLYING THE NIMBUS 4DM
BY WILLIAM S. IVANS

After a year's ownership and about 80 hours of flying this big bird, plus 30 flown by son Dennis, I can offer these comments:

1. I am still impressed by just how flat it glides, even at 120 knots or better. And by how well it climbs. And by how very pleasant it is to fly!

2. The Nimbus 4DM wants a lot of rudder when entering or leaving turns; fortunately, ample rudder is available. It will circle nicely at an airspeed of 50 knots or so, but only in relatively smooth air. In rough thermals, an airspeed of 60 knots seems about right. It has a really solid, stable feel whether running or maneuvering.

3. Dive brakes are effective, and show no tendency to change position when partially deployed. At full dive brake, the flaps take an additional positive deflection, and the hydraulic disc wheel brake is actuated as well. This last movement can lead to an unplanned forward pitch upon touching down, and possible contact with the small nose wheel. The wheel brake can also be actuated by a lever mounted on the stick; it's convenient to have a choice.

4. Approach and landing are straight forward, with excellent glide path control and good visibility. The Nimbus 4DM likes to touch down with both wheels at once, but will make nice main gear only landings if called upon. Positive flap is used on approach.

5. Negative flap is used as soon as the landing roll is established, giving enhanced aileron control as well as keeping the fixed tail wheel firmly on the runway. Turning off the runway with negative flap is aided by using forward stick to lighten the tail, perhaps supplemented by a touch of wheel brake.

6. Self-launching and powered flight use the Rotax 535C engine, cleverly mounted at the base of an electrically retractable pylon, with belt drive to the one piece, fixed pitch propeller. Ignition and pylon controls are concentrated in dual panel mounted ILEC units, with lots of indicators, connections to limit switches and interlocks. Dual throttle and fuel shutoff valves are located on cockpit sides. About 50 liters of fuel can be carried, in wing and fuselage tanks.

7. A wing runner is required for taxi and takeoff. Most positioning is carried out using a tail dolly, which is removed just before takeoff. The engine is a great help, making it easy to taxi to the takeoff point in short order, especially at Minden when Mike or Tom is running the wingtip while riding a bicycle!

8. Takeoff at Minden is normally from the runway intersection, and with both seats filled involves a run of 1500 to 1800 feet until liftoff, with 2000 or more feet of runway still ahead.

9. Takeoff run begins with full back stick and gradual throttle advance, to avoid pitching forward onto the nose wheel. Negative flap is used at the beginning of the takeoff roll, giving good aileron response. As speed builds, this is gradually changed to the positive climbing flap position . The Nimbus 4DM will lift off from the full back stick rolling position at airspeeds in the mid 40's. Recommended climb speed is 51 knots indicated.

10. Climb to 3000 ft. agl usually takes from 8 to 10 minutes (Minden field elevation level is 4720 ft.). Full throttle yields 7100 rpm at 51 knots. 'Do not exceed' engine speed is 7200 rpm, with a red line on the ILEC as a reminder. The liquid cooled Rotax stays well inside its temperature limits; coolant temperature and engine rpm are continuously displayed by the ILECS. The climb uses about 4 liters of fuel, duly reported by the ILECS.

11. Cockpit noise is considerable during engine run; and headsets are available if communication is imperative. External noise is quite minimal, even at close range. This is due in part to the 3:1 ratio of engine to propeller rpm, and to a very effective muffler.

12. The Nimbus 4DM is comfortable and easy to fly from either the front or rear cockpit. A switch in the front cockpit selects front or rear cockpit engine control. The

propeller stop handle is in the front cockpit only, as are the landing gear locking slots; a swiveling handle in the rear cockpit permits that occupant to help in raising the somewhat heavy landing gear. Rigging and derigging are simple and straightforward, due in no small measure to the automatic hookup of controls.

13. Fuelling is a rather slow process, as the (optional) internal fuelling pump has a low rate of flow, and several fuel line connections must be made in turn. Some care must be taken to avoid spillage when using the quick disconnects in the fuel lines.

EMERGENCY LOCATOR TRANSMITTERS HOW GOOD ARE THEY?

There has been an ongoing discussion in the soaring community concerning the pros and cons of carrying Emergency Locator Transmitters aboard sailplanes. Some of the arguments have been based on cost and some on performance. I would like to address the performance aspect of carrying an ELT and what it can really do for the soaring pilot who has landed out with damage and possible injury in remote terrain.

Most sailplane flying in the United States is done under FAA Part 91 VFR Flight Rules, with no Flight Plan filed, and sometimes over remote terrain where a landing may not be observed and the location difficult to reach by roads. Even when a ship lands only several miles from the soaring site it can be very difficult to see. Landing in a forest on a ridge leaves practically no trace of the ship, which can not be seen except from directly above. Can an ELT provide the information necessary to rescue the pilot that day? Maybe yes, maybe no. Having an ELT on board is probably better than not having one. The warm fuzzy feeling that you get by knowing you have an ELT installed and a quick rescue is in the offing in the event of a damaging landout, may not be borne out when examining how effective the ELT is in the real world.

Emergency Locator Transmitters became mandatory in the 1970's by congressional action. Since then a database has been developed which shows the operational history of ELT's. This data shows that the ELT's operate properly in a crash situation less then twenty-five percent of the time. The ELT's may have been destroyed on impact, the antenna may have been broken, wiring and cables cut, the impact switch may have failed or the batteries were weak. Of the several thousand ELT signals received by Search and Rescue Satellites (SARSATS) each year, less than three percent are the real thing and the rest are false signals. In a crash situation where the ELT operates properly, it could be several hours before a rescue attempt could be made. Once one of the seven polar orbiting SARSATS makes two passes over your transmitting ELT, which takes up to three hours, a telephone search begins which includes Air Traffic Control asking aircraft in the vicinity if they hear an ELT signal on 121.5. On average, the Civil Air Patrol is sent two hours after the ELT signal is processed and determined to be legitimate. The CAP may have to search an area larger than twenty square miles in order to find the aircraft because of the lack of accuracy of the 121.5 Mhz signals. The newer generation of ELT can cost more than $2500.00 but can be registered with the pilot's name and type of aircraft, telephone number and address. An even newer ELT not on the market yet will be GPS based which will reduce the search area even more. The aircraft will probably not be found on the first day if the crash happens in the afternoon as in the case of most soaring incidents. There are notable cases of aircraft with functioning ELT's never being located at all in the United States.

A soaring pilot can hedge his bets for rescue the first day by carrying a hand held radio, a cell phone, a hand held GPS, high quality flares that fire high above the sailplane, and a signal mirror. Finding a place in the glider for this equipment can be difficult if not impossible. You must chose what works for you. Let me relate a rescue operation to you that I was involved in two years ago.

A pilot had gone down in the mountains and was equipped with a GPS in his glider, a handheld radio and flares that could be fired overhead. After landing he relayed his coordinates to a glider who relayed them to the Competition Director. The time was about 3 P.M. The rescue party set out about 4 P.M. equipped with a handheld GPS, a VHF radio, a cell phone and a map with a dot placed on it at the exact coordinates given by the Competition Director. We drove about 20 miles to get close to the dot on the map. We could not find the glider. We climbed a hill and were able to talk to the pilot on VHF 123.3 The pilot fired a flare which the party saw about 4 miles away We advanced toward that position as best as we could on dirt roads, still not finding the glider. Again we climbed a hill and the pilot fired another flare that took us closer to the glider and then we saw the wing of the glider about one-half mile off the road. We hiked in to find the pilot injured. I attempted to contact someone on 123.3 but by that time the fleet had landed. It was now 6 P.M. I tried my cell phone not believing it would work, but it did. I was able to talk to the CD by cell phone and tell him the situation and order a helicopter. When the helicopter came in view it flew by us about 3 miles south. I could not contact him on VHF so again called the CD on the cell phone and asked him to relay to the helicopter to call us on 121.5 or 123.3. To my amazement the helicopter crew called me on my cell phone and I was able to ask them to come up on VHF 123.3. The helicopter couldn't find us in the diminishing light so I vectored him to us and a landing. The pilot was flown out to the hospital to fly another day. It was soon dark and it was soon cold.

My conclusion is that the pilot most certainly would have spent the night on the mountain had he not had flares. If you aren't able to walk after a crash, you must have survival gear on board. With an ELT aboard and no flares, the pilot in this case, would not have been rescued the same day. If you are a glider crew member and your pilot is down with possible injuries, as in this case when the pilot actually reported his position, you can call the **AIR FORCE RESCUE COORDINATION CENTER directly at 1-800-851-3051.** You can report your pilots coordinates to the rescue center and give other details which will help them initiate a search. This may reduce the time that rescue can begin. If the pilot has an ELT on board the call will eliminate the question of a false signal.

Stan Nelson

1998 Velocity Index Handicap
Auxiliary-powered Sailplanes

The basis for the derivation of velocity factors (k1) for the following list of auxiliary-powered sailplanes is the performance capabilities of a datum glider. The DG-400 was selected because of its known performance record after many years of competition and the amount of data available. The DG 400/17 Velocity Index Factors equals 1.000. All other auxiliary-powered sailplanes have factors greater or less than this value.

The purpose for creating factors for competition in this class is "TO ENCOURAGE PARTICIPATION" in soaring contests by pilots who will have a fair chance to compete and do well despite the type of glider flown. Theoretically, this enables the scoring system to better measure pilot skill. As you know, this is a very difficult process because of the many variables. The factors are not perfect because the data is not perfect due to the wide range of pilot skill that creeps into any analysis of glider performance in a contest. The competition record of a particular glider may be more influenced by the skill of the pilot than the performance of the glider. The factors that you see here are a derivation of the relationships found in the excellent work of Bud Schurmeier, Oliver Dyer-Bennet, the British Gliding Association and the author, Stan Nelson.

The basis for the factors are manufacturers data, L/D, polar, minimum sink, all up weight vs. maximum gross weight(wing loading range), wing span, winglets, competition data and a soaring contest average rate of climb of 2.0 - 3.0 knots. Shorter winged gliders(15 to 18 meter) benefit by increased span by approximately 2-3% per meter in L/D and by winglets approximately ½ - 1%. Longer winged gliders benefit less by increased span and winglets on a percentage basis. A narrow wing loading range incurs a reduction in overall performance. Some auxiliary-powered sailplanes are at their maximum gross weight allowable with no water onboard and therefore have no wing loading range at all. Cross-country speeds are a function of average climb rate among other factors. *On stronger days the time spent climbing decreases, cross-country average speeds increase and the shorter winged, higher wing loading gliders derive an increasing benefit.* Longer span gliders have less of a relative advantage on strong days. Of course the same effect occurs when flying extended periods on a ridge or under extended cloud streets.

The handicap K1 factors are taken out to the third decimal place to better differentiate between ships. Original handicaps were created before the predominance of winglets and allowed only 1-% differences between ships where now ½ percent differences between ships is possible. This will help to reduce the large differences in the present handicaps between ships that did not seem to be borne out in the real world of competition flying.

1998 Velocity Index Handicap

Sailplane	Span	K1 Index Factor
ASW 22/BM/WL	26.4	0.875
ASW22/BE	26.4	0.875
NIMBUS 4T	26.4	0.875
NIMBUS 4M	26.4	0.880
NIMBUS 3T	25.5	0.880
ASW 22/BE/BM	25.0	0.885
NIMBUS 3T	24.5	0.885
NIMBUS 4DT	26.4	0.890
ASH 25E	26.4	0.895
NIMBUS 4DM	26.4	0.895
ASH 25E/M/WL	25.6	0.900
NIMBUS 3T	22.9	0.900
NIMBUS 3 DT	24.6	0.905
ASH 25E/M	25.0	0.910
NIMBUS 3DM	24.6	0.915
STEMME S-10 WL	23.6	0.925
STEMME S-10	23.0	0.930
ASH 26E/WL	18.0	0.930
DG 800 A/B/WL	18.0	0.930
ASH 26E	18.0	0.940
VENTUS 2cT	18.0	0.940
LS6 CM	18.0	0.940
DG 800 A/B	18.0	0.940
VENTUS 2cM	18.0	0.940
NIMBUS 2M	20.3	0.955
DG 600 M	18.0	0.955
LS 6 CM	17.5	0.960
VENTUS CT	17.6	0.960
VENTUS CM	17.6	0.970
DG600	17.0	0.975
DG500M	22.0	0.975
VENTUS CT	16.6	0.980
VENTUS BT	16.6	0.985
JANUS CT	20.0	0.985
JANUS CM	20.0	0.990
DG400	17.0	1.000
DG800 A/B/WL	15.0	1.005
LS6 CM	15.0	1.010
VENTUS 2cT	15.0	1.010
DG800 A/B	15.0	1.010
VENTUS CT/WL	15.0	1.010
VENTUS BT/WL	15.0	1.010
VENTUS 2cM	15.0	1.010
DG600 WL	15.0	1.015
VENTUS CT	15.0	1.015
VENTUS CM/WL	15.0	1.015
DG600	15.0	1.020
VENTUS BT	15.0	1.020
VENTUS CM	15.0	1.025
DG400	15.0	1.030
ASW 24E/WL	15.0	1.045
PIK 30E	17.0	1.045
ASW24E	15.0	1.050
PIK 30E	15.0	1.055
PIK 20E	15.0	1.055
G103/IIISL	18.0	1.145
	TOURING	
XIMANGO SUPER	17.7	1.290
GROB 109B	17.4	1.310
KATANA EXTREME	16.6	1.320
TAIFUN	17.0	1.320
GROB 109A	16.6	1.330
DIMONA	16.5	1.330
VIVAT	16.8	1.380
SCHEIBE SF 28	16.28	1.380
ASK 14	14.3	1.400
MONERAI	12.0	1.420

June 22-26

1998 AUXILIARY-POWERED SAILPLANE NATIONAL CONTEST

Planning is underway to site the 1998 Auxiliary-powered Sailplane National Contest at Hobbs, New Mexico in conjunction with the Region 9 Contest held ~~July 6-10~~, 1998. It has been suggested that the Auxiliary-powered Sailplane pilots from around the country be invited to Hobbs for a 'fly-in' get together during the week prior to the contest. During this time pilots, family and crew could enjoy breakfast together followed by a short talk on 'cross country flying at Hobbs', weather, safety, etc. Pilots planning on flying the contest could show up early for practice and pass on competition tips to those planning on recreational flying only. The contest rules and handicaps have been revised to encourage greater participation. See insert of this issue for handicaps and explanation. Please contact Ed Shilen for particulars concerning the contest and 'fly in' at 972-875-1442.

NOTE FROM THE PRESIDENT

The 1998 Soaring Society of America Convention takes place February 26-28 in Portland, Oregon. There will be a safety Seminar held on February 25th and a Banquet on February 28th. The SSA General Membership Meeting will be held on February 27th.

The Auxiliary-powered Sailplane Association Breakfast will feature guest speaker Dr. Reiner Stemme. Dr. Stemme will speak on the recently certified Stemme S-10 Turbo and other developments at Stemme.

The ASA Membership Meeting will take place immediately following the Breakfast and in the same room.

A one hour panel discussion session will be scheduled for Auxiliary-powered manufacturers or their representatives to discuss the latest developments in their products and to answer questions from the audience.

An additional one hour session may be scheduled to discuss Self-launch Safety.

A tentative schedule is as follows:
Self-launch Safety Thursday February 26th AM
Aux-powered Breakfast Friday February 27th 0715
Panel Discussion Friday February 27th PM

Please check the Convention Schedule for possible changes. See you in the beautiful city of Portland in February.

DG-USA SHOP TALK BY OLIVER DYER-BENNET

PROPELLERS

From Webster's dictionary: "a device having two or more blades in a revolving hub for propelling a ship or aircraft".

Most auxiliary-powered sailplanes use wooden propellers with some composite structure built into them.

Engine torque, (horsepower), is mainly transferred by friction. Yes folks these props can fly off at full rpm. This usually results in startling results and a rapid increase in the pilot's heart rate.

A careful reading of your sailplane maintenance manual and or the propeller manufacturer manual will reveal a number of interesting tidbits.

From the Hoffmann GmbH & Co, KG, propeller owner's manual: 3.1.9 Propeller Torque:

"Check torque after the first flight, after the first 25 hours and after that as necessary, but at least 50 hours. Do not loosen the bolts, only apply the required torque. In hot and dry climate the wood may shrink, therefore closer retorque intervals have to be established". (The propeller hub may dimensionally contract).

In the DG-USA shop we recommend torquing as follows for a new propeller:

1. Retorque after first, 5-minute, full power, engine run.
2. Retorque after first hour of engine time.
3. Retorque after 5-hours of engine time.
4. Retorque at each 25-hour engine time or at each annual inspection whichever comes first.

When you are doing an annual inspection, in the DG-USA shop we will remove the propeller and inspect the back hub for signs of cracking as per the Hoffmann or MT -propeller owners' manual. (More on this in a later issue).

"DG-USA is the factory authorized service and repair facility for DG Flugzeugbau GmbH of Germany".

DG-USA
5647 Sharp Road
Calistoga, California 94515
Phone (707)942-5727 Fax (707)942-0885

CHICHO ESTRADA'S ASH 26E BEING PREPARED FOR FLIGHT

NEW SELF-LAUNCHING BOOKLET AVAILABLE

ic Greenwell has just finished a very professional and informative 18-page booklet called **SELF-LAUNCHING SAILPLANE OPERATION**. It covers all aspects of flying a self-launching retractable engine sailplane from Pre-flight to Post-flight, Emergencies, Wave Flying, Safety, Cobra Trailer notes and ASH-26E information. Copies are available at $3 USA/ $4 Canada/ $6 International each pp from ASA Publications, c/o Pete Williams, 1033 Dresslerville Rd., Gardnerville, NV 89410 USA . Please allow 1-2 weeks for delivery

FREE AS A BIRD: SELF-LAUNCHING SAILPLANES

At long last Pete Williams' book is finally going to press. A three year effort, this first-of-its-kind reference book (8.5x11" 136 pages, 220 photographs) is for anyone who wants information about buying, flying, and maintaining a modern self-launching sailplane. It contains specifications on twenty-five (25) self-launchers, a history of the development of this type of sailplane, Power Plants, Maintenance and Upkeep, Training, Organizations and Flight Safety

Reservations are now being accepted for signed copies of this book at $26.95 each plus shipping. DO NOT SEND MONEY. Just write or fax Pete Williams to establish your reservation. u will be sent an Order Form as soon as the book is printed (est. February 1998). Please address your reservations to: For The Birds Publications c/o Peter A. Williams, 1033 Dresslerville Road, Gardnerville, NV. 89410-8951 USA FAX: 702-265-6179.

ENJOY THE MOUNTAINS OF TAOS

Rick Howell is planning a fun meet at Taos, New Mexico from June 6th to June 13th. Rick has been going to Taos since 1984 and says June is the best! The ramp area has been expanded so the only limitation on participants will be tow planes. Taos provides a great site for badges, records, and fantastic fun flying in the mountains. Other activities: golf, rafting, sightseeing, hiking, fishing, shopping (Southwestern Art Galleries) and eating.

Please call Rick or his wife Pat (who keeps track of everything, including Rick) for details and put your name on the list. Phone number (972) 245-0830.

DG-400-Rotax Engine Spark Plug Performance

the last newsletter we left out some essential information ncerning Steven Drane's DG-400 #176 spark plug performance. His ship is powered by a Rotax engine and has the Bosch Polar Fire ignition system with NGK B8EV Platinum plugs and Tillotson Carbs. He has been using Aviation Low Lead 100 Octane fuel and Yamalube R Oil @ 50:1. The amazing thing is that after five years of operation with 34.75 hours of ground and flight time the plugs were only lightly covered with carbon with no indication of lead deposits. Stephen has documented 240/250 cycles during this period and only a 180-220 RPM drop on each ignition circuit @ 3000 RPM prior to the last flight. Please re-read the previous article to get the full story. Stan Nelson

ELT UPDATE

The 'Aviation Safety' journal published in its December 1997 newsletter that a Cessna 172K crashed in mountainous terrain September 25, 1997 near Sandy Valley, Nevada. The Civil Air Patrol found the aircraft nine(9) days later on October 5, 1997. The pilot was found deceased. There is not enough information in the report to determine whether the ELT worked at all or for only a short period or whether the pilot was killed on impact. The significance of the report is the difficulty finding a downed aircraft and that pilots should not assume they will be found in a matter of hours even with an ELT on board. Stan Nelson

CLASSIFIED ADS

For Sale:
DG-500M, 1994, TTAF 66, Fully loaded, Cambridge S-NAV/GPS, Dittel Radio, Intercom, Self-rigging System, Covers, Cobra Trailer, etc. Call:805.270.0788
hhtp://members.aol.com/DanMatzke/DG-500M