

SONERAI

NEWSLETTER

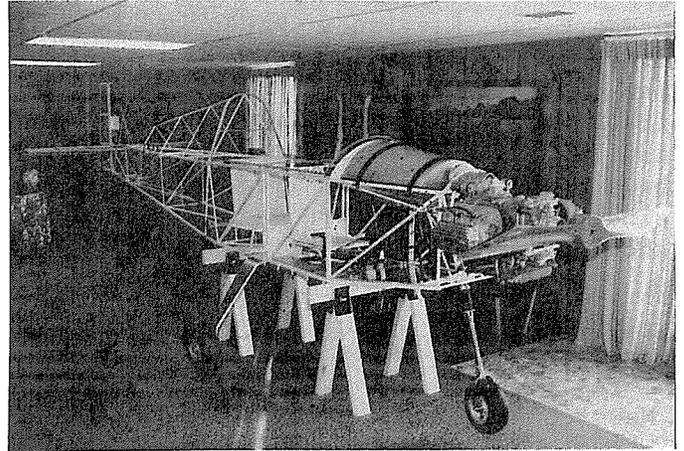
Welcome to the Second Edition

First off I'd like to thank all you Sonerai owners and builders for your \$12 vote of confidence in the Sonerai Newsletter. The response has been great with applications still coming in about every day. I'm looking forward to this and the next issues. You folks have sent in enough pictures and letters to keep the pages going for quite a long time. Of course this means that most of you will not get your pictures in this second issue, sorry about that but I promise to keep my own pictures out of it also. There is also the problem off getting all the Want Ads in this second issue, so I'll do the best I can. If you feel short changed on this give me a call or drop a note. Any of you that have tried to get a propeller from me know that a lot of noise on your part helps quite a bit.



Look real hard and trust me, they are all Sonerai's and there is no trick photography. Over Wisconsin.

Dick Morrow's LTS is coming along quite nicely. Wings are under way. Tubing paint is a baby blue color.



Just a couple of notes for things going on in the not too distant future--

Sun N Fun 88-- it's in April this year which some people seem to like and others dislike. It should make for a little better flying conditions for those of you leaving the colder climates. Personally I like having it cold in Illinois when I leave, but the number of homebuilts attending can be greatly affected for that same reason. So it should put a little more pressure on some of you to try to make it down there. See what you can do please be careful and plan the trip ahead. (Unless you have a Loran in which case you could paint your canopy flat black and still show up on final)

We are hoping to have a dinner at Sun N Fun also that may include other people that fly airplanes with car engines in them. Details need to be worked out.

I'll have a Sonerai forum in the middle of the week which should make the trip worthwhile just by itself.

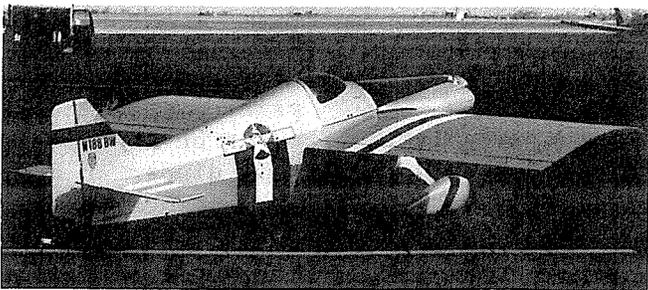
Hopefully there will be a Formula V race or demo race at Sun N Fun. Information on this can be obtained from Jim Vliet 12 Cooper Blvd. Red Bank, NJ 07701.

Formula V Racing

As indicated earlier I believe that most of you know that there is a racing class for our aircraft and it could use our support whenever possible. I gave Jim Vliet's address in the introduction, he puts out the Vee-Gram that is both interesting and informative and I highly recommend subscribing to it. The Formula Vee's have started to get some very good press (see Kitplanes recently). As with any racing it tends to push the machines and people to their limits and frequently brings in some new ideas that can be valuable to us all. The V Racers have had their best year yet and I sincerely hope they are able to make a showing in April in Florida.

New Sonerai Parts

As a lot of you noted in the last Newsletter, Great Plains Aircraft has begun supplying some of the hard to produce Sonerai parts. Some are in stock and others are in the process of being ready to stock. The next items include: Main Landing Gears, Wing Ribs, Fuel Tanks, Tail Wheels and most of the other Fiberglass parts. With the small volume of part orders at this time, delivery dates are a bit difficult to nail down. However, if you haven't got everything you need, keep in touch with me or Great Plains and it will eventually be in your hot little fist.



Bruce Miles beautiful Sonerai I
with Lyc.0-145 65 hp

Going South (by the numbers)

The annual flight in 78ES down to Sun N Fun this last year was made difficult in the beginning by absolutely rotter weather up in the northern Illinois area. I usually start checking the weather a few days ahead of time in order to get a feel for it,--- snow and solid IFR was the word. But 75 to 100 miles south it was decidedly better. Gregg Erikson kept in touch with his weather channel on the TV and finally gave me about a one hour window when the snow was very minimal. So I ran out to Lake in the Hills Airport and started the preheat on the VW waiting for the window of better weather. It came on schedule and I started the run south following Rt 47 since it was only about 1000' and 5 or 6 miles. By Joliet and Kankakee it was actually quite good and aside from 10 kts. on the nose things were looking substantially better. It was hard to get used to the idea that the "big trip" was underway since I had nothing but doom and gloom for several days and had almost given up on the idea of a week in Florida.

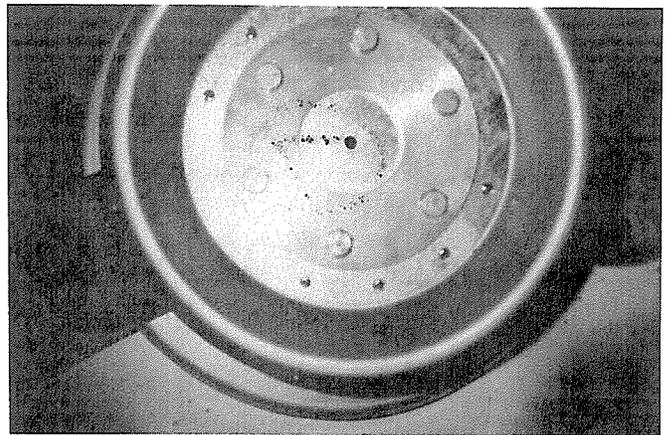
After spending the night in Huntingburg, IN (because of the late start) it was about 3 hours of 15 kt headwinds down to West Georgia Airport outside of Atlanta. As I was descending from about 4000' MSL after the beautiful trip over the high country of Tennessee, I was rather surprised to see a DC-9 fly under me heading westbound and slowly gaining altitude. The outer limits of the TCA at that point are from 10,000 to 12,500 feet, so I'd say he must have been slightly lower than normal. After taking on about 12 gallons of 100 LL (I carry a 6 gallon aux tank for X-C flights) and receiving a forecast of good weather but more headwinds, I decided to go up to about 7000' MSL and see how Georgia and Florida looked from there. I picked up Interstate 75 south of Macon and just followed it all the way down since it makes a nice runway if needed and has an airport about every 30 to 40 miles.

Spinners and Bulkheads

Since I couldn't afford a manifold pressure gauge, I have had an automotive vacuum gauge in the Sonerai for a few years and tend to use it for setting my power. As a general rule at low elevation you can expect 5" or 6" of vacuum to correspond to 70 to 75% power, this being our normal cruise. A vacuum gauge doesn't have a sealed chamber in it like a man. pressure gauge so you have to compensate for your altitude since all it can tell you is the difference between the pressure in your intake manifold and the pressure surrounding the gauge. Well, here is how the numbers worked out on that 7000' MSL leg to Ocala, Fla. The air temperature was 60 F. at that altitude and the engine was turning 3100 RPM with a vacuum reading of 4" Hg and the indicated airspeed was 118 MPH. Using my old flight computer this works out to a density altitude of just under 9000 ft and a TAS of 135 MPH. Knowing that the maximum horsepower available at 8000' is 75 % (because of air pressure) we know that the power setting has got to be below 75 %. Now for the manifold pressure---- with sea level pressure being 29.92 Hg (or 30 " Hg) we can subtract 4 " Hg as shown on our vacuum gauge giving 26 " man. press. But we are at an altitude of 7000 ' (9000 ' density) so we need to subtract an addition 7 " Hg giving an actual manifold pressure of 19 " Hg. Since my engine will turn about 3700 RPM maximum wide open and it was only doing 3100 at cruise, it was turning about 84 % of it's max. This is the equivalent of an 0-200 turning about 2300 RPM versus the 2700 it is rated at. By my reckoning, 19 " man. press. and the 3100 RPM at that altitude works out to just about 50 % power (and corresponds to the Cessna 150 at 7500 feet and 2300 RPM and 50 % power)

So what does all this mean, you ask? Well, if you're at a fly-in and some green horn asks you how fast it will go-- you can say that at 50 % power it will do 135 mph--- and if he says that wide open it must be twice that fast!--- then all you have to do is smile and say that it "sounds good" to you.

The spinner on our rather high RPM engines can be a real maintenance item on an otherwise low maintenance airplane (?). Like many other things on a homebuilt, there are a number of ways to make sure it stays where it belongs, which is generally on the front of the plane. The standard procedure is to use pan head type screws to accomplish this task, although a number of people have used countersunk screws and washers. I once saw the entire spinner pop riveted in place. Talk about confidence in your bolt torque! I recommend using screws in the forward bulkhead since it seems to me that the higher RPM will expand the spinner off the bulkhead and perhaps wobble. Maybe I'm wrong on this as it is rather hard to see in flight.



The forward bulkhead is also reinforced with 26 ga. galvanized steel and the epoxy buy cutting a disc to fit inside the cone of the bulkhead. The 1/4" crush plate is outside of this steel disc. The forward bulkhead and the steel can be riveted to each other with 8 to 10 pops on the outside edge where they won't hit the prop blades or hub. It should stop a .50 caliber bullet when done like this. If and when the forward bulkhead ever fails, it can be a rather messy affair with pieces all over. This is why a lot of us keep a cable tying the engine to the airframe should the prop also be damaged. Like aileron flutter, it happens rather quickly and is about as deadly.

Keep one as a spare-----

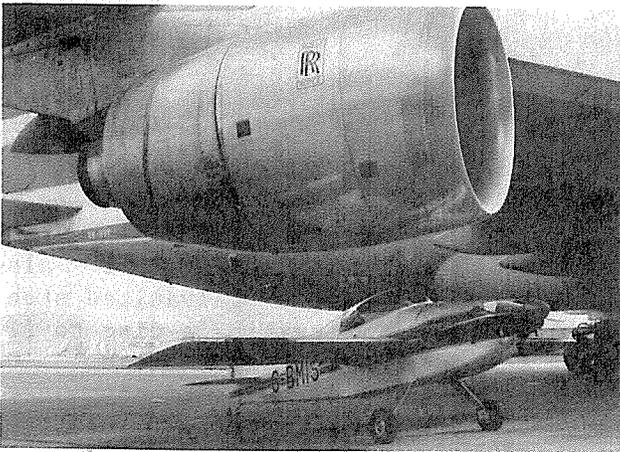
(The names on this one are going to be withheld to avoid acute embarrassment)

My spinner cracked at the blade cutouts early in it's life and then lasted 7 years with a patch on each side. The forward bulkheads have a much shorter life span with the people I know. So with my new spinner and forward bulkhead it was decided to make it bullet proof as they say. The blade cut out was carefully smoothed and radiussed (?) and then I cut a 1" wide reinforcing strip out of 26 ga. galvanized steel that is not only rivetted but also epoxied with aluminum filled epoxy. So the blade cut out should give no trouble. Please don't let any of this metal touch your wood prop or it will break through the finish quickly. People seem to think that you need a very close fit between the prop and spinner, but I have found no change in speed or engine cooling when running without any spinner at all.

The VW had been bumped up to a brand new 2180 and installed in the nose of a Sonerai II, so while there were more cc's the compression ratio was lower making it difficult to decide if the old propeller was going to need adjustment. Starting was a bit difficult as it can be with a new engine and the initial idle seemed a bit rougher than usual, but it was all new parts and at least it was running. After a while the power was advanced to get out of the rich idle range of the Posa and things seemed to smooth out quite a bit. After a few run-ups like this, checking for oil leaks and the like, full power was brought in and registered a rather disappointing 2700 RPM. Well, that wasn't as good as before and the talk centered in the lowered compression ratio and the need to readjust the Posa for the larger cc engine.

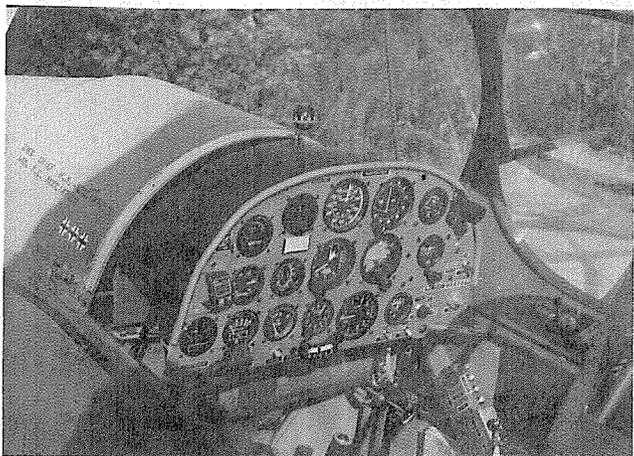
With no great improvement in RPM forthcoming the decision to fly or not came up. We usually like to see 2900 to 3000 static, but then it wasn't that far off-----? So lets check the mag timing and the plugs first and do the Posa last. The timing came out alright and the first couple of spark plugs showed the typical thin layer of black soot that is formed by the idling Posa carb. But the last plug was clean -- real clean -- way too clean -- like never fired too clean! When a light was shown in the spark plug hole it just shined right back out -- it was clean in there too! The darn thing had never fired!

The problem was quickly traced to a kinked spark plug lead that was confirmed at the FBO with a high tension lead tester. Run up now was back where it belonged at the 3000 RPM range. The bigger engine with the lower compression ratio was apparently as strong as before according to the propeller. But we all had to ask ourselves a few tough questions

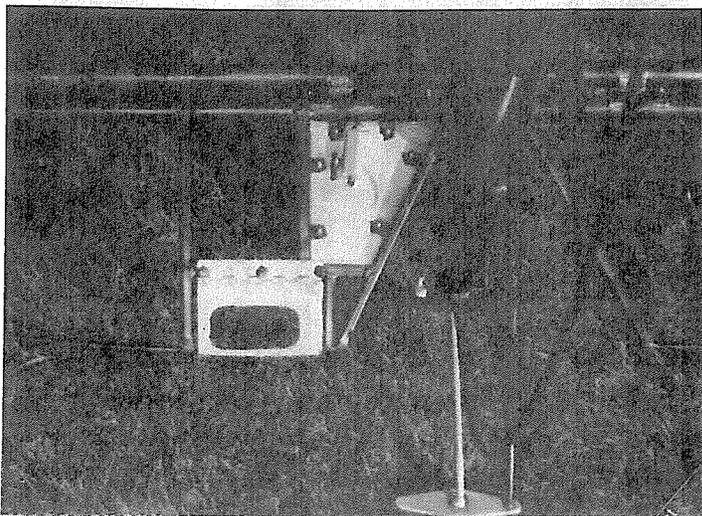


**Captain Barry Bower's Sonerai II
under his Cathay Pacific 747**

-- was the engine so smooth on 3 cylinders that we couldn't tell? -- and were we ready to head out on a test flight with only 3 cylinders working? So a decision was made to designate the 4th cylinder as a "spare" cylinder in case one of the others quit working. I mean, we had heard that some airplanes even had two magnetos in case the other one quit working. (Honest, it didn't feel that rough.)



George McClintock's very full panel
(Look at all the clocks in this one, dear)



Fred Kugel's electric trim system

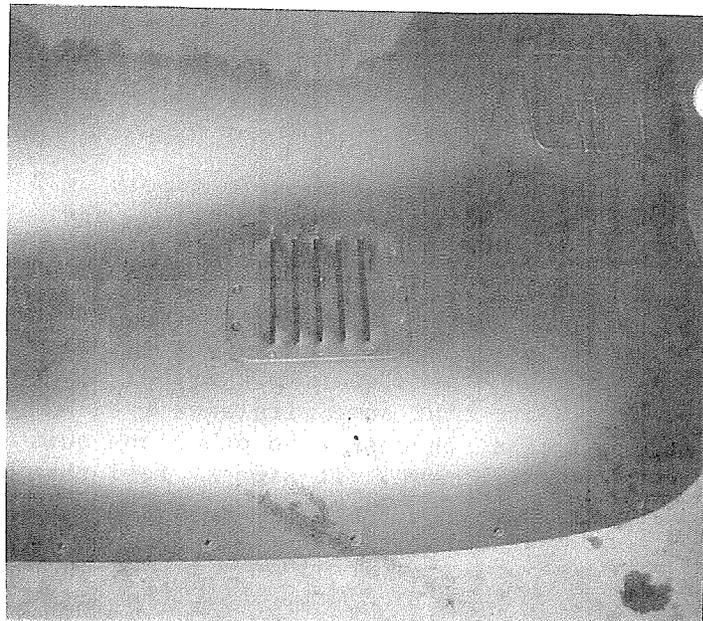
First Flight

So what do you do when the new Sonerai is finished and signed off for flight? Well, I guess you fly it --- if you feel you are the proper person to do that. If you have a tail dragging Sonerai and don't have any tailwheel time then there could be problems. I personally know of about 6 planes that have been damaged because the pilot wasn't up to that first flight. Surprising to me the majority of these "incidents" have occurred on the first takeoff (or attempt). The Sonerai's with the larger engines seem more susceptible to this problem. The airplane frequently ends up on it's back. While you may not want a crowd of onlookers around for that first flight, it is important to have someone there.

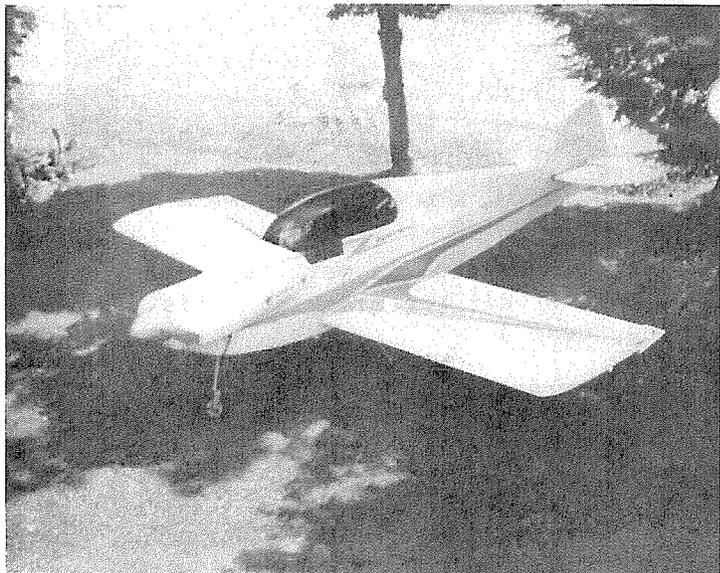
How can this happen? Well, you have a light nimble airplane with quite a bit of power for it's weight. You also have reverse propeller rotation and in some people's opinion a rather small rudder. With my small 1850 engine I can force the tail up as soon as possible with full forward stick to save that little tailwheel, but friends with the 2180 engine recommend holding full aft stick to maintain tailwheel steering until about 40 mph when the rudder becomes more effective. It will be only a few seconds until you see 60 mph at which time a little aft stick will cause liftoff. It seems difficult to get a smooth initial climb, my airplane seems to want to leap into the air instead of gradually levitating. We have a 3000 ft. runway at Lake in the Hills Airport and a standard day solo takeoff usually is 800 to 1000 ft. This is with a rather slow smooth application of power. Popping the throttle on takeoff would probably help, but full throttle while standing still seems to cavitate the prop-- people nearby can hear it "wow" with certain props. Seems like wasted energy to me.

John Monnett has always advised against full power high speed taxiing and I agree. With the tail up in the air, the end of the runway getting closer and 50 mph on the airspeed, you will feel obliged to chop the throttle. (Remember those Azusa brakes) When was the last time you practiced aborted takeoffs? I never did, and that is where the trouble begins (it ends about 500 ft further down the runway in a cloud of dust). So what do you do if you really, really want to do tail up practice runs? Don't use so much power. You need about 10 horsepower to move a Sonerai at 50 mph, so why use 60? Apply power and as soon as you have reasonable speed, begin retarding throttle so you don't end up with a sudden combination of not enough runway, no power and a real tap dance on the rudders. I feel it is that sudden reduction with all the changes at one time that ensue that causes most of the problem.

By contrast most people have one of their best landings that first time. Sort of like your first solo. A commonly asked question has to do with approach speeds, landings speeds, etc. And all of these have to do with your airplane. Is the airspeed accurate? How are the ailerons rigged? What about your weight and balance? The Monink and Randy Novak's Notes have recommended the ailerons be dropped about 1/4 " so the counterweights are up the same amount. This allows a more positive, crisper response also. As a rule most Sonerai's that fly with the horizontal stabilizer adjusted all the way "up" are quite noseheavy. Be prepared if you rig this way, it can be quite pronounced! On my first flight it felt like N78ES would have done outside loops all the way to ground level had the control stick been released. It is now down 12 washers and I have 4 lbs. of lead in the tail. So depending on a few factors, most of us use 80 mph on final approach with 70 over the fence and 60 mph as you flare. Changing the aileron rig, or the angle of incidence of both wings can have a noticeable effect on the landing feel.



Dave Rawling's Sonerai II cowl vent to keep engine temps down after flight



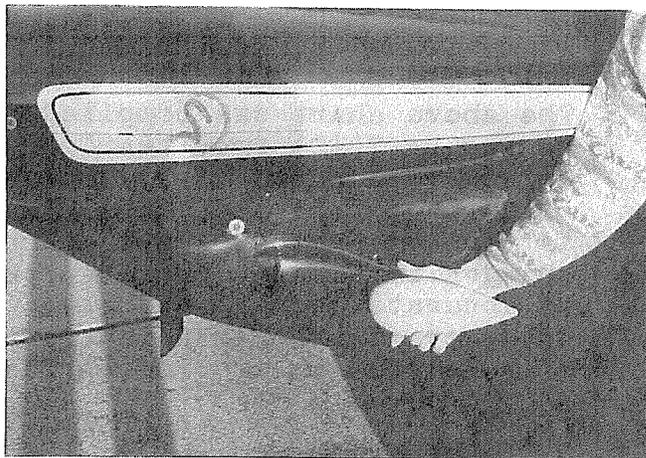
Rudolph Monteleone's Sonerai II LT

Gypsy Mag Timer

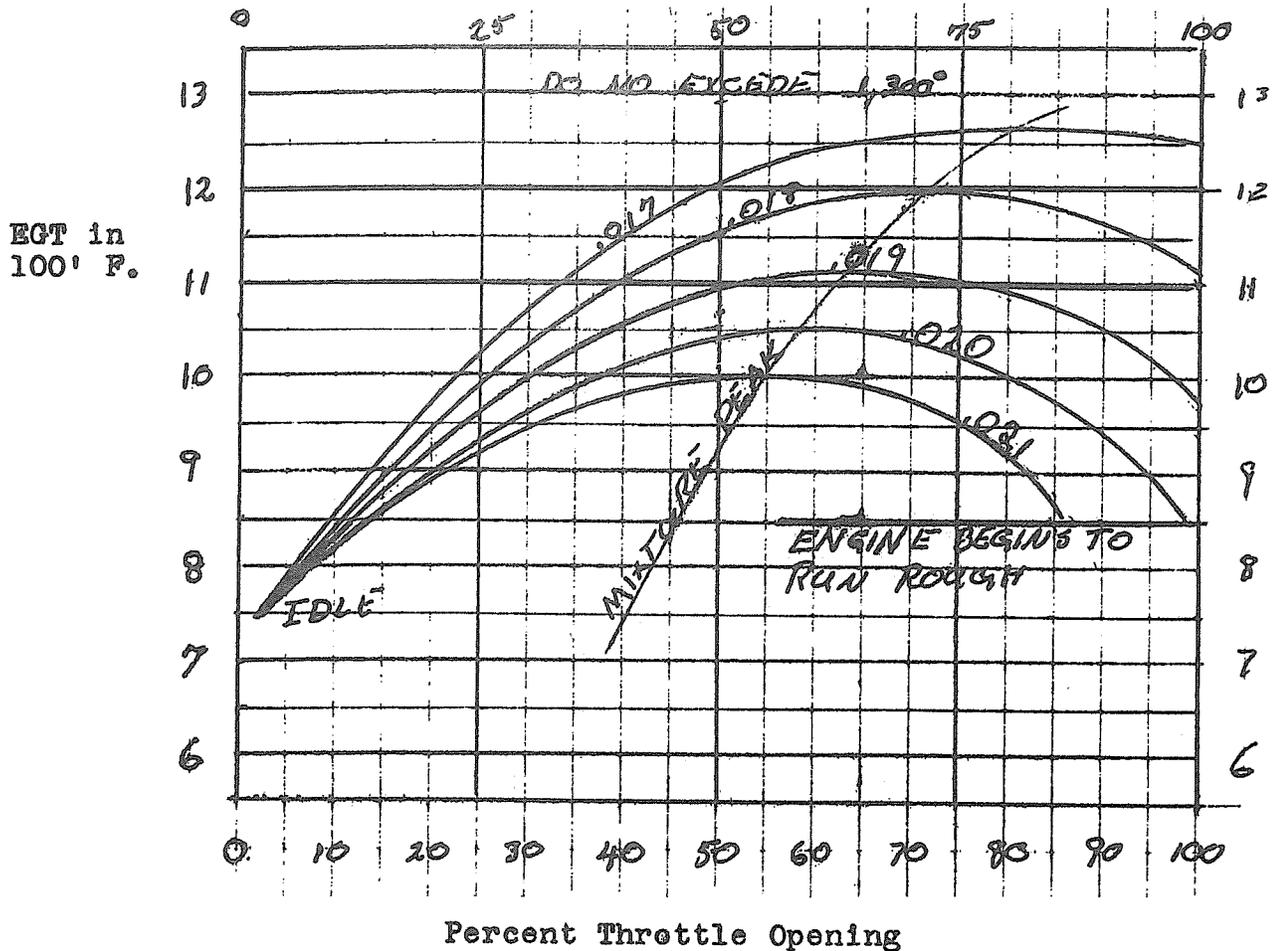
I had a phone call from Bob Jaeger of Northlake, Ill. the other day. Bob's Sonerai II is getting finished and he is in the process of starting and breaking in his 2020 VW. Aside from the Posa ritual he must attend to, we talked about magneto timing and ensuring it was approximately where it should be for this initial run-in. Since he isn't concerned with power output yet but wants to make for easy starting on a tight engine, I told him it wouldn't hurt to retard the spark later than the usual 25 to 28 degrees. Remembering as we all do that the impulse retard on our 4016 and 4216 mags is 25 degrees, it would ease starting by getting the plugs to fire after TDC. Bob didn't have a ready access to a magneto timing light but he had heard of Radio Shack, so I gave him the part number for the world's cheapest magneto timer/ continuity tester. If you buy p.n. 273-053 electronic buzzer, 2 AA batteries, some wire, alligator clips and a switch of some sort you are in business. They also sell a plastic battery holder for 4 AA cells that will contain the buzzer, batteries and switch. I carry one on all trips.

You will wire the buzzer in line with the batteries and switch so when the leads touch the buzzer will sound. That is it! The impedance of the buzzer is such that it will change tone when the magneto points open. It will not stop and start buzzing because of the internal wiring of the mag, but the tone will change enough to be noticeable. To use the timer, pull all your spark plug leads off for safety sake. Bring # 1 cylinder up to TDC firing the impulse coupling. Then back the prop up enough to get your 28 degree timing mark near position (the split in the case). At this point turn on your ignition switch and hook the timing leads to the "P" lead of the magneto either at the mag or at the switch. The other timer lead goes to a ground or the shield on your "P" lead if you have shielded cable. (I do)

Now if you rock the prop back and forth you should be able to hear the buzzer change tone as the points open and close. That is what you want to know after all isn't it? ---- when they open the plug fires. Please one caution, do not have the timer hooked up when the impulse coupling fires the mag, it is a 3 volt buzzer not 15,000 volt buzzer. Also remember that you want to check for the point opening in the normal direction of prop rotation to take up the gear lash. Those of you using battery ignition can also use this little device as a continuity tester to find point opening. Or you can use an automotive timing light (strobe) and run the engine as you would in a car. But be careful!!!,



Neil Sidder's air inlet made from a model aircraft wheel pant



EGT probe located $1\frac{1}{2}$ " from flange with $1\frac{1}{2}$ " Exhaust pipe

The above chart was compiled by Neil Sidders Rt 5 Box 357-A Monroe, LA 71203 from testing with his Sonerai IIL 1834 VW with a 32mm Posa carb. Neil has modified the carb to include an idle mixture control and makes his own needles to ensure accuracy. As you can see by studying the chart, it is very sensitive to changes in taper. Neil can provide you with a new needle (that is accurately made) and also plans for the carb mods. Knowing the accuracy of other available needles, may I highly recommend him if your Posa is proving difficult to adjust properly.

ENGINES AND MISCELLANEOUS SONERAI PARTS

Great Plains Aircraft Supply Co. Inc has several needed Sonerai II parts available. They have cowlings at \$275.00 (plus \$15.00 crating fee), heat treated tailwheel springs at \$65.00 each and Sonerai spinners that fit a 2-1/4" thick prop. The spinners are (12") \$36.95, the front plate is \$23.70 and the back plate is \$16.60. In addition to these parts, Great Plains Aircraft can supply you with a completed engine, engine kits or individual parts to build your own engine for your Sonerai. They also have shrink fit prop hubs available at \$119.95.

Their engines have a Sonerai style intake manifold, 20 AMP alternator, oil cooler, starter and choice of ignition systems. To contact them write or call: Great Plains Aircraft Supply Co. Inc., P.O. Box 1481, Palatine, IL. 60078, or phone 312-359-6558. Their catalog is \$3.00.

**** FOR SALE ****

Complete fuselage tubing kit--\$500.00 or trade for wing kit
Paul Biegun 1245 W. Wellington Ave. Chicago, IL 60657 312-477-1607

Narco MK 12A Nav/Com to trade or sell for unit with Glide Slope
Archie Frangoudis 162 Naticook Rd. Merrimack, N.H. 03054
603-883-5800

Sonerai II Canopies (2 ea.) -- \$100.00 ea. for regular or stretch
Bob Jaeger 461 Major Dr. Northlake, IL 60164 312-343-9227

Monnett Flat Oil Separator \$20.00 Altimeter (needs repair) make offer
Fred Keip 11428 Six Mile Rd. Franksville, WI 53126 414-835-7714

1835 VW engine w/Posa carb, Slick mag, tuned exh., oil cooler, prop, spinner
Sonerai motor mount
R.E. Mitchell 8 Harbour Hts. Ln, St. Catharines, Ont. Canada
416-646-2440 L2N 4K3

Sonerai Wheels, Brakes and Axles/ Revmaster Acc. case w/starter, Intake
system Richard Morrow 418-24th Ave. Ct. East Moline, IL 61244
309-755-1495

1800 VW Monnett conv. w/ Super Vee Extension
Ron Reimer 2113 Speed Ave. #1 Louisville, KY 40205

Ultracarb -- John Santenecite 28 Wetherstone Dr. W. Seneca, NY 14224
716-674-7403

Fiberglass Wheel Pants for Taildragger
Ken Wasielak 29W153 Janet Ct. Naperville, IL 60565 815-436-6791

Supervee Housing and Bearing / 54X46 prop 4th St. Aero 502-458-3127
Eliot Willoughby 2426 Ashwood Dr. Louisville, KY 40205



Ron Paulbike's Sonerai II apparently ready for the invasion
of Europe

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