



Martin Hammersmith's Sonerai IIL

Hello, from Ed Sterba !! Welcome to the final issue of the Sonerai Newsletter for 1996. This will be my last installment as Editor of the Sonerai News, for Fred Keip is taking over the helm in 1997. To tell the truth, he has contributed more to the 1996 issues than I did, partially since his Sonerai IIL is in the air and flying, and mine has been on a sort of static display at the Sky Struck headquarters in Oshkosh with John Monnett for the last three years. N78ES was first flown on Nov. 25th, 1978 and has about 900 hours on the tach. It certainly served me well, and a guy couldn't ask for a more fun, inexpensive way to get in the air. There were years in it's life when my maintenance budget for the year amounted to not much more than \$10.00. She burned 4.1 gal/hour at cruise, about a pint of oil between changes and went through a set of tires every third year. You will all be in good hands with Fred, he knows the Sonerai well. Keep in touch! 1997 Sonerai Newsletter subscriptions should go to Fred at the address on the mailing label page.

OSHKOSH IMPRESSIONS

by Marty Hammersmith

I thought that rather than my rambling on about the Oshkosh experience, it would be fun to let one of our newsletter subscribers do it instead. So, here is Marty's letter. FJK

Oshkosh has come and gone for another year. For me it was an exceptionally good trip. The Sonerai turnout on the flightline was great. I regretted that I was unable to fly my ILL in, but while the Sonerai's are versatile, they have yet to be able to transport a family of five!

I attended the VW engine forum hosted by Steve Bennett of Great Plains fame and it provided some information that wasn't discussed at a similar forum I attended in the spring at Sun-N-Fun. This is understandable as forums many times go in the direction that the questions from those attending take it. If you've never made this forum, I highly recommend that you do so. If you have been to it before, I recommend you go again. It is always interesting and sometimes entertaining to hear what others are doing or what they want to do with our beloved VW. Sometimes it's downright scary.

I also attended the Sonerai forum which was hosted by Fred Keip with John Monnett as the key speaker. I have already subscribed to the "keep it light" philosophy so it was nice to hear John repeatedly answer questions with "I don't want you to do that" or "you don't need that."

Back on the flightline, I observed as one might expect, that none of these aircraft are the same. If my aircraft had been there, it would have had the most blunt front on the canopy, the most acutely swept leading edge on the propeller, and the tallest round tail. It would have landed in the light-to- middle of the pack on empty weight at 546 pounds with 20 amp alternator, oversize battery and transponder with encoder. I'd be one of only a couple Sonerai's still using the 1/2" gear. Mine has held up well so far and I haven't had to bend it back into place yet. I'll stay with it and the four pound advantage it has over the 5/8" gear until there's a compelling reason to change. Besides bending, has anyone managed to actually break the 1/2" gear?--- ahh, in a reasonable landing that is.

I came away with ideas such as to move the Comm antenna to inside the turtledeck as one fella had done. He claims "reasonable" radio range. My Icom A-22 with external antenna on the belly has transmitted and received a verified 50+ miles. If the installation in side

the turtledeck cut that in half I'd still be OK and it'd be a great aerodynamic cleanup.

My aircraft has a disgusting blister on the chin where the air intake filter resides. On the flightline I saw the integration of the air intake filter with the engine sump belly pan. Ingenious little design that'll allow me to remove the entire blister and return the cowl to its proper streamlined shape and lose the weight of the blister.

I inquired as to the batteries people were using. I have a battery that's about half the size of a typical automotive battery located behind the pilot's seat. In addition there's about 4 pounds of lead in the tail. Converting to a 6.5 amp-hour sealed battery which I saw in several of the airplanes will probably save as much as 8-10 pounds and by locating the smaller battery in the tail should allow removal of much of the lead in the tail. A further weight reduction.

This winter's plan is to make a plug from the current cowl, make a mold and pull a new cowl, probably of vacuum bagged epoxy and graphite. This will compliment the epoxy and E-glass wheelpants I pulled this past spring from the mold I made last fall. Those pants, while not bagged or of graphite, still shaved about a pound off the empty weight and now I have a mold should I be unfortunate enough to wack a pant. The pants that came off were pretty beat up and were trimmed kinda funny around the wheel openings.

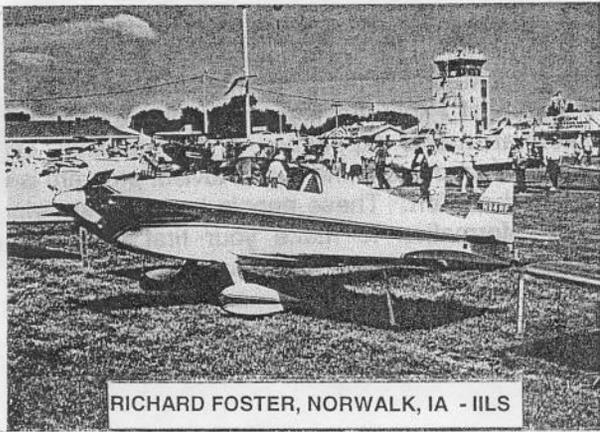
I noticed that several of the aircraft were sporting brake lines that were taped to the trailing edge of the landing gear. My lines have been chafing and are mounted loosely in clips. The clips will be gone shortly.

Yep. Visiting OSH was definitely worthwhile. At the very worst, it generated renewed enthusiasm to continue the ongoing Sonerai restoration/improvements and at best gave me several great new ideas.

Incidentally, I have a set of plans for the II but I didn't build 49WE. I purchased it last summer. That may help explain why so many changes are in the works

Marty

**Marty Hammersmith
1777 Oak Ridge Dr.
Lawenceburg, IN 47025**



RICHARD FOSTER, NORWALK, IA - IILS



JON HUBBELL, FOUNTAINTOWN, IN - IIL



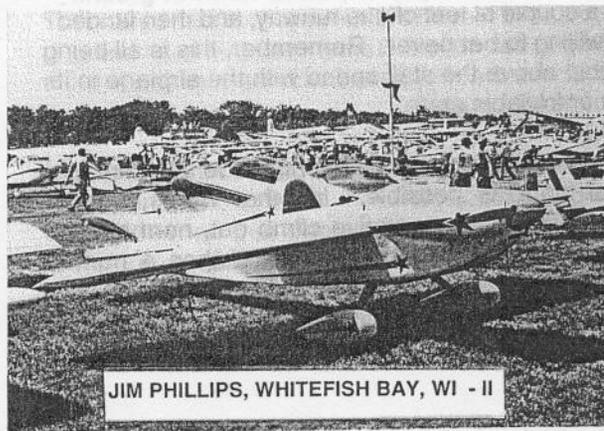
DENNIS OUVERSON, CLEAR LAKE, IA - IIL



FRED KEIP, FRANKSVILLE, WI - IIL



LOU NOVAK, BENSENVILLE, IL - IIL



JIM PHILLIPS, WHITEFISH BAY, WI - II



DANNY KIGHT, ANDERSON, SC - IILT



DAVE PATTERSON, FALL RIVER, WI - I

FIRST FLIGHT COMMENTARY

(An editorial of sorts)

In the last edition of this newsletter we published a very well done article by Dave Wilcox entitled **Discussion of Modified Sonerai Accident, N36AL**. The results of his analysis points to the risks of perhaps unqualified people making major modifications to a proven design. Among his conclusions, Dave talks about his plans for flight testing his own modified airplane, which include ground-effect hops down the runway. I feel the need to comment.

To start out with, I am not an advocate of what some people have called "crow hop" flight tests down the runway. I have several reasons. First of all, I think the risks are too high. You are combining the two most critical phases of flying an airplane, the takeoff and the landing, and forcing them to happen one right after the other. Believe me, this is not as easy as it sounds. I have had to abort two takeoffs right after liftoff with my Sonerai, and it took all of my concentration to pull them off successfully. And this was after I had several hours and several takeoffs and landings in my log.

Second of all, most of us builder/pilots are not very high time pilots, and most of us have never tested a brand new airplane before. How many times have you taken a trusty Cessna 150 or Cherokee 140 down the runway, lifted off with partial power, flown in ground effect a couple of feet off the runway, and then landed? I'll be willing to bet never. Remember, this is all being done just above the stall speed with the airplane in its least controllable state.

Thirdly, I feel that a first flight should be as close to a normal flight as possible. In other words, normal takeoff, normal conservative climb out, normal level flight with turns and slow flight, and then a normal approach and landing. This should be done right over the top of the airport or slightly upwind of the airport so the wind will blow you back to the airport should you lose power.

Finally, a couple of suggestions that worked for me. First, taxi the airplane a lot before you fly it. This will instill in your brain the landing attitude, particularly in the taildragger. And secondly, if you are building the taildragger, it is an absolute necessity to get a through checkout in a tailwheel airplane with a qualified instructor. A couple of hours of dual is not enough. Don't get cheap at this point. You've spent all the money to build the airplane, and it really seems foolish to me to risk all that for a couple hundred dollars worth of dual.

Also, make use of the EAA chapter system and their network of Flight Advisors. There's a lot of good information and experience in the members of the chapters, and use of the Flight Advisor program is well worth the effort. These people have the knowledge and information to make your first flight and all subsequent test flights as safe as possible.

A Note on Azusa Brake Linings

Steve Bennett at Great Plains Aircraft Supply advised the other day that it would probably be a good idea if those of you flying above Azusa mechanical brakes spent time riveting the brake linings to the shoes. This is normal practice on the more expensive Cleveland types. Your Azusas on the other hand are glued onto the shoe and there have been cases where the lining has come loose, apparently from heat. Ironically, those of you that have worked hard to get the brakes to grab better have probably accentuated the problem by allowing them to accumulate more heat by working harder. For those of us that still live with the pulsing on rollout from out of round drums, well, it just goes to show that laziness is its own reward.

In the mean time, should you desire to rivet those lining in place, it is recommended that you obtain the correct rivets for the Cleveland type and countersink the linings as necessary to seat the rivets sufficiently below the surface to allow for wear. Two rivets per lining should suffice. Since the rivets are a flat type (not countersunk at 90 degrees, etc.) you will need to use a drill press and perhaps an end mill cutter or at least sharpen a twist drill bit to the flat bottom. Practice on some other material first. Good luck.

JACKSCREW TRIM

by Fred Keip

I've been promising, for the past couple of issues, that I'd describe my newly installed pitch trim system. Well, here it is for your consideration. As I mentioned in the last issue, the system works well, but has a little more friction than I had originally anticipated. This isn't bad because it helps insure that the trim setting doesn't move on its own.

Basically, this is a jackscrew type of trim system, not unlike that found in the Piper Cub. In fact, it is modelled after the system in the Baby Great Lakes biplane. Trimming the airplane is accomplished by moving the horizontal stabilizer up and down with the jackscrew mounted in the tail of the fuselage. It is driven by a cockpit mounted pulley driving a closed loop of 1/16" aircraft cable around a pulley in the jackscrew drive. The entire system was designed to be bolted into my already completed fuselage, so it should be possible to install it into an already flying airplane.

Rather than spending several thousand words trying to describe the system to you, take a look at the seven photos and figure 1 while I touch on the high points. Hopefully, you'll be able to develop your own system without too much difficulty.

Photo 1 shows an overview of the cockpit end of the system. It shows the drive pulley/trim wheel, the 1/16" cable, and a portion of the front cable fairlead. Photo 2 shows a closeup of the cockpit trim wheel. It is basically a 3" diameter AN240-4A phenolic pulley, which is mounted to the L.H. cockpit diagonal tube using an AN4 bolt, a 4130 u-strap, and a piece of 1/4" bushing stock. I ended up pop riveting the strap to the diagonal to lock its position. (On a new airframe, a piece of 1/4" bushing stock could be welded at this location.) Although it can't be seen, the cable is wrapped around this pulley one and a half times to insure sufficient driving friction.

Photo 3 shows the forward cable fairlead, which is used to keep the cable against the side of the fuselage and to force the cable into alignment with the pulley. It is made from a piece of ultra-high molecular weight polyurethane (which is used to line material handling chutes, and is very slick and strong.) It has 5/64" holes through which the cable is threaded. Photo 4 shows the rear cable fairlead. It is mounted just forward of the rear jackscrew pulley, and it insures that the cable is properly aligned with that pulley. The attachment is self explanatory and it is also UHMW polyurethane.

The jackscrew drive assembly is shown in photos 5, 6, and 7, and figure 1. Photo 5 shows an exploded view of the parts, and photo 6 shows them assembled. The

pulley is an AN240-3A with the bearing removed and replaced by an aluminum hub which is detailed in the upper L.H. corner of figure 1. This hub is epoxied into the pulley. The pulley/hub combination rides in two 3/4" ID, 7/8" OD flanged, bronze bushings from Ace Hardware. The bushings are press-fit into two .063" thick 4130 mounting plates which are separated by steel bushing spacers, and bolted with AN3 bolts.

The jackscrew is made from Ace Hardware 1/2" threaded rod stock. The lower end has two flats ground on it to facilitate the drilling of a 3/16" hole for attachment to the horizontal stabilizer bracket. The stabilizer bracket is fabricated from .063 4130 sheet stock. Photo 7 shows the entire assembly bolted into the fuselage. I found that I had to lengthen the slots where the leading edge of the horizontal stabilizer passes through the fuselage, so that there was enough clearance to install the AN3 bolts holding the bracket to the horizontal stabilizer.

Figure 1 is a full-scale drawing of the side and top view of this assembly without the AN hardware. (Note that if you are in the process of building the fuselage, you could add another cross tube behind the jackscrew to provide additional support for the mounting brackets. This is not necessary, but it would make for a much more secure mount.)

The cable is wrapped around this pulley one and a half times, too. It is installed so that when the cockpit pulley is turned counter clockwise, as viewed in photo 2, for nose down trim, the leading edge of the horizontal stabilizer moves up. The cable should have an AN140-8S turnbuckle installed between the two fairleads to maintain sufficient cable tension.

That's basically how I did it. There are probably several detail variations that can be used. Go ahead and give it a try. This system has made my airplane easier to fly on cross countries, because it is much easier to hold altitude, and it will now fly hands-off in relatively smooth air, which means I can now unfold and refold a sectional chart without the airplane diving into the ground on its own.

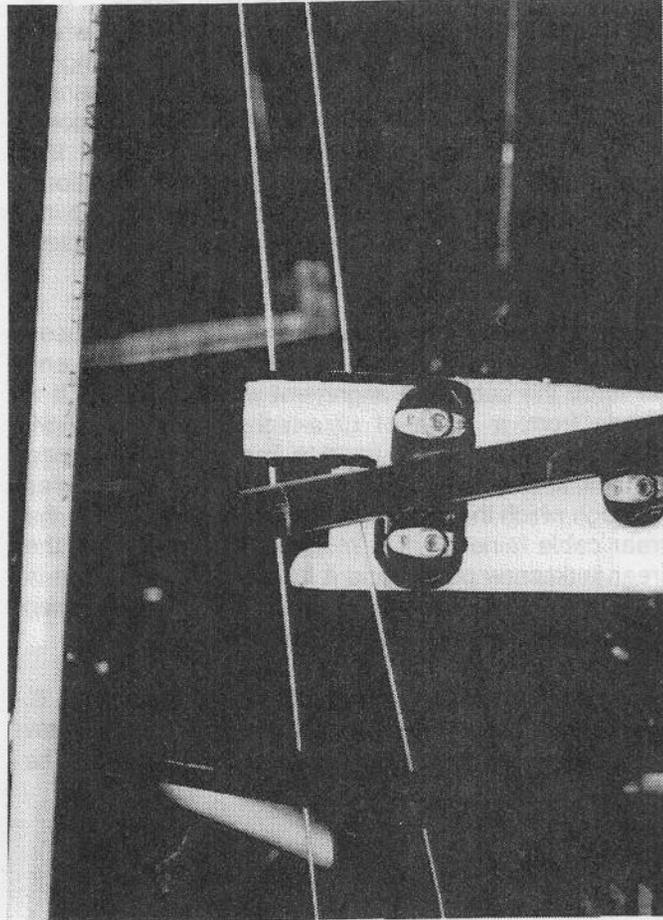
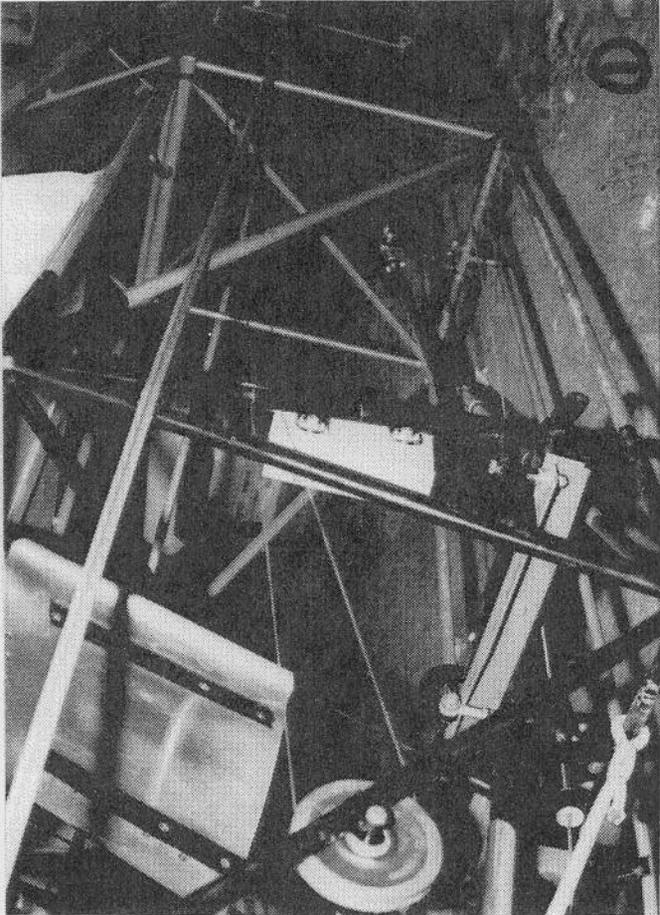
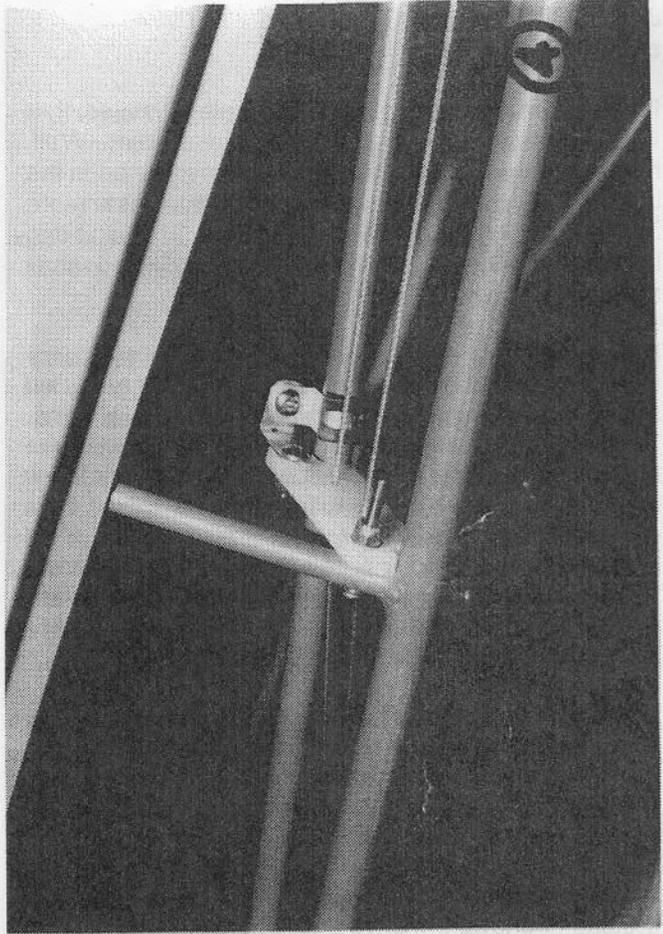
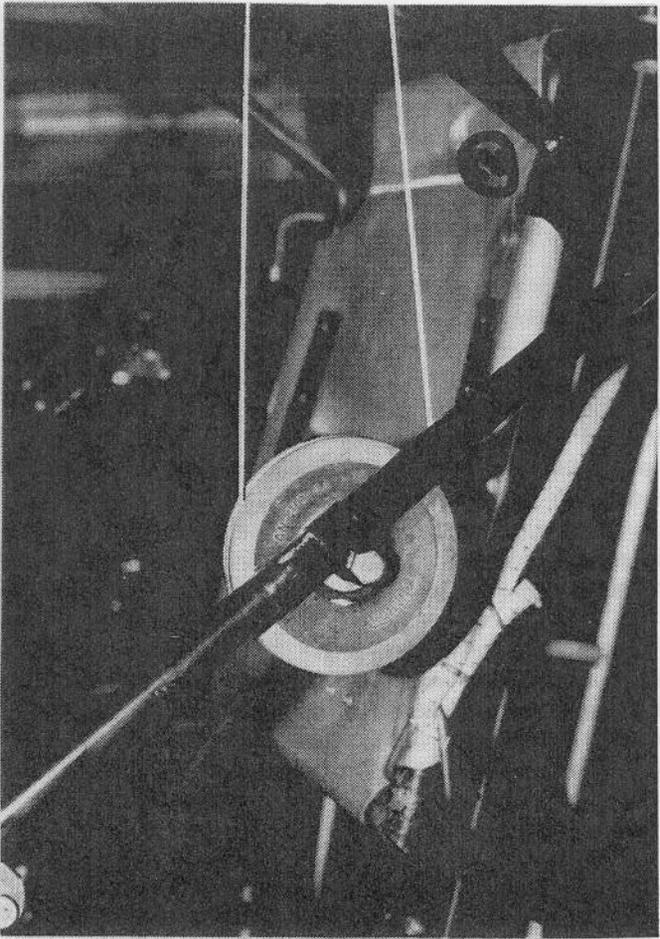
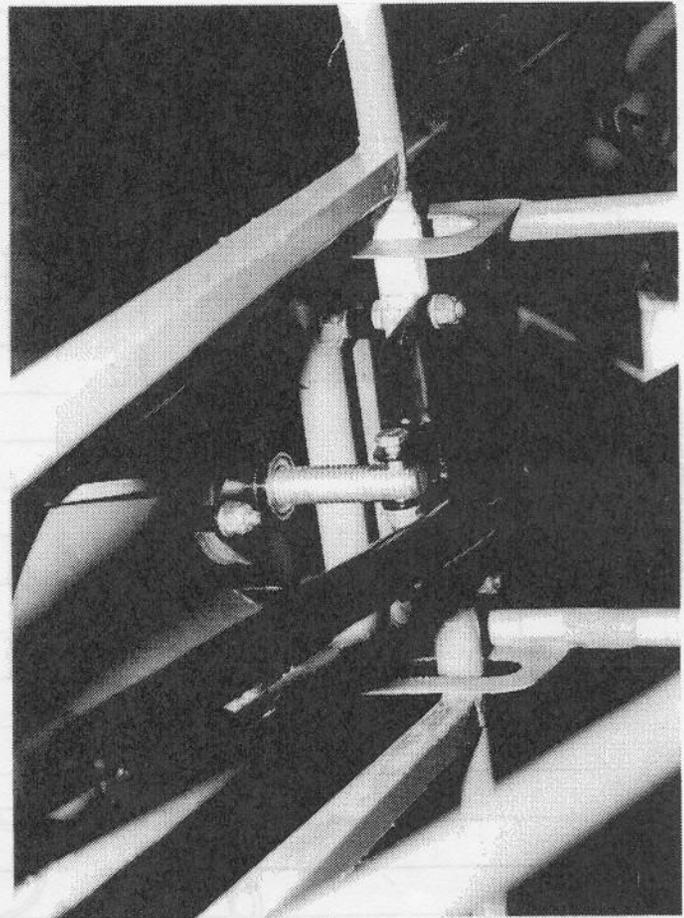
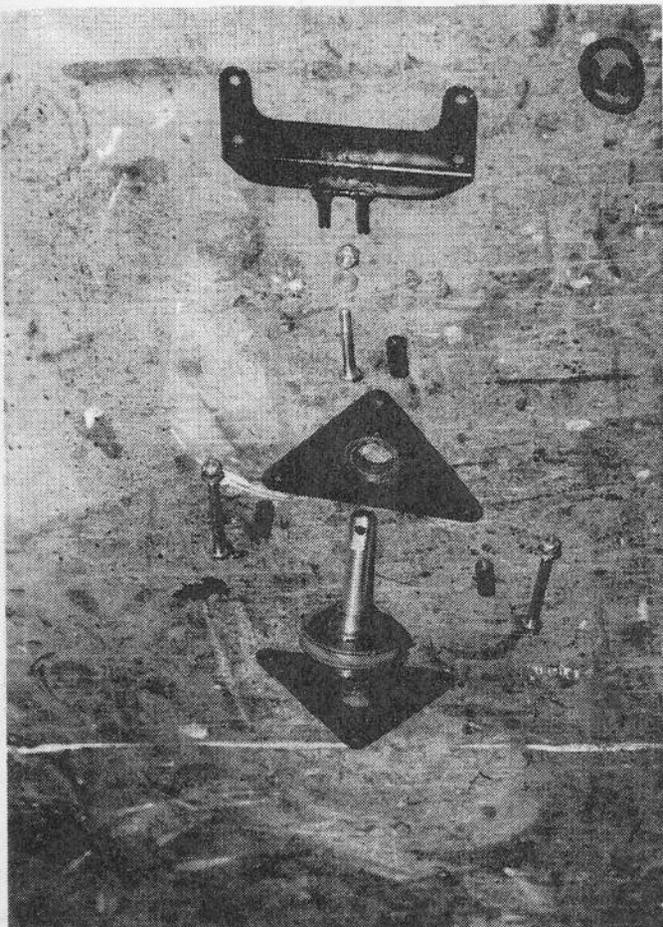
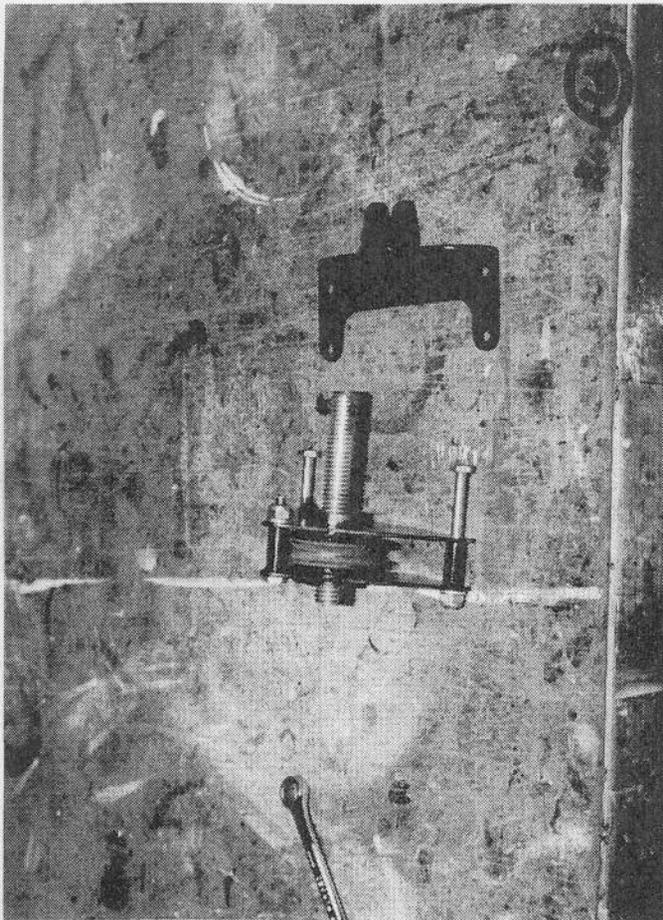


Photo 2 and a portion of the front cable lateral. Photo 3

Photo 1 shows how the cable is attached to the pulley. Photo 2



Handwritten notes on lined paper, including a diagram of a circular component with concentric circles and a central dot. The text is mirrored and includes "15-18475-5B" and "AG 001".

Handwritten notes on lined paper, including the words "Horizontal" and "Staircase" written upside down. There are also some faint, illegible markings.

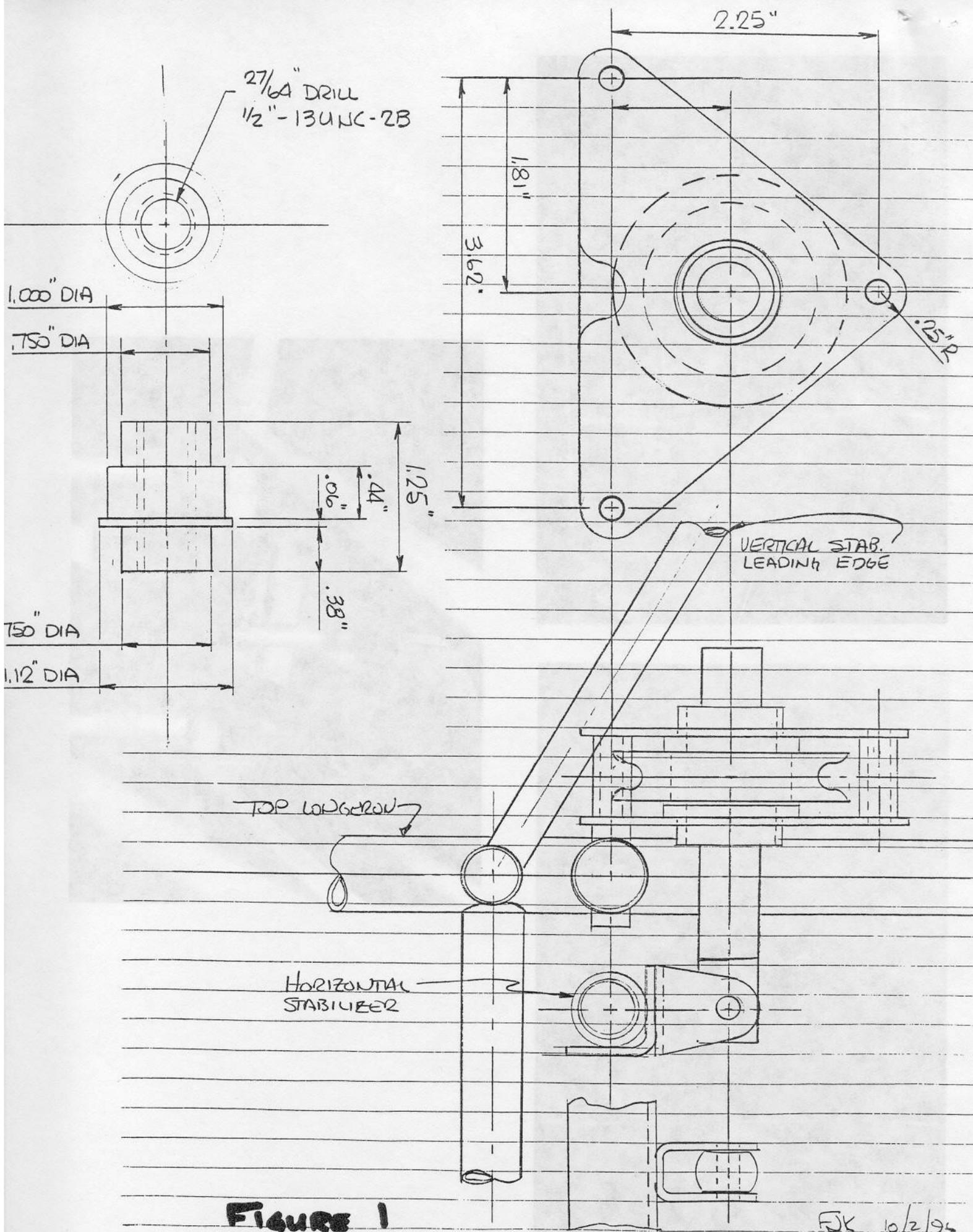


Figure 1

FJK 10/2/96

Want Ads

For Sale -- VW 1835 engine. All new. Hd. lifters, SCAT heads, Hapi access case w/ dual alt., elec. igniton, prop hub installed, Zenith carb. Might separate. Apart for inspection. Can assemble. Bob Stieg 815-397-1533 days 815-234-2283 eves.

For Sale -- Sonerai II midwing, Supervee cowling, Sterba prop, 2100 engine w/Revmaster prop ext. Also, 4016 Slick mag w/ 100 hrs, and misc. instruments. Eddie Eiland 1350 Thunderbrook De Soto, TX ph.214-230-8475

For Sale -- Porsche 914 2 liter engine project. Motor ran, mostly converted. 9" prop extension. Ellison carb. 650 Honda alt. Aluminum welded manifold. Potentially best VW conversion yet. Very cheap. Roger Durham 1370 Thompson Ave. Glendale, CA 91201 818-846-9163

For Sale -- 2 valve covers, 2 dual port int. man., 1 external oil cooler adapter, 1 oil cooler eliminator(bypass). All above are cast aluminum \$65.00 total. Also-- 4 exh. flanges, 2 steel "u" bends for exh. \$25.00 total. Also -- 1 dist.hole rubber plug \$5.00 Everything together \$85.00 210-899-4824 even. or 210-438-3154 week.

For Sale -- 1 Type 3 Supercase by Claudes Buggies, 1 forged crankshaft w/hub and prop extension, 2 cyl.heads w/ S.S.valves, 1 set of NPR piston rings. All for \$500. 217-935-5345 evenings

Wanted -- Son II project or completed aircraft. Preferred to have it 70-80% completed. Dave Valaer 2833 Summit St Souix City, IA 51104 712-277-2823

Wanted -- Variety of good used or new Sonerai parts: cowling, canopy, 5/8" landing gear, spinner, S wing kit. Also interested in a Son IIL project. Mike -- 219-534-2900

For Sale -- Sonerai IIL A&P built. Dual ign., hydraulic toe brakes, wing mod, much more AeroVee 2020 w/ 60 hrs. Russ Larson 406-857-3304

For Sale -- Sonerai I fuse. and flt. controls complete except cover. Wings complete and skinned 1600 VW rebuilt, SuperVee casting, spinner and prop, L. G., most every thing else. John Ricchio 847-413-4962 708-447-0448 eve.

For Sale -- 1990 Sonerai II L 2180 G.P. engine, Ellison carb, S-wing, Aux fuel tank, tinted canopy, white/red sunburst on wings and tail. 250 hrs+ Actively flying. \$10,000 Call Vic at 507-282-6647

For Sale -- Sonerai I Kit, welded fuse, wing kit, cowl, canopy, gear, wheels and brakes. \$2000.00 John Dialogue 801-571-3063

For Sale -- Sonerai II bubble canopy -- smoked brown, complete with latches, etc. \$300.00 (U.S.) 613-632-9601 home 514-437-6129 work

For Sale -- Sonerai II midwing fuselage, nice welding, controls, tailfeathers, spar box, gas tank, seats, on gear with 6X6 Azusa wheels, \$1000 or \$1250 w/ new Slick mag and harness. Might trade for Son I parts, other airplane parts or ? Harry Fenton wk: 815-965-4700

Wanted -- 5/8" landing gear for Sonerai II and also fuel tank Jerry Campbell 722 N. Main Aberdeen, SD 57401 605-225-8675

For Sale -- Sonerai IIL ,275 TT, 1834 HAPI, Aerobatic tested, light damage, must sell \$3750 309-944-2366 wkend

Wanted -- Sonerai engine, instruments, and airframe parts. Gene Cook 114 Imperial Ave. Friendswood, TX 77546

For Sale -- HAPI motor mt., Bosch starter, Alternator, 3" prop ext., Ignition switch, Tail wheel assy., taper pins, #8 pin reamer Greg Jannakos 994 Vineyard Circle Stone Mtn, GA 30083

For Sale -- Son IILT Fuselage approx. 85% complete. Sticks, rudder pedals in, tail feathers on. \$850.00 Bill Waters 770-466-2464

For Sale -- 1600 VW w/ SuperVee hub and oil filter. 156 hrs.TT 40 hrs since new top end \$900 Also Slick 4016 mag. 156 hrs for \$50.00 Nick Foudraine 902-755-1666

For Sale -- Sonerai II LT (easily conv. back to conventional gear) Wing Mod, VFR instr., Cleveland wheels and toe brakes.No engine or prop.

Ivan Haecker 8434 FM 2673 Canyon Lake, TX 78133 210-438-3354 weekend 210-899-4824 eve.

Wanted -- Sonerai prewelded or tacked fuselage with tail feathers. Also, landing gear kit.

Joe Burr 4098 Eddystone Dr. Cincinnati, OH 45251 317-827-7195

For Sale -- 2 Ray Jeff Lorans, Pl-99 w/ self contained battery packs, both w/ new chargers. \$175.00 ea. or both for \$300.00. In cartons w/ manuals. Mike 219-534-2900

Wanted -- Cont. A65 taper shaft prop hub and professionally welded fuselage for Sonerai (set up for Cont.) Also, I have Bendix mag rotors to correct the S-20 AD.

For Sale -- Cont. A75-8 300 SMOH John Mc Laughlin 25839 Tallwood Dr. North Olmsted, OH 44070 216-734-5578

For Sale -- Sonerai I project, Wings complete and ready for paint. Fuselage frame and tail completed and primed. \$1400 Can deliver Eastern US at cost. Jim Vliet 80 W. Jericho Turnpike #102 Syosset, NY 11791 516-364-457

For Sale -- Sonerai II LTS Wings assembled and ready for ailerons and tips. Prof. welded fuse. and tail feathers. On gear, cowling and fuel tank. \$5700 Paul Schmidt 412-458-5486

For Sale -- Revmaster 2100 D with prop, All acces. included, starter,alternator oil filter, carb, eng. mount. \$3975.00 Len 616-676-9711

Wanted -- Early style Monnett Super- Vee motor mount (not x-mount), 32mm Posa Supercarb w/ needles, AC 42 sparkplugs, broken tapered rod tailspring. Dave Patterson N 3280 Hwy 146 Fall River, WI 53932

For Sale -- Assembled wing spars w/ mod parts, nose rib blanks w/ holes cut. \$900 invested will sell for \$500.00 Frank Dwelley 860-653-7106

