APS NEWS

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

Volume XXX Issue #123 **ASA Web Site: <www.motorglider.org>** **Jan - Feb '09**

Spy Plane? New Secret Bomber? Really long range fuel tanks?

In this Issue:

Don't forget to signup for Parowan 2009 forms at www.motorgliding.org

NEWS FLASH

Hot off of the Digital Presses
Self- Launch Retractable Engine Sailplanes
Pete Williams definitive book on SMG's
is now available on DVD with bonus features

President's Corner

President's Corner

Greetings to all from Texas…..where it is warm, but windy.

The planning continues for the Parowan fly-in for 2009. The current list is now 35 and we have room for just a few more motorgliders. I am also sending an e-mail to the pilots who have signed up for the event, so if you have signed up and I have not included you in a separate e-mail please let me know. A group of 35 gliders will be a good number for our fly-in. Jett Smith is working on the meal arrangements and will inform me soon of the plan.

Great Soaring !!

Rick Howell

EDITOR NEEDS HELP

Thanks to the folks at Peter Selinger, Brian Utley, Terry Emonds and Oliver Dyer-Bennet for contributing to this issue. For the rest of the readers I could really use your help with articles and photos. There's lots of flying being done and a lot of us have digital cameras so it is easy to submit photos. I am always looking for content so please contribute to the newsletter.

Looking for Hangar Mates

Jim Walsh let me know about hangar space available for self-launch gliders at the Winter Haven, FL airport. Please contact Don Pollard at 863-956-9113.

SAFETY COLUMN

Oliver Dyer-Bennet, CFI/CFIG
Safety Director ASA

Devoted to the enjoyment and safety of the sport of high performance powered sailplanes and motorgliders.

From Tom Knauff we have the following article on the Airbus A320 motorglider Hudson River landing.

Training For That Moment When
Every Second Counts
By: Val Paget / AOPA

When an emergency occurs in flight, three skills are in great demand: situational awareness, creative problem solving and energy management. One doesn't have to be flying a large aircraft with 155 people over a crowded urban environment to recognize the value of developing these skill sets.

Piloting an Airbus 320, US Airways Capt. Chesley B. "Sully" Sullemberger made a successful emergency landing on the Hudson River after the complete loss of engine power essentially turned the airliner into a giant glider. This was not his first glider landing. Along with thousands of hours as pilot in command and a career as a safety expert, the captain holds a glider rating.

A spokesman for US Airways said that it is difficult for ditching to be replicated in a flight simulator. According to media reports, a US Airways pilot who has flown the A-320, said that the chances of ditching are rare and that pilots don't routinely practice the maneuver beyond ground school.

Caught by deteriorating weather over unlandable terrain, this pilot, (the author), chose a lake as the safest landing option. Glider pilots in Sweden, where lakes and bogs are more common than farm fields, refined water landing techniques and shared them with the world. While rare, most glider pilots are confident in their abilities to land with minimal risk or damage.

Glider pilots develop a unique situational awareness. Glider instructors drill their students about landing decisions. At 2,000 feet agl. out of glide range of an airport, pick a spot that's landable. At 1,500 feet agl. commit to that spot. Glider pilots train to think outside the box. If a river is the best solution, they can immediately commit to landing there before too much altitude is lost.

US Air Force Capt. Danny Sorenson, who instructs in F-16's is a glider pilot. He stated, "As a result of my glider training, I'm always thinking, "Where can I land this thing?" He also noted that during his F-16 training, simulated flame-outs were never a problem for him, "It's instinctive," he said, "I'd just fly my pattern and glide in."

Instincts like this save precious seconds. When Sullenberger took the controls, the aircraft was a large open class glider, at 3,200 feet over New York City....*****

"to be continued next issue"

Carat in the shop at AMS-USA getting it's winter annual inspections. Tuned, polished and ready to go for the 2009 soaring season.

FROM THE DESERT BETA TEST FACILITY

TECH TALK

by Gary Evans

HIGH STRENGTH LOW TEMPERATURE BRAZING

Metal fabrication and repair is a handy knowledge for working with all things mechanical. Of course it would be easier to just purchase what you need but sometimes it isn't available or you need something unique. Often individual components must be bonded together because it would be too difficult to make the part from a single piece of metal.

Most people are familiar with low temperature soldering, which creates a low strength bond and high temperature brazing which creates a high strength bond. Many less however are familiar with silver solder which not only can be performed at relatively low temperature but creates a high strength bond that can penetrate completely through tight fitting parts. The appearance of the bonded parts is excellent without the need for extra finishing if done correctly. Silver solder works with brass, copper, steel and stainless steel.

Silver solder is comprised of fine silver (67%), copper (22%) and zinc (11%). This is the common blend but these ratios can be altered to provide specific properties and hardness for special applications. Melting temperature vary with hardness. Soft = 1325 degrees F, medium = 1390 and hard = 1425. These temperatures are beyond the heat range a propane torch can generate but a mapp gas torch (5301F max) is sufficient.

You may or may not find silver solder at hardware stores but any welding supply shop will have it. They can also help determine the best grade of silver solder for your application. While you are there pick up some silver solder flux, which will be in liquid or paste form.

Parts to be silver soldered must be perfectly clean and free of any contaminants. It is best for the parts to be tight fitting, as silver solder does not work well for filling large gaps. Try to

prevent even fingerprints on the surfaces to be bonded. All surfaces of the parts even those not to be bonded are then coated with silver solder flux. This is necessary to prevent surface oxidation that would additional cleaning.

The parts are best held together with clamps during brazing that can withstand the heat. Obviously eye protection is required for any welding procedure. The technique is to carefully heat the parts until the temperature is sufficient to melt the silver solder but no hotter which could cause the surfaces to oxidize. Silver solder will not bond to an oxidized surface. The correct temperature is best judged by the color of the area to be brazed. You will be making this judgment visually so a little learned technique is required. My best explanation is that the surface color appears to brighten slightly but the best way to learn is to try this on some scrap pieces before hand. When the correct temperature has been reached the silver solder rod is touched to the edge of the surface to be bonded without ever taking the torch flame away from the parts. If the heat is sufficient the silver solder will immediately melt and be drawn into the join. Keep heating the parts until you can see that the silver solder has been drawn completely through the joint.

The hardened flux is easy to remove by holding it under running hot water and whatever extra finishing is required can be done with mild abrasives.

Silver solder works well for small parts on all but the most demanding applications and is excellent for bonding fittings onto wire rope such as control cables where normal solder lacks the strength required.

Harris Ranch Carat Fly In

Motorglider Fans;

The 2009 Harris Ranch / Carat Fly In will be May 15, 16 & 17 at the Harris Ranch in central California.

We are timing the Carat Fly In with the Avenal glider contest, which is just down the road from the Harris Ranch. The Avenal contest runs from May 13-17.
We expect to be doing some contest flying with the boys at the Avenal contest.

This year we are opening up the Harris Ranch / Carat Fly In, to all make & models of motorgliders. So if you have the time and the desire for some good early spring gliding, good glider conversation around the pool, and good steaks at the Ranch, bring your bird by for the weekend. Note we will not have a tow plane so self-launch is the way to go.

Contact: AMSAERO@AOL.com for more information.

Oliver Dyer-Bennet

Antares DLR-H2

Does you motor go Hmmmmmmmm?

by Peter Selinger

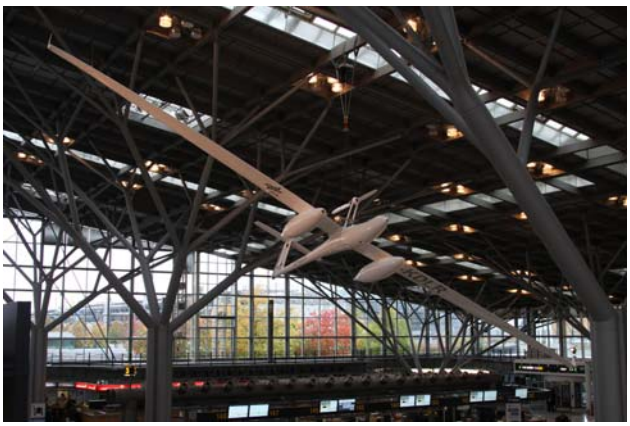
A step into a pollution free future of aviation–
The self launching fuel cell research motorglider Antares DLR-H2

When you will read these lines probably the Antares DLR-H2 will have made successfully its maiden flight, self launched! Yes, self launched by fuel cell energy (FC) only, without support by batteries. But, this special edition of the standard single seater Antares electric powered high performance motorglider of the German Lange Aviation is a true research plane, to test and evaluate the fuel cell generator for the electric energy feeding the prop-driving engine in aviation related applications. As far as known to the author, this Antares DLR-H2 will be the first man-carrying aircraft self launched (!) with FC energy only at all.

Originally created by the German non-profit working group HYFLY3000 the idea of this Antares DLR-H2 is to use a certified electric motorglider to save money for the real important parts of the project, the FC installation and operation in all its aspects. These include future general application in aviation, meaning also the useage in daily flight operations by non-specialised scientists. That’s the long-term main goal, well knowing that today the costs of installation a FC-system (against the

batteries) will be to high for a world-wide dissimination in large series. But without a wide step into future now to develop the basics, there will be no general cost effective application later.

The standard Antares will be changed mainly only for the additional structural loads produced by the two wing mounted pods, carrying the hydrogen tank and the fuel cell generator, besides the necessary additonal electronic equipment to operate the FC installation and for data collection, which also is not a trivial task. But Lange and the „German NASA“ DLR, the German Center for Aviation and Space Technology, two well suited partners came together, Lange with the experience of 50 produced Antares high performance electric motorgliders and DLR with its wide knowledge and well funded infrastructure in all fields of material, technology and process in aviation and space research. The Stuttgart facilities of the DLR combine all necessary knowledge for that project, especially FC development and competence center, thermodynamics and structure research with a focus at fiber reinforced plastics and ceramics to withstand highest stress in temperature and strength.



The FC-stack will deliver a power of 20 to 25 kW (27 to 33 hp), about half of the batteries’ performance in the series production Antares. The used FC-stack is a master piece of FC-technology application in comparison of the required volume to the power. The electric output of the FC is sufficient for self launching at paved runways, anyway necessary due to the low clearance of the pods to ground and acceptable for a research plane. But looking at this power load please remind the pioneers of the 20ies, who flew with 20 hp around the world.

It’s a pity that today only with hydrogen based FC’s there is a chance for such a project, due to its efficiency compared with other „fuels“ as methane or car fuels and its operation experience level. The handling of the hydrogen in the pressure tank creates difficult safety and security issues, which have to been solved before a first start. 300 bars (+ 4000 psi) of this high explosive stuff only 3 m away from the pilot and close to the main structure of the plane require extraordinary care. So this start for the maiden flight is one of many steps in the projects life and investigation phases have been performed before and have to be overcome successfully afterwards. But this maiden flight with FC marks an important step into this future of power plants in aviation producing pure water exhaust without any pollution, as carbonoxides a.s.o. Congratulations to Dr. Josef Kallo (PhD in engineering) and all his team members for the realization of this appreciating project Antares DLR-H2.

Let’s see, 95 gph at mach .7 or 1.7gph at mach .1 Decisions decisions.

Get a free ASA Decal.

ASA

Auxiliary-powered Sailplane Association

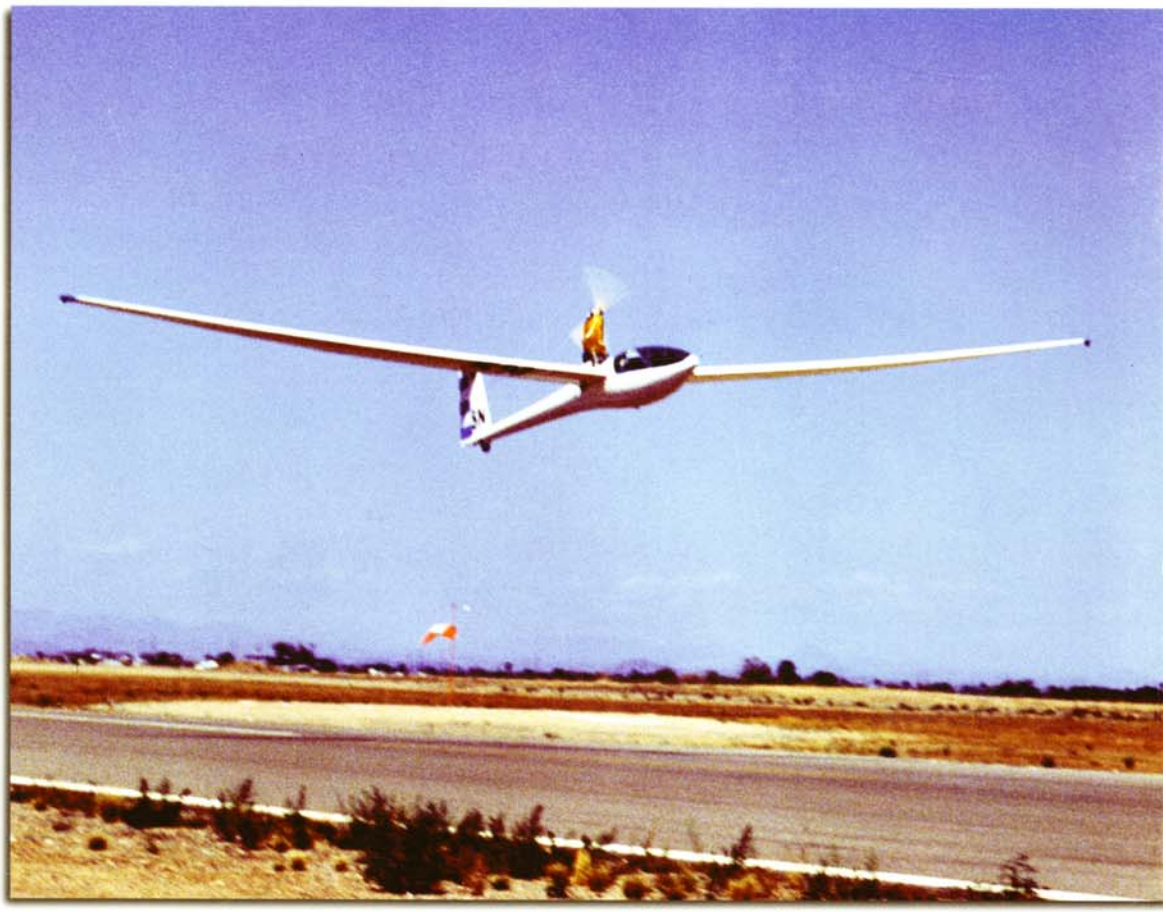
Additional Decals $1

Send a self addressed, stamped envelope with postage attached

<u>(remember the new postage rate is 42 cents)</u> to:

Brian Utley
9541 Virginia Avenue South
Bloomington, MN, 55438

Self-Launch!
Retractable Engine Sailplanes



- Development
- Buying & Flying
- Maintenance
- Makes & Models
- Power Plants
- Flight Safety

Foreword by Donald D. Engen, Current Director,
Smithsonian Institution National Air and Space Museum

Peter A. Williams

ASA with permission of Charm Williams is re-publishing Pete Williams definitive book on Self Launch Motor Gliders.

This DVD has the complete book, cover to cover, as well as an added bonus of every ASA newsletter ever printed through the fall of 2008.

You can get your copy for only $14.95 + $4.05 in postage/handling by sending a check to:

ASA - Pete Williams DVD
c/o Eric Greenwell
222 Thayer Dr
Richland, WA 99352

Also available from Cumulus Soaring.

Altitude

When it is and when it's not

by Brian Utley

Altitude, such a simple term. We all know what it means: how high something is. The dictionary reads something like this: altitude is a distance measurement, usually in the vertical or "up" direction, between a reference datum (msl for instance) and a point or object. For soaring pilots altitude is something that we dream about, seldom have enough of and at the end of a flying day we share with each other "how high did you get today?" answering with whatever our altimeter indicated.

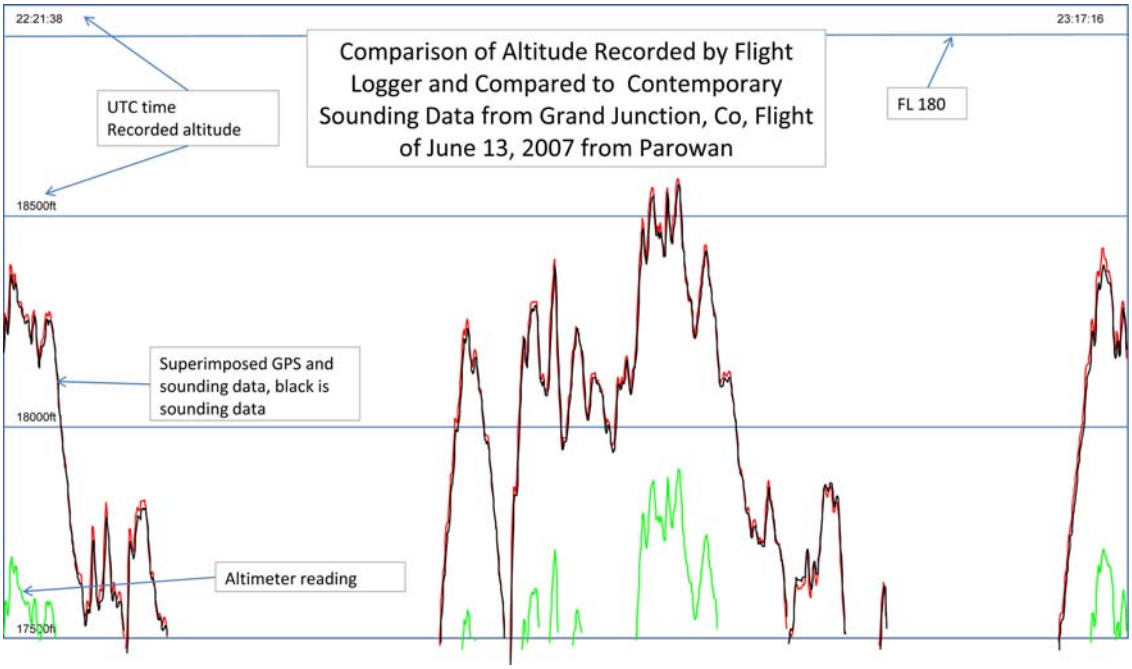
Now we know that there is much more to dealing with altitude. We deal with altimeter settings, density altitude, flight levels, airport altitude terrain clearance and controlled airspace. We set our altimeters according to the altitude of our take-off location and the little window on the face of the altimeter tells us what the atmospheric pressure is referenced to sea level. If the ground pressure changes, and we know what the new pressure is, we can adjust our altimeter so that it will give us current information relative to the local area and therefore our altitude above ground. Yes? Maybe not! This article is about what happens in the atmosphere *above* the ground that our altimeters may not know about.

I used to think that, for record purposes, we could look at the altitude recording of our barographs or data loggers and apply a calibration correction and then adjust for local pressure at the time of the flight and voila, we have proof positive of the altitude we gained in our sailplanes. I have figured dozens of these and never had a question raised about the result. After I started using a GPS data logger I noticed that there was a GPS altitude log as well as the pressure altitude log. I asked why the GPS log was not used and I was told that the IGC had decided that the GPS altitude data was just not accurate enough. Well, OK, I can live with that. Then I became involved with the National Aeronautic Association (NAA) and records took on a more serious posture. After looking at many flight logs and data from very precise instruments such as we use at the NAA I became convinced that there was more to the question than 'GPS altitude is not accurate enough'. So let's look at the question.

GPS Altitude. GPS altitude is calculated based upon the earth being an oblate spheroid of well defined proportions. Measurements are made from a minimum of 4 satellites and the altitude measured is referenced to the surface of this oblate spheroid. Unfortunately, the surface of the earth is not smooth and deviates from the theoretical shape. So there must be a correction applied. In fact we now know that mean sea level varies around the world by between +75 and -100 meters and so the correction must be made to local sea level. For the US the variation is from -8 to -53 meters. The National Geodetic Survey puts out a table of variations that can be obtained. It is built into some of the more recent GPS engines such as the Garmin engine used in the Cambridge 302 and 302A data loggers. This information can usually be obtained from the GPS engine manufacturers data sheets. The result is an absolute height measurement to within the accuracy limits of the GPS receiver. Given this then shouldn't one expect pressure altitude and GPS corrected altitude be about the same? Good question, read on.

Pressure Altitude. The ICAO has accepted as a world-wide standard a model of the atmosphere. It presumes a sea level temperature of 59 degrees F and pressure of 1013.25mb or 29.92Hg. A temperature gradient of -3.57 degrees F / 1000ft up to 36,000ft is assumed after which the temperature becomes isothermal. All barographs, recorders and altimeters are calibrated to this standard. Because the atmospheric pressure is always changing we change the setting of our altimeters by adjusting the window on the instrument. This is often referred to as the QNH setting. So far so good but what happens after we take off? The altimeter is measuring the weight of the air mass above the ground when we set it to local altitude but the rate of change of the weight (therefore pressure) as we climb is a function of the air temperature above the ground. The air temperature aloft can vary substantially with altitude compared to the standard so while we had a good reading on the ground, once we are in the air we are not able to determine how much temperature induced change we are being subjected to. The altimeter *assumes* that it is following a standard rate of change. While this is not unexpected, I was quite surprised to discover that this may result in readings that are *hundreds of feet* different from what our instrumentation is telling us! Not much of a problem as long as we are all flying in the same air mass. The error though does become significant when flying over areas like the Great Basin and Parowan as I will show you. The question is: how do we know what is going on in the air? For years we have been using sounding data to forecast soaring conditions, looking for temperature gradients that will support thermals, well, this same data can also tell us what to expect or what we have experienced, we just have to look for it and use it. The University of Wyoming has an archive of sounding data that

goes back for years. We can retrieve the data over the internet and analyze it to our hearts content. Every day, at the same time, twice a day, sounding stations around the world send up Radiosonde balloons that record temperature and geometric altitude up to about 60,000ft. I use this information to make forecasts for the current day as well as analyze data from flight logs. For Parowan, I use Grand Junction, Colorado, Salt Lake City and Las Vegas as sources of sounding data. During the summer the upper air is surprisingly consistent across the whole area unless there are fronts or thunderstorms that impact on local conditions. As an example, below I have used one of my flights from 2007 at Parowan. The graph starts at 17,500ft to better illustrate my point. The green line is the altimeter reading derived from the flight log, the red line is the GPS log trace and the black line is the result of applying the sounding data to the flight log.



Notice that the GPS and sounding data have excellent correlation and show about 700ft higher altitude at the peak than the altimeter! Even though the altimeter never goes above 17,900 the *real altitude* is above 18,000ft and it raises the question of Flight Level 180 and controlled airspace. The answer is FL 180 is based upon an altimeter setting of 29.92Hg which gives a real altitude of 18,936ft under these conditions. The Grand Junction and Salt Lake soundings take place at 6:00am local time, this gives enough time to check the sounding and determine what the altimeter error will be on that day. For those of you who will be at Parowan and wish to become more familiar with this we can spend some time going over the analysis process.

As a side note, just using the standard technique for measuring altitude performance the low to high altitude gain of this flight was 2,997 meters, just under Gold altitude gain whereas the *actual gain* was 3,149 meters. Also, I have observed that the pressure sensors in some flight recorders have rather long response times. For unpowered sailplanes it means that care must be taken to lose enough altitude and take enough time to mark the barograph so the barograph will clearly respond, this may also happen if the logging interval is set too long. I have seen a number of flights where it is almost impossible to determine when the tow release took place. Of course, with motorgliders the barograph trace provides the engine shut down time.
Flight statistics for the example flight:

Data Logger Serial #: CAM3VT
DATE: 6/13/07
PILOT:Brian G. Utley
GLIDERTYPE:DG 800B
Parowan altitude 5930ft, 1807 meters
Altimeter setting 1022.67mb, 30.2Hg
Start time 18:34:29 UTC
Recorded takeoff altitude 1725 meters, GPS alt 1813

End time 23:57:48 UTC
Recorded landing altitude 1757 meters, GPS alt 1811
Engine started at 18:34:33 UTC
Engine stopped at 18:40:10 UTC
Maximum Pressure Altitude 5376 meters, GPS alt 5662
Time of peak altitude 22:55:04 UTC
Maximum altimeter reading 5456 meters, 17900ft
Lowest Pressure Altitude 2379 meters, GPS alt 2513
Time of lowest altitude 18:46:44 UTC
GJT Grand Junction 070614-0000 sounding
Sounding maximum is 5662, sounding low is 2491

To get sounding data go to: http://weather.uwyo.edu/upperair/sounding.html
For more information on correcting the GPS altitude calculation go to: http:www.ngs.noaa.gov/pubs_lib/gislis96.html for a well written paper on this subject.
See you at Parowan…

Handy Inspection Tool for Motorgliders

By Terry Edmonds

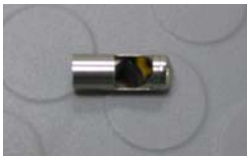
Some years ago I saw a manufacture display of a video borescope at EAA Oshkosh. A couple years later I was trying to find the source again but could not and have been keeping a watch for something like it to appear again. Within the last year I noticed similar products advertised for the home market but the probe is larger than desirable for our use. At Oshkosh last summer Snap-On Tools introduced a new product that was just what I had been looking for. They call it "Visual Inspection Device" model BK5500. The probe on this model is only 8mm diameter and has an adapter to look at a 90° angle as well as straight on and a magnet adapter. Being so small it has many uses for inspection of a motorglider. It works with both an image sensor and light source in the head.

I have only had the unit for a short time but have found many uses already for it. For example my DG-800B manual calls for removing the exhaust manifold at the 25 hrs inspection to check for cylinder seizing marks, deposit build up and sticking rings. The video device can do this job without removing the exhaust manifold by snaking the probe through the manifold into each cylinder for a close up look. Definitely a time and trouble saver. The probe can also go through a spark plug hole and get a good look at the condition of the cylinder walls.

Another example was when in replacing the batteries in my glider I dropped a brass washer into a cavity under the battery compartment that the only access is through slots the battery cables exit. I imagine I am not the first guy to do this. Although the washer down there probably would never cause a problem I am nervous about loose hardware anywhere in my glider. The washer being brass precluded using a magnet to retrieve and at first the job seemed to be impossible short of making a big access hole. The slots are too small for an inspection mirror but the video device allowed me to see the location of the washer and guide a small plastic tube connected to a vacuum to latch onto the washer and retrieve it.

These are just a couple of examples of uses as there are lots of locations in our motorgliders that are difficult or impossible to see or inspect with mirrors. There are many applications for this device outside of gliders as well.

The device has a small LCD color monitor that I find quite adequate. It does have a video output for connection to a larger monitor if you like. It comes with a 3' cable that is fine for most jobs but a longer one would be better for looking into places like wing cavities. The Snap-On manual says extensions can be assembled up to 30' but extensions don't seem to be available yet.



The current price for the BK5500 is $410. I bought mine for a little less at an Oshkosh show special so there may be other deals out there.

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
Ph: 952-941-5683 email:<Utleyb@aol.com> USA Dues $20/yr, $38/2 yrs, $55/3 yrs. International Dues $25/yr, $48/2 yrs, $70/3 yrs.

ASA Officers

President: Rick Howell	972-245-0830
Secretary: Lloyd 'Skip' Atwell	262-348-9488
Treasurer: Eric Greenwell	509-943-9065
Technical Advisor: Gary Evans	480-380-2431
VP & Membership: Brian Utley	942-941-5683
Safety: Oliver Dyer-Bennet	707-942-5727
Dir. & Publications: Gary Haynes	720-255-9650
Director: Terry Edmonds	319-624-2822
Competition: Rick Howell	972-245-0830
CFIG Training: Steve Dee	901-757-8784

APS NEWS Publication

Contributors please submit copy and materials to:
Gary Haynes, 145 Commander Circle, Erie, CO 80516
Ph: 720-255-9650 email: asa_editor@mindspring.com

Editorial Policy

APS NEWS material is freely contributed. The accuracy of the data and validity of opinions expressed are the responsibility of the contributors. Other publications may publish material printed herein, however a credit is requested. Manuscripts accepted for publication are subject to editing necessary within the confines of space available. APS NEWS is not responsible for lost or damaged artwork, photos & manuscripts.

Liability Statement

APS NEWS Editor has made every effort to ensure the correctness and completeness of the printing and publication of material in the issues. APS NEWS Editor has not investigated and makes no representations as to the accuracy or completeness of any information presented herein.

APS NEWS Publishing Information

Gary Haynes, APS Publications Manager is the Editor and Print Production Manager. The APS NEWS is printed in Minden, NV and mailed First Class. Contributors can mail hard copy text or use email. Text may be edited as required to fit the newsletter. Photos are always welcome. APS NEWS is delivered to the printer the last week of Jan, Mar, May, July, Sept and Nov. ASA desires input on what the members want in APS NEWS and we are doing all we can to keep it informative and interesting.

It's your publication, so please let us hear from you!

CLASSIFIED ADVERTISING RATES

50 cents/word, Prepaid for 2 Insertions Minimum, non-refundable. Contact Gary Haynes for Display Ad sizes and rates.
APS NEWS is published Jan/Feb, Mar/Apr, May/Jun, July/Aug, Sept/Oct, Nov/Dec

ASA is a Dvision of the Soaring Society of America

SSA Soaring Society of America NAA National Aeronautic Association FAI

FOR SALE

Powered Sailplane Instruction & Delivery

Dave McConeghey ATP CFI-Glider Self Launch Endorsement Kansas 316-409-9624
Email: <mcconeghey@gmail.com>

1996 Super Ximango 200 For Sale

Located in Iowa. $94,000 Dave McConeghey 316-409-9624 mcconeghey@gmail.com http://members.cox.net/motorglider

Scheibe SF-28A

1982 Tandeme-Falke motorglider, ~1200TT, 460 Engine (65hp Limbach 1700EA), custom covers, custom open trailer, Hoffman prop (recent overhaul), new canopy, new muffler and heater shroud. $47,500 Matthew Poleski, 815-544-3870, <matthewpoleski@aol.com>

Stemme S10V

Stemme S10V with Factory Trailer. Always hangared. Located in NJ. Engine hours 210. Airframe hours app. 400. No Damage History. Excellent Condition. www.rasair.com Email jojo94@patmedia.net

Valentine Taifun 17E

For Sale in Colorado. $65,000. Dave McConeghey 316-409-9624 Photos http://members.cox.net/motorglider

As factory new, sn #27, with polyurethane finish, winglets and most factory options, including solar, LX 7007 GPS Vario, Becker AR4201 radio& transponder, EDS 02, dual igniiton Sauer engine, one- man rigging and Top-Flight covers. Includes latest version Cobra trailer with SL package, solar & fan. TTAF 27 hrs. TTE 4.8 hrs. This Carat has done a 750km @ 75.38mph. Planning 1000K this summer. New racing version Carat on order.

AMS-USA 707-942-5727