88 sts total, decrease 8 times (11 sts per decrease section)

*(K9, k2tog), repeat to end of round
K1 round

*(K8, k2tog), repeat to end of round
K1 round

Repeat the above two rounds (1 decrease round, 1 k round) in the same manner above until you reach:
*(K1, t2tog), repeat to end of round

Then cut your yarn tail 12" long and thread your tail through remaining sts to cinch closed. Turn hat inside out and weave in tail on the inside.

Make a pom pom (see tutorial video) and attach to top of hat by threading the pom tails through center of the hat and securing the tails (tie a double knot with the tails and weave them into the hat)

FINAL EXAMINATION
HISTORY 182: SEX AND THE FAMILY IN AMERICA

The exam is due on **Thursday, December8th, by 4:30pm. NO LATE EXAMS WILL BE ACCEPTED BEYOND THIS DATE AND TIME.** Exams should be typed out, double spaced and stapled when turned in. Choose one questions from each of the two sections below. A properly answered question cannot be answered in any less than 6 pages for the first part, and 4 for the second part. While there is no upward limit, a well organized and well written answer should have no fewer than the minimum number. Please be sure to proofread and edit your paper, how you phrase your answer is as important as what you say in your answer.

Part One: Entire Course (55 points)

Your assignment is to write a carefully argued & intelligently written essay discussing the themes which form the foundation for a study in sexuality, the family, and gender roles throughout American history. These are themes of your choosing which are to be supported by utilizing the documents that you have been reading throughout the quarter. Your answer should consist of a discussion of those themes couched in the literature of the field. While you may use class lectures and notes to supplement your answers and provide the framework for the essay, the bulk of your evidentiary material should come from the class readings. Be sure to discuss these themes by referring to various works and authors specifically, not just in vague generalizations. This is not a recitation of every single source, but a careful choosing of themes, sources and information.

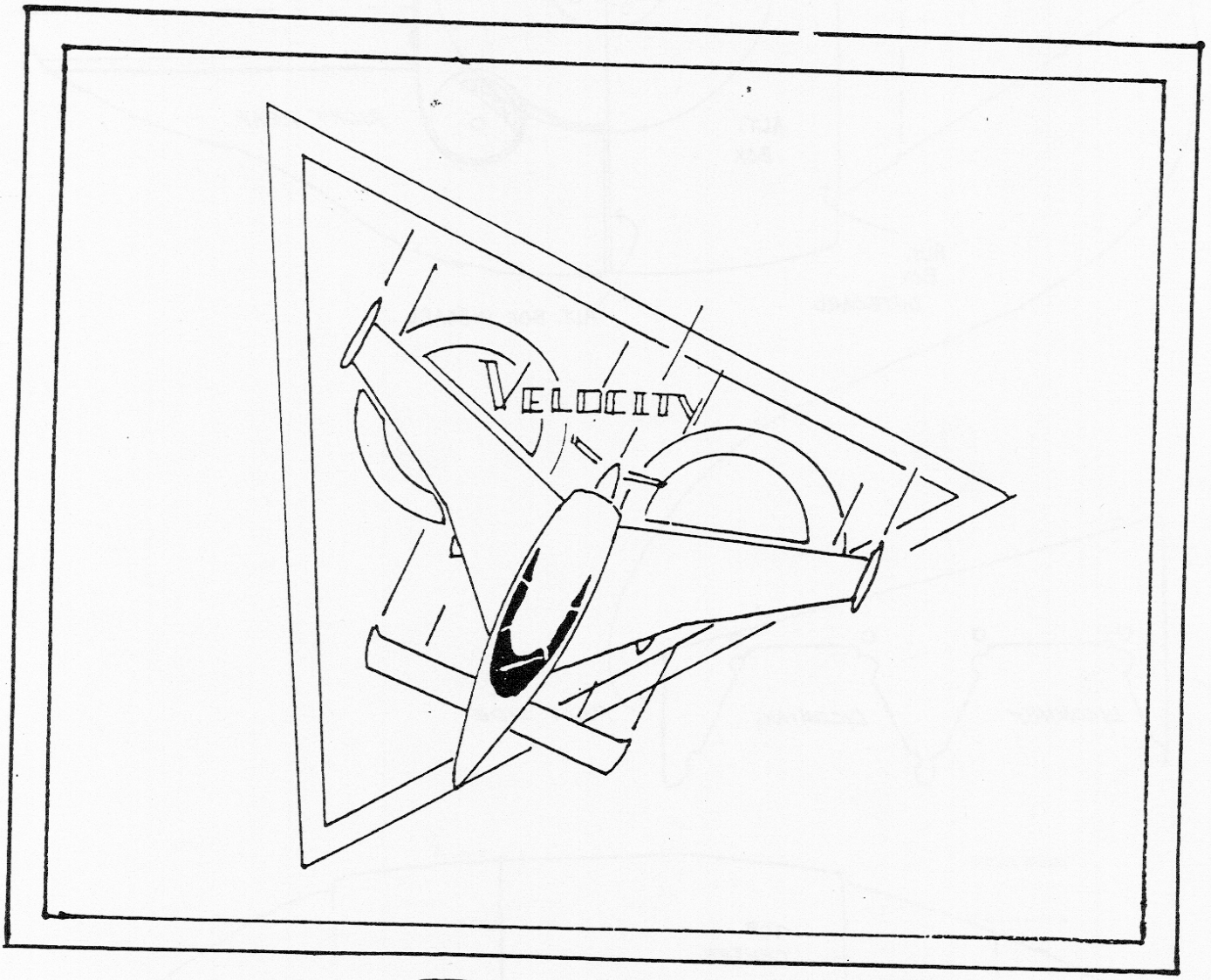
Part Two: Homeward Bound (20 points). Answer **one** of the following questions:

1. Describe and analyze the shifting attitudes, trends, and values that characterized gender roles and marriage in Twentieth century America (1930s–1960's). Be sure to discuss changes gender models, as well as the evolution of marital models during the same period. Be sure to utilize specifics from *Homeward* Bound, in your answer.
2. How were family models politicized in the twentieth century? How did the American family become a model/metaphor for the larger political and economic climate of the United States in the post-War period? Be sure to utilize specifics from *Homeward Bound* in your answer.

Part Three: Class Discussion/Lectures (25 Points). Answer **one** of the following questions:

1. Describe and analyze the shifting definitions and understandings of sexual "deviance" in late nineteenth and early twentieth century American society. Your answer should include, but be not limited to discussion of prostitution, the growing awareness of homosexuality, and alternate models of male and female sexuality. Be sure to utilize appropriate articles and class lectures for your answer.
2. How did ethnicity and/or race factor into family life and the formation of gender roles/identity in American city. Be sure to include discussions of both issues of race and ethnicity (and the challenges both faced in American society) and how those elements factored into marital patterns, gender identity, and even issues of deviance in the scope of American history. Be sure to utilize appropriate articles and class lectures to support your answer.
3. How has the place in which people lived played a role in the formation of family models in American history? How have cities, suburbs, or even colonies and slave plantations impacted the way family life and roles developed and functioned. Be sure to address a number of different geographic models/locals in your answer. Be sure to utilize appropriate articles and class lectures to support your answer.

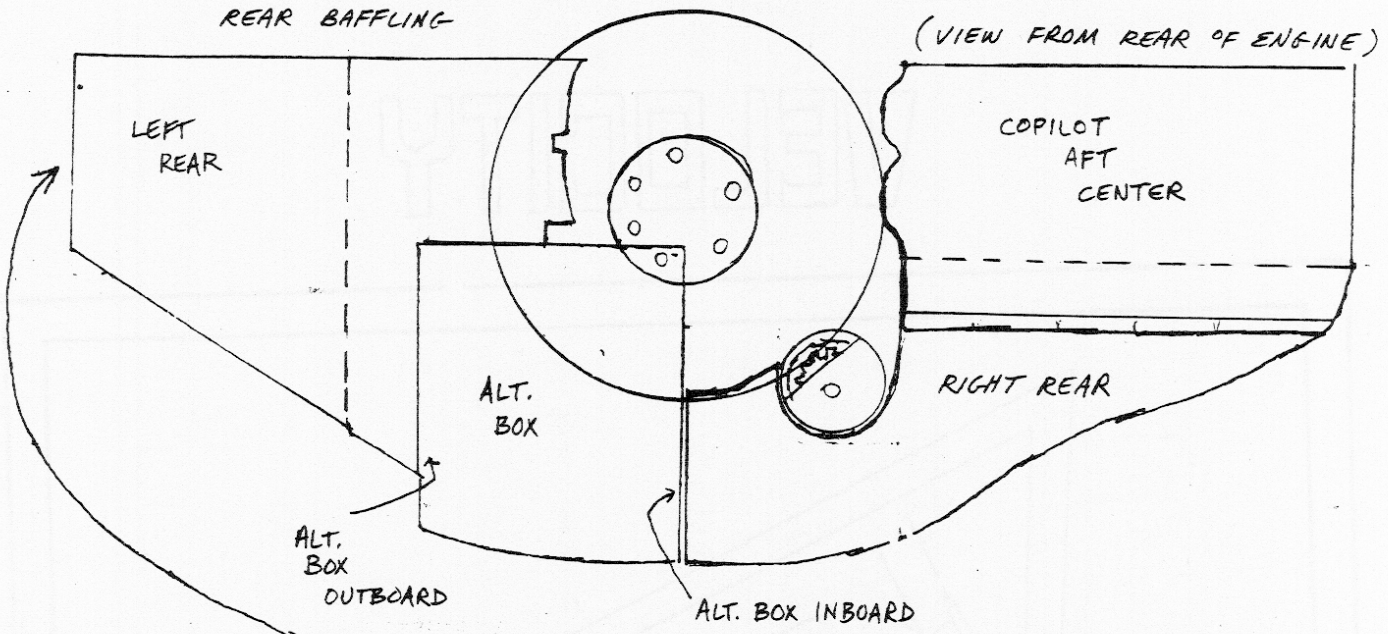
VELOCITY

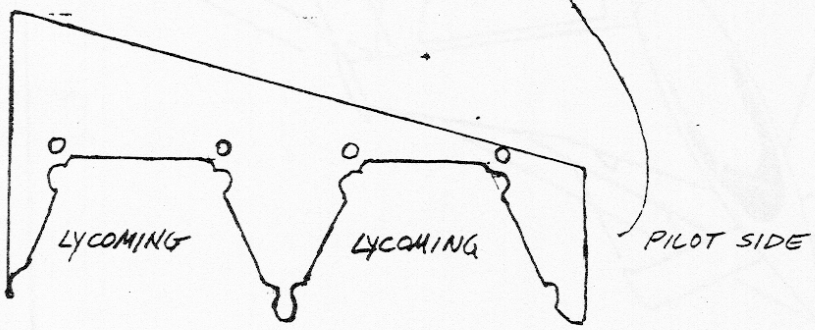


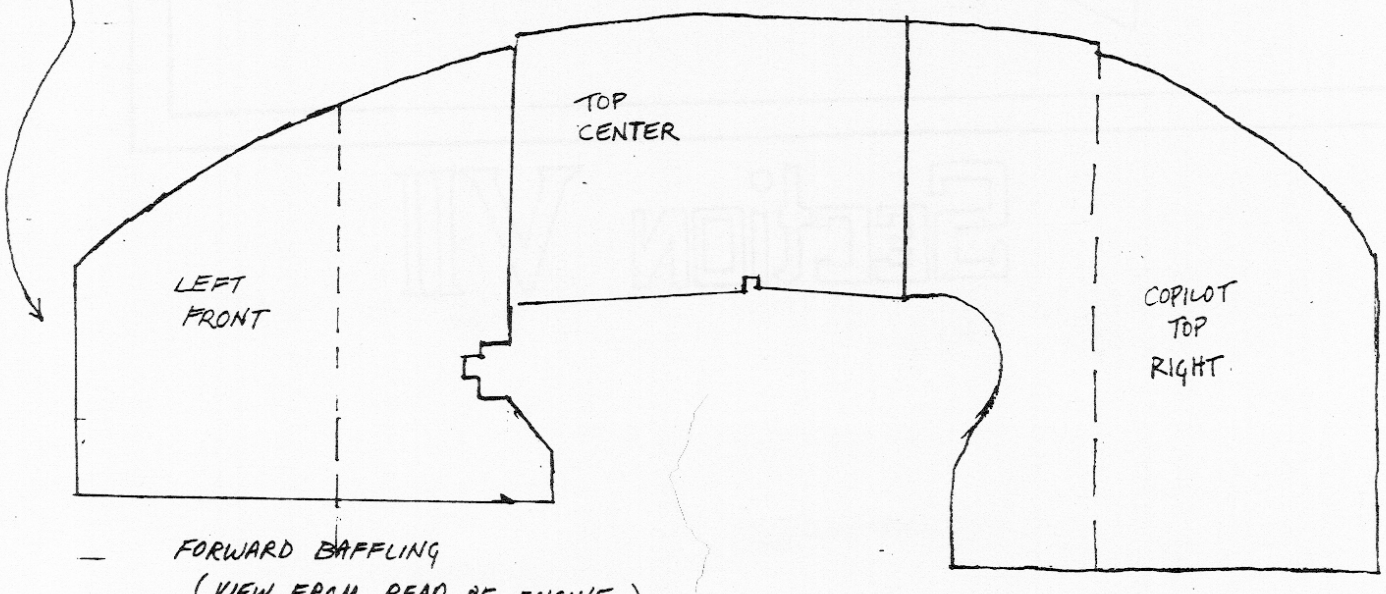
Section VII

engine baffling

200 HP LYCOMING







FORWARD BAFFLING
(VIEW FROM REAR OF ENGINE)

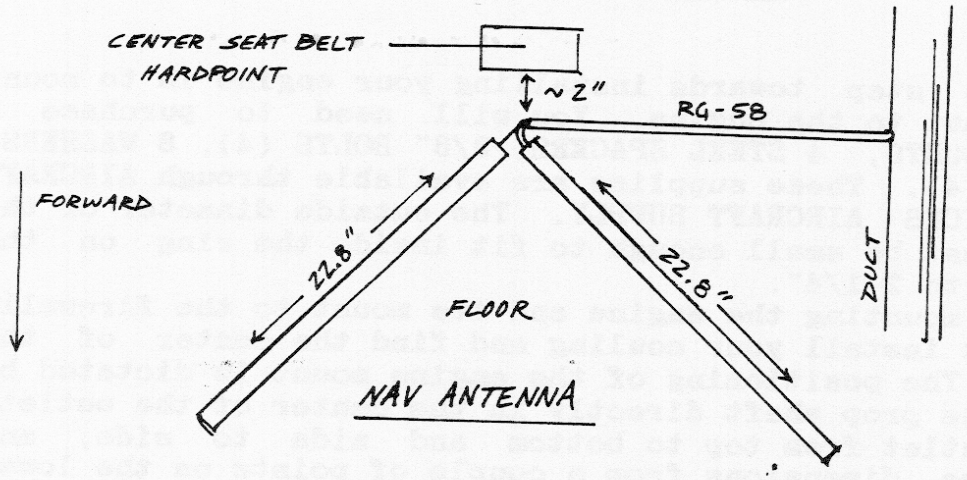
ENGINE INSTALLATION

The first step towards installing your engine is to mount the engine mount to the engine. You will need to purchase 8 RUBBER LORD MOUNTS, 4 STEEL SPACERS, 3/8" BOLTS (4), 8 WASHERS, and LOCKNUTS (4). These supplies are available through AIRCRAFT SPRUCE or WICKS AIRCRAFT SUPPLY. The outside diameter of the Lord Mounts must be small enough to fit inside the ring on the mount. 1-3/4" to 2-1/4".

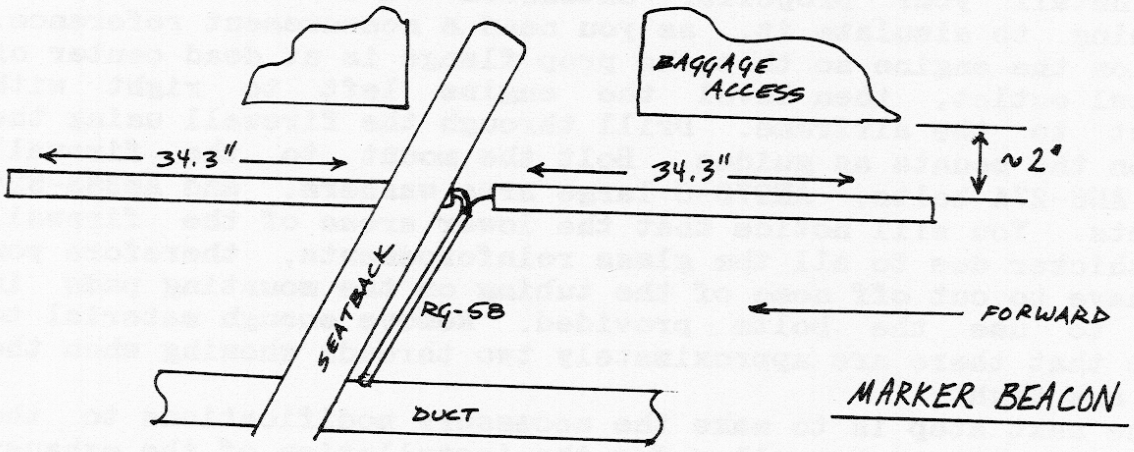
Prior to mounting the engine and its mount to the firewall, you must first install your cowling and find the center of the aft opening. The positioning of the engine mount is dictated by positioning the prop shaft directly in the center of the outlet. Measure the outlet from top to bottom and side to side, and establish some dimensions from a couple of points on the lower cowl lip. Locating of the engine is done with the lower cowl in position and the engine hung from above, or with the upper cowl in place and the engine supported from below.

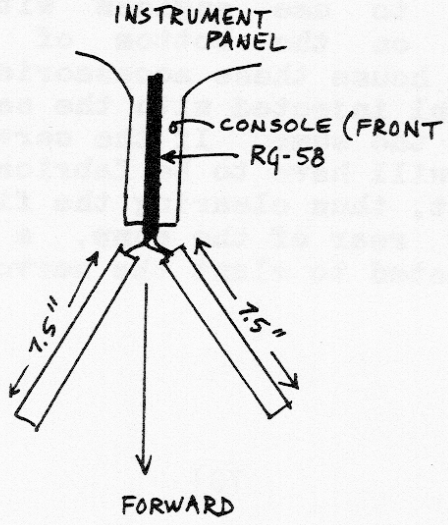
Install your propeller extension 6-8" or fabricate something to simulate it, as you need a measurement reference. Position the engine so that the prop flange is at dead center of the cowl outlet, then level the engine left to right with respect to the airframe. Drill through the firewall using the legs on the mounts as guides. Bolt the mount to the firewall with AN6-27A bolts, AN970-6 large area washers, and AN363-624 locknuts. You will notice that the lower areas of the firewall are thicker due to all the glass reinforcements, therefore you will have to cut off some of the tubing on the mounting pads in order to use the bolts provided. Remove enough material to insure that there are approximately two threads showing when the bolts are tight.

The next step is to make the necessary modifications to the induction system to allow for the installation of the exhaust headers and lower cowl. Most 160-180 HP Lycomings do not need modification of the intake tube, however, the 200 HP Lycoming does. There are many different versions of the four cylinder Lycomings, and the majority of the differences are in the intake systems. So, rather than design the Velocity around one particular engine, we decided to modify the engines to fit the VELOCITY. There are a couple of things that won't fit into the VELOCITY, such as accessory-mounted oil filters and single mag engines. In order to use engines with a fuel servo or carburetors mounted on the bottom of the sump, you must fabricate a bump to house these accessories. All installations to date have been fuel injected with the servo mounted either on the front or rear of the sump. If the servo is on the front of the sump, an elbow will have to be fabricated to turn the servo down and to the right, thus clearing the firewall. If the servo is located on the rear of the sump, a shim of approximately 5/16" must be fabricated to slant the servo slightly upward to clear the cowl.



COVER RG-58 + COPPER STRIPS WITH 1 PLY FINE BID





GLIDE SLOPE

ANTENNA INSTALLATION

There have been many theories concerning optimum antenna installation in composite aircraft, and many articles and books published about these theories. I would be willing to bet that some of these articles were written by engineers that have never been close to a composite aircraft. We will tell you how we installed our antennas, with which we have had great success, and it is up to you whether you wish to follow our recommendations.

We use simple dipole antennas that consist of two copper strips (or wire) of equal length. One strip is attached to the core of an RG-58 cable, while the other half is connected to the sheath and runs in the opposite direction. All of our antennas are in the fuselage with the exception of the com antenna, which is located in the winglet.

COM ANTENNA

Done prior to glassing.

When you built your winglet, you installed the cable, which should now be accessible through the rudder closeout. Go in and get the end of the cable, then strip it back approximately 3/4". Next, get two pieces of copper foil tape exactly 20.3" long, and run one up one side of the closeout area. Run the other down the same side, leaving the ends of the two tape strips no more than 1/2" apart. Put a couple of ferrite torroids around the cable just in front of the antenna, and solder the center lead to the top copper strip.Solder the shield to the lower strip. Cover with one ply FINE BID.

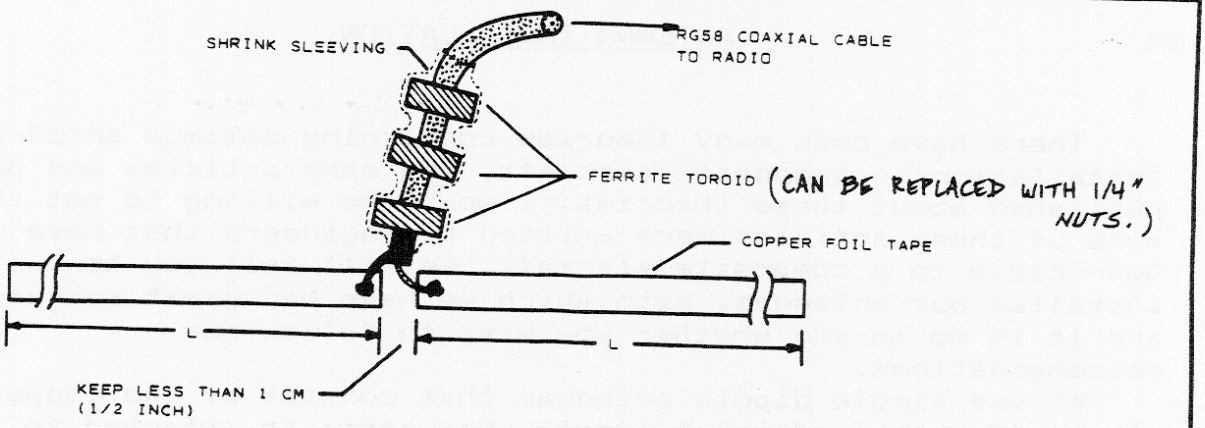
NAV ANTENNA

We found that the Nav Antenna works well and fits perfectly on the floor under the rear seat in the shape of a "V". Take two pieces of copper tape, 22.8" long, and form a "V" centering a couple of inches in front of the center seat-belt pads. The angle of intersection should be approximately 150 degrees, and the intersecting ends should be no more than 1/2" apart. Run your RG-58 cable down the pilot's side duct, and solder the center lead to one copper strip, and the shield to the other. Cover with one ply of fine bid.

The GLIDE SLOPE ANTENNA is about the same as the COM ANT., except that the strips are 7.5" long, and located on the floor in front of the console. Run your cable up the front of the console, and cover with fine bid.

MARKER BEACON

The marker beacon is a very long antenna, and it fits well a couple of inches below the baggage access (Co-pilots's side) running fore and aft. No "v" is necessary. The strips are 34.3" long, one running through and forward of the seat bulkhead, and the other running from the bulkhead aft. Put your RG-58 cable



(CAN BE REPLACED WITH 1/4" NUTS.)

	L (INCHES)
COM	20.3
NAV	22.8
MKR	34.3
G/S	7.5

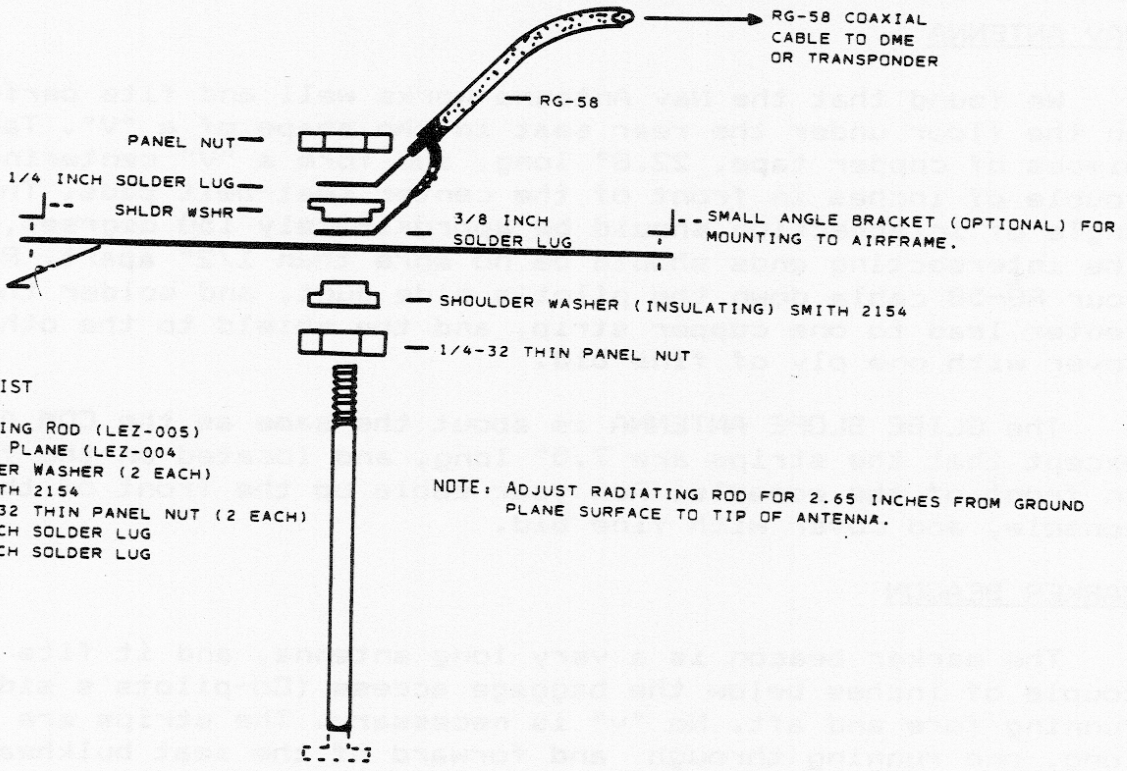
X2 = 40.6 X2 = 81.2 , (2 com Ant)

45.6 X1

68.6 X1

15.0 X1

210.4" Total



PARTS LIST

RADIATING ROD (LEZ-005)
GROUND PLANE (LEZ-004
SHOULDER WASHER (2 EACH)
SMITH 2154
1/4 - 32 THIN PANEL NUT (2 EACH)
3/8 INCH SOLDER LUG
1/4 INCH SOLDER LUG

NOTE: ADJUST RADIATING ROD FOR 2.65 INCHES FROM GROUND PLANE SURFACE TO TIP OF ANTENNA.

down the Co-pilot duct and up the seat bulkhead. Tie into the antenna just aft of the seat bulkhead. Cover with fine bid.

TRANSPONDER

We use the antenna supplied with the transponder, but we must use a thin sheet of aluminum (approximately 7" X 7") bolted to the back as a ground plane. This antenna is installed in the compartment just outboard of the fuel tank in the strakes, just forward of the outboard wing attach bolts. The antenna is simply held in place with microglass. The antenna is located within the cavity, and does not protrude outside the aircraft skin.

LORAN

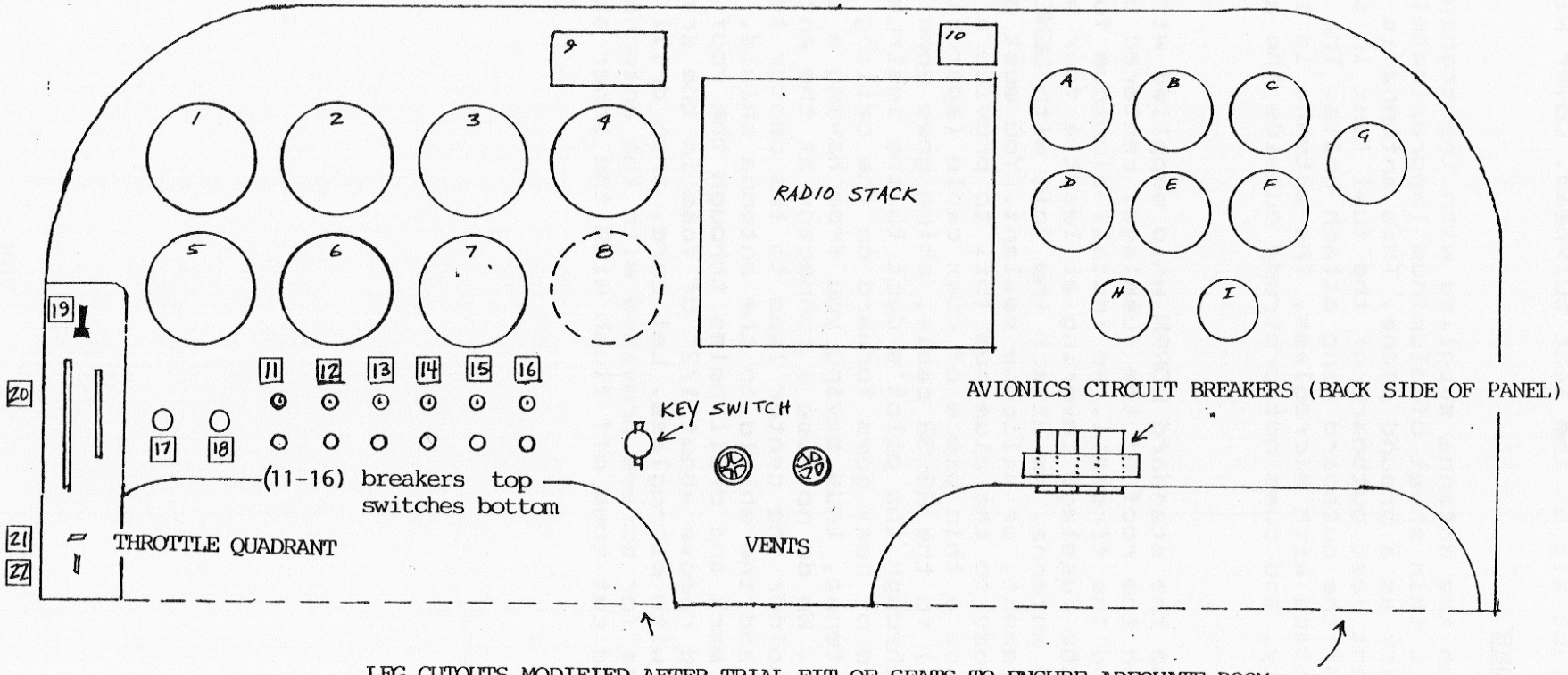
We use the standard LORAN whip supplied with the LORAN sets, mounted on the roof of the fuselage, centered between the door cutout and the firewall. We install aluminum foil to the inner skin of the fuselage covering at least a four square foot area below the antenna. We attach the foil with GENEMID EPOXY, contact cement, or silicone sealant. You must ground your antenna body to the aluminum foil to provide a ground plane. We also splice a thin piece of coax cable (approximately 1/8" diameter) to the RG-58 cable, which goes down the firewall and forward through the pilot's duct to the instrument panel. The thin piece of coax goes forward on the ceiling from the firewall to the antenna, thus saving you from having a large bump in your headliner. We do not use a connector at the antenna end, but instead solder the center lead to the center terminal of the antenna, and the shield to the antenna shield. To mount the antenna, mark and drill holes through the roof of the AC, go inside and remove about 1/2" of foam in the area of the holes and fill with microglass. Let cure, then drill and tap microglass for screws provided with the antenna. Install the screws and cut them off flush with the inner skin.

1 - AIRSPEED INDICATED
2 - ALTIMETER
3 - DG
4 - VOR
5 - VERTICAL SPEED
6 - TURN COORDINATOR
7 - ARTIFICIAL HORIZON
8 - TACH (OPTIONAL)

9 - MARKER BEACON
10 - DIGITAL TACHOMETER
11) NAV LIGHTS
12) STROBES
13) FUEL PUMP
14) INSTRUMENTS
15) COCKPIT LIGHTS
16) SPARE
17) AVIONICS MASTER
18) ACCESSORY MASTER

19) SPEED BRAKE SWITCH
20) THROTTLE
21) PITCH TRIM
22) ROLL TRIM

A - OIL PRESSURE
B - AMMETER
C - CLOCK
D - OIL TEMP
E - VOLTAGE
F - HOUR METER
G - FUEL FLOW
H - MANIFOLD PRESSURE
I - CHT



LEG CUTOUTS MODIFIED AFTER TRIAL FIT OF SEATS TO ENSURE ADEQUATE ROOM

This is a diagram of a typical VELOCITY panel, taken from one of our aircraft. This is merely a suggestion, and you can set your own panel up however you would like.

INSTRUMENT PANEL

SEE SKETCH OPPOSITE PAGE

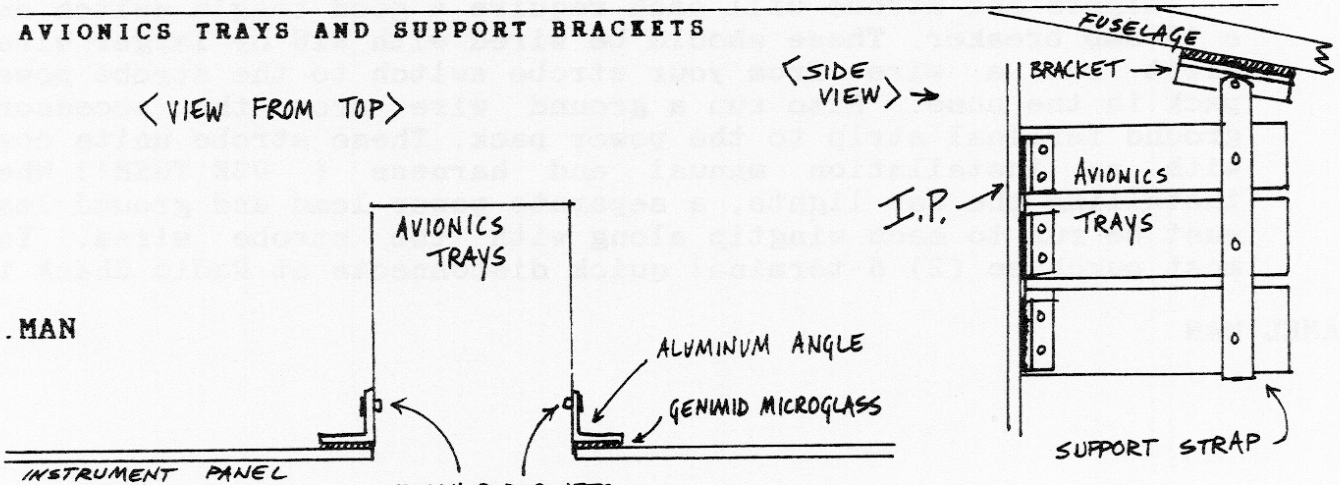
The instrument panel in the drawing is that of the aircraft built in the video tapes. The layout, again, is only suggestive. Instrument panels, interiors, and paint jobs are strictly matters of personal preference. But keep in mind that there are a couple of factors that dictate panel layout. First of all, the upper few inches are limited in depth due to the fuselage contour forward of the windshield. The control system is in the center below the panel, and the elevator torque tubes move back toward the panel in the aft stick position.

The fiberglass I.P. is a structural part of the airframe, so removing too much of it could prove detrimental to structural integrity. Also, replacing the panel with aluminum is not a good idea. We suggest that you finish your panel face out either with paint or formica glued on with contact cement.

Prior to doing any work on the panel, construct a cardboard mock-up of your panel, then transfer locations and dimensions to the actual panel once you are satisfied with your layout. You will also find that working with a fiberglass instrument panel is a lot easier than working with a metal one, and that boo-boo's can be repaired easily with fiberglass and filler. When mounting your flight instruments, you will need a 3-1/8" holesaw, and you will need either a 2" or 2-1/4" hole saw for your engine instruments. Cutting for the radio stack can be done with a sabre saw and a flat file. Smaller holes can be drilled and then altered with a rat-tail file to fit switches, breakers, etc.. Flight instruments are to be mounted with 6-24 instrument screws. BE CAREFUL: TOO LONG A SCREW CAN DAMAGE INSTRUMENTS! Breakers, switches, and ignition switch are installed with lock nuts provided with the switches. We install the engine instruments with silicone sealant (no screws). We have had excellent luck this way. We also install our air vents and manifold to the back of the panel with silicone sealant.

In the installation of the avionics package, we bond 2 pieces of 1 X 1 X 1/8 aluminum angle to the back of the panel with genemid microglass. Sand aluminum and panel back first, and then install to back of panel on both sides of the avionics cutout so that the trays for your avionics will fit between the legs of the angles. Once the microglass has cured, install your trays with flush head pop rivets to the legs of the angles. It is advisable to support the back of your avionics by attaching to a small bracket microglassed to the inner skin of the fuselage above the rear of your avionics package.

AVIONICS TRAYS AND SUPPORT BRACKETS



When installing switches and breakers, bring the power leads directly to your master breaker (accessory - avionics) then come off the master breaker to the appropriate breakers and switches. We suggest that you cut all the holes, trial fit your flight instruments, and then remove them while wiring your switches and breakers. This allows more access when you have to solder leads. We solder all joints, even the crimp on terminals, as they tend to come loose.

First, permanently install the two master breakers. Bring power to these from the battery with two #10 wires. Go from the master accessory 40 amp breaker to all the accessory breakers with one length of #10 wire, traveling from one breaker to another, then from each breaker to the corresponding switch with #16 wire. We put the switches on the bottom, below the breakers and above the leg cutouts for accessability, then from the switch to the accessory (lights, strobe, fuel pump, etc.) with #14 wire. The next step is to take the power from the avionics master breaker to the individual avionics breakers with a piece of #12 wire. These small breakers should be mounted on a small piece of aluminum microglassed to the back of the IP just above the copilot leg cutout, so that when the breakers are tripped, they protrude down just a little. From these breakers, wire to the appropriate avionics with #16 wire. There is no need for individual switches on the avionics.

After installing your accessory switches, breakers, and avionics breakers, we suggest that you wire your engine instruments. Install these instruments with screws, clamps, or silicone sealant, and ground them to your accessory ground terminal strip with #16 wire. Then, wire them and your electric turn coordinator to an accessory switch labeled "Engine Inst." with #16 wire. These can be wired with one wire going from instrument to instrument. This switch should be controlled by a 3 amp breaker. Next, connect the sender terminal of the instruments to the appropriate engine senders, utilizing #20-#22 wire down through the copilot duct. If you are using a solid state engine analyzer, or a solid state temperature monitoring instrument, use wire harness, diagram, and circuit breaker or fuse recommended by the manufacturer. In the case of using the Westach instruments, you will have to run two leads from the instrument to each probe. These people provide excellent wiring diagrams, but they can also be very confusing. If you have any doubts, get assistance or check with a voltmeter prior to throwing the switch.

Lights and strobe will each require a good toggle switch and a 10 amp breaker. These should be wired with #16 or larger wire. First run a wire from your strobe switch to the strobe power pack in the nose. Also run a ground wire from the accessory ground terminal strip to the power pack. These strobe units come with an installation manual and harness (USE THEM!) When installing the Nav lights, a separate power lead and ground lead must be run to each wingtip along with the strobe wires. You must purchase (2) 6-terminal quick disconnects at Radio Shack to

install in the center section spar so that these wires can be easily disconnected when the wings are removed. Run all light and strobe wires through the copilot duct.

When wiring fuel pump and fuel flow, hook up fuel pump with #16 or heavier wire to switch with a 10 amp breaker. Ground to accessory terminal strip. The wiring of the fuel flow meter will differ according to manufacturer, so use the manual provided.

In the area of cockpit lighting, there are several ways to go. One is to utilize individually lighted instruments (extremely expensive), use small lights in the glare shield, or install a couple of small cockpit lights in the baggage recesses and aim them at the instrument panel. The latter is the easiest way to go. They work great, and can double as map lights.

Next pull off your master breaker with a #14 wire directly to the terminal marked battery of your ignition switch. You must also wire your ignition switch to the accessory ground with #14 wire from the ground terminal on the switch to the ground terminal strip. At this time, it is advisable to ground the shields on your P-leads to this terminal. It is also a good time to wire your P-leads and starter circuit. Remember, different mags get different wiring circuits, so consult the diagram for engine and mags being used. A little help from an AP couldn't hurt.

SPEED BRAKE WARNING CIRCUIT

These parts can be purchased from Radio Shack. All that you need is a normally closed micro switch and a small red 12 volt indicator light. This circuit consists of a piece of #22 wire starting at your master breaker and leading to an indicator light OBVIOUSLY located on your IP. The wire then runs from the other lead on the light to the micro switch mounted through the floor of your fuselage just behind the seat bulkhead, so that when the speed brake is extended, the switch closes. The other terminal of the micro switch is connected to the accessory ground terminal strip. This micro switch can be held in place with silicone sealant on a small bracket that is out of the passenger's way. It must be suspended so that the trigger of the micro switch comes in contact with the speed brake when retracted, thus opening the circuit and turning the warning light off.

This is an area where it becomes purely a matter of personal choice. The Westach units have been around for awhile, they are inexpensive and widely used. We have had fair success with them when installed properly, and a wiring diagram is supplied with each instrument. Westach offers EGT - CHT guages which are a must for initial flight testing. In the area of temperature monitoring, we are partial to the JP Instruments Scanner. It is quite expensive, but well worth the money. There are other solid state instruments on the market, but we have had no experience with them, so we cannot vouch for their credibility. We at VELOCITY prefer using automotive or marine type Analog Engine instruments, as they are inexpensive and quite accurate if you use a name brand such as Rochester or Stewart-Warner. You will need an oil temp, oil pressure, tachometer(we are experimenting with the Brail Digital Unit), ammeter, voltmeter, hourmeter, and temperature monitoring EGT-CHT. Clock and fuel flow meter are optional. We supply the power off the master circuit breaker switch through a 3 AMP circuit breaker and a separate switch to supply power for the engine instruments. We also supply power to the electric turn-and-bank through this circuit. We have found that these instruments generate noise that will affect your avionics if wired through the avionics breaker. It has been our experience that putting the avionics on a separate lead both (+) and (-) originating at the battery will give you the best results. Do not pull any power for accessories off the avionics breaker, only the master breaker. As far as avionics go, we have had the best luck shopping through TRADE-A-PLANE magazine, which is also where we track down most of our flight instruments. Any way you look at it, these are expensive, but there are still bargains to be found if you look hard enough. Regarding switches and circuit breakers, the RADIO SHACK variety don't hold up. These should be purchased through an aircraft supply house such as WICKS aircraft.

SWITCHES & BREAKERS

1) Alternator breaker suitable for alternator used
PAGE 223 - AIRCRAFT SPRUCE - FIG 548

1) Master accessory	Aprox 40 AMP breaker - typ
1) Avionics master	Aprox 30 AMP breaker - typ

APROX. 6 SMALL 10 AMP SWITCHES

1) Fuel pump	10 amp breaker
1) Nav lights	10 amp breaker
1) Strobe	10 amp breaker
1) Instrument	3 amp breaker
1) Cockpit lights	3 amp breaker
1) Spare	(landing lights, etc)

1) 10 amp breaker for speed brake and trim system
1) Push to talk, normally open, mounted on top of stick

Every accessory comes off the master breaker switch, through the appropriate circuit breaker, and then is connected to to the accessory by an ON/OFF type toggle switch.

AVIONICS

We strongly recommend that you get a professional or someone with experience to wire these and label the leads that are to be supplied power or ground accordingly. It is important to use the proper circuit breaker for each unit. We install these breakers vertically behind the panel above the copilot's legs on a piece of aluminum microglassed to the back side of the panel. They are set in such a position so that if one is tripped, it will protrude slightly below the passenger leg cutout. Be sure to check with manufacturers or representatives for proper wire sizes and circuit breaker capacity. WIRE ALL AVIONICS THROUGH THE AVIONICS MASTER BREAKER.

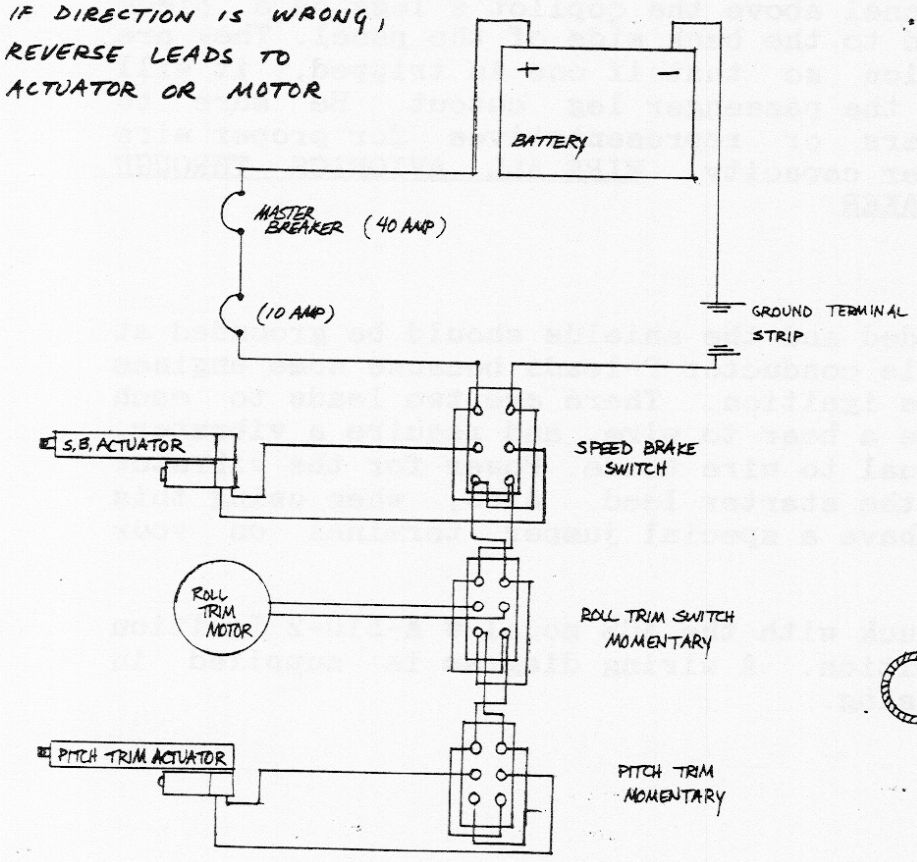
P-LEADS

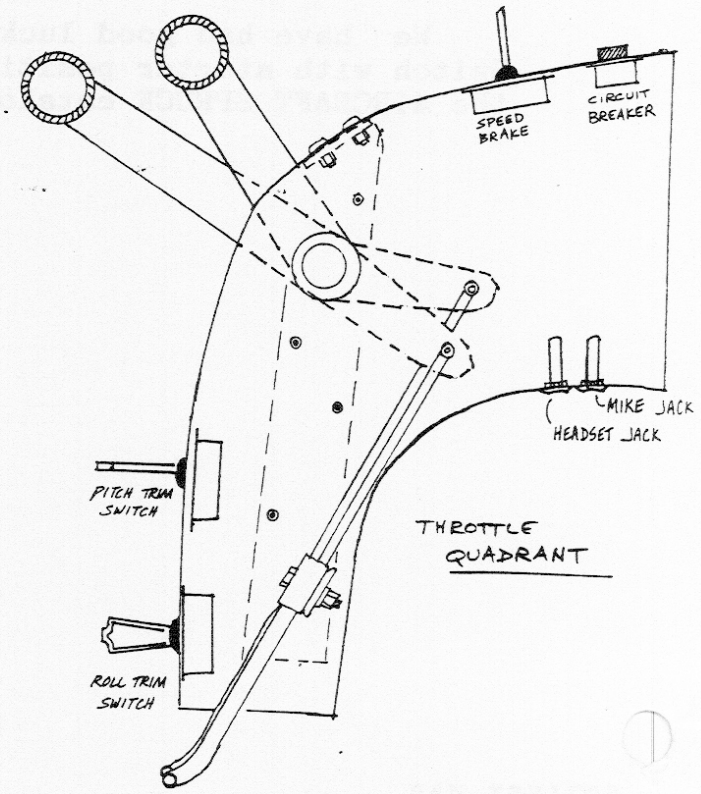
These must be shielded and the shields should be grounded at both ends. We run double conductor P-leads because some engines utilize shower of sparks ignition. There are two leads to each mag. These type mags are a bear to wire, and require a vibrator. Refer to a Lycoming manual to wire these. Power for the vibrator can be supplied from the starter lead. Also, when using this type of mag, you must have a special jumper terminal on your ignition switch.

We have had good luck with the ACS model # A-510-2 Ignition Switch with starter position. A wiring diagram is supplied in the AIRCRAFT SPRUCE catalog.

Power for trim and speed brake is pulled directly from the master breaker to a 10 amp circuit breaker, then through appropriate switches located in the throttle quadrant console. The wiring diagram for this is a bit confusing because we switch the direction of the motors by reversing the current supplied. We also mount the mike and headset jacks in the bottom of the throttle quadrant.

TRIM - SPEED BRAKE





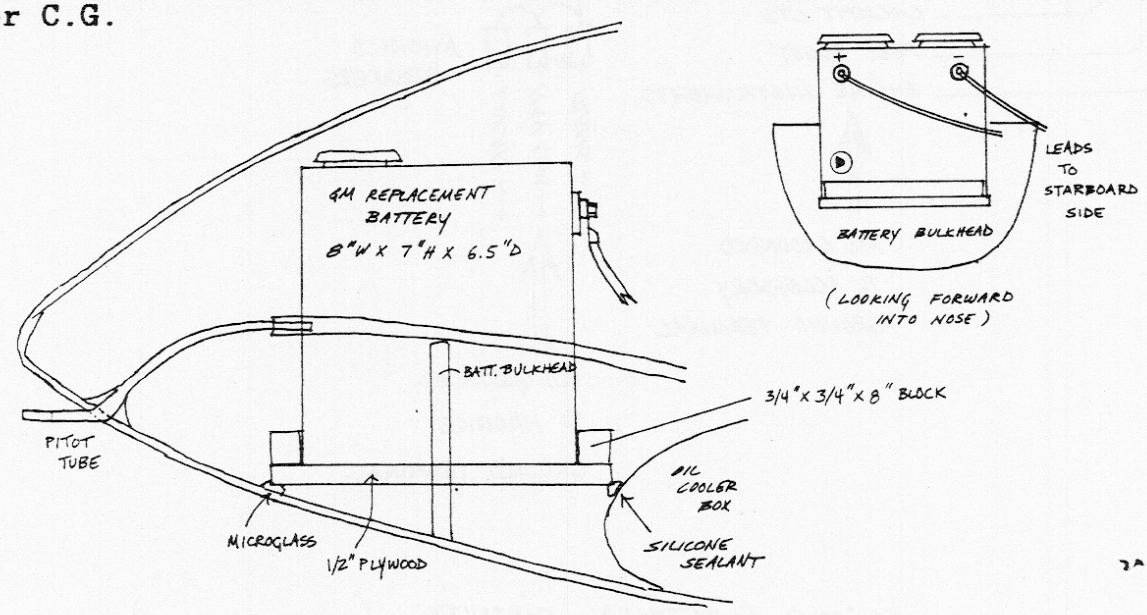
****
NOTE: BEFORE STARTING THIS SECTION, ORDER AN AIRCRAFT SPRUCE CATALOG, EVEN IF YOU DON'T PURCHASE ANYTHING FROM THEM. IT HAS A WORLD OF INFORMATION INSIDE THAT YOU MIGHT FIND USEFUL. ORDER PARTS FROM THEM EARLY, AS THEY SPECIALIZE IN BACKORDERS. PHONE NUMBER: 1-800-824-1930
****

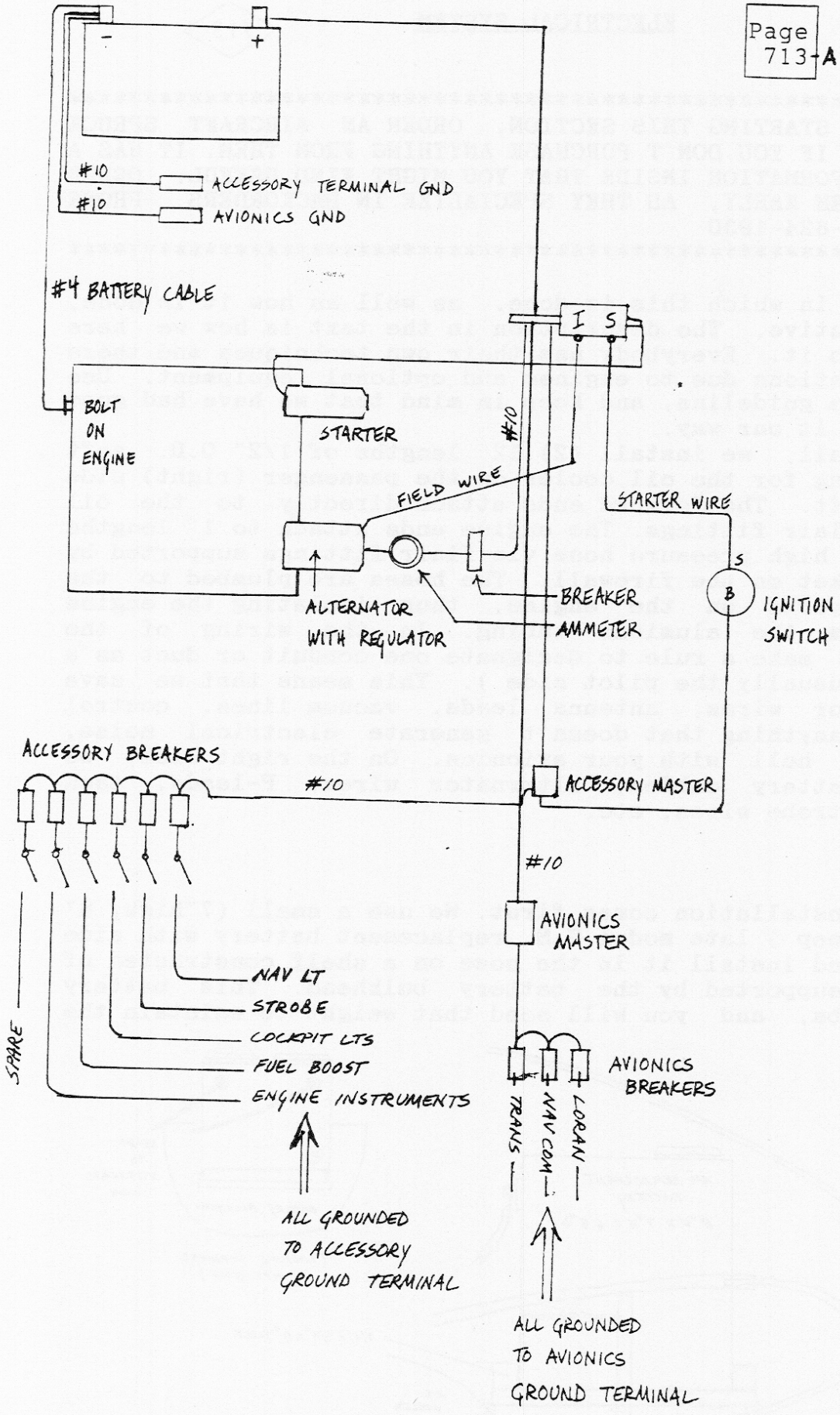
The order in which this is done, as well as how it is done, is only suggestive. The description in the text is how we here at VELOCITY do it. Everybody has their own techniques and there are many variations due to engines and optional equipment. Use this text as a guideline, and keep in mind that we have had good success doing it our way.

First of all, we install (2) 12' lengths of 1/2" O.D. soft aluminum tubing for the oil cooler on the passenger (right) side of the aircraft. The forward ends attach directly to the oil cooler, via flair fittings. The engine ends attach to 1' lengths (approx.) of high pressure hose via flair fittings supported by an angle bracket on the firewall. The hoses are plumbed to the appropriate ports on the engine, thus isolating the engine vibration from the aluminum tubing. In the wiring of the VELOCITY, we make a rule to designate one conduit or duct as a quiet duct (usually the pilot side). This means that we save this duct for wires, antenna leads, vacuum lines, control cables, and anything that doesn't generate electrical noise, thus raising hell with your avionics. On the right side, we install the battery cables, alternator wires, P-leads, tach senderwire, strobe wires, etc.

ELECTRICAL

Battery installation comes first. We use a small (7"high, 8" wide, 6-1/2"deep) late model G.M. replacement battery with side terminals, and install it in the nose on a shelf constructed of 1/2" plywood supported by the battery bulkhead. This battery weighs 33 lbs, and you will need that weight to maintain the proper C.G.



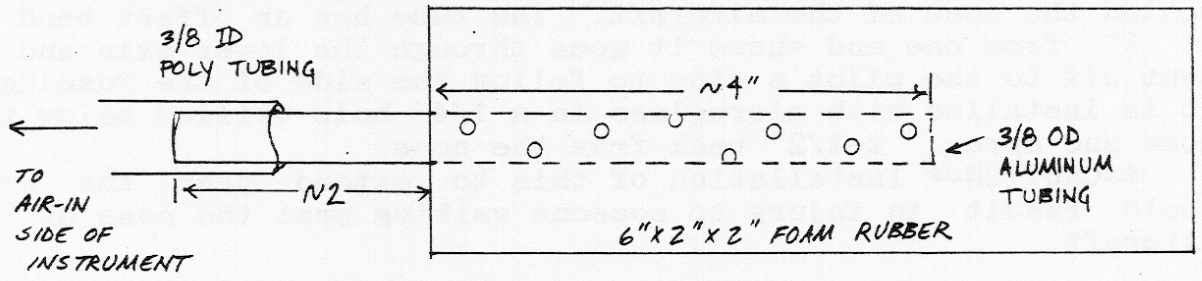


ENGINE ELECTRICAL CIRCUITS (.)

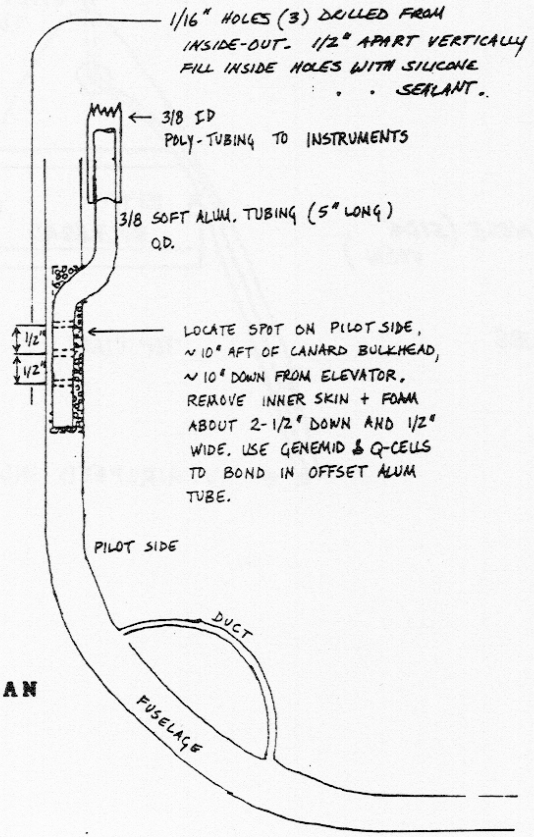
Now you need approx. 29´ of #4 battery cable, and (6) #4 X 3/8 solder on terminals, both available at a local auto parts store. The ground lead is 13´and runs directly from the negative terminal of the battery to a bolt on the engine sump, via the right duct. When you are installing the terminal to the battery end of the cable, attach (2) 6´ lengths of #10 wire to the terminal, one for avionics, the other for accessories. Run these two wires, along with the ground cable, into the right duct, and exiting the duct about 1´ aft of the canard bulkhead. Bring them up the side of the aircraft and hook to two terminal strips microglassed to the inner, side, skin of the aircraft several inches forward of the instrument panel. Again, one is for avionics, the other for accessories. To install the (+) battery cable, you will need a length of 3´ cable, and a length of 12´6" cable, each with terminals soldered on the ends. Mount the starter solenoid on the forward side of the canard bulkhead just above and inside of the right duct. The 3´ length of cable runs from the (+) terminal of the battery to the solenoid, and the 12-1/2´ length runs from the solenoid to the starter. We use a Ford type 12V starter solenoid with an ignition terminal and a start terminal. In order to operate, the solenoid body must be grounded. The start terminal is hooked to the start terminal on the ignition switch. The ignition terminal is used to excite the field in the alternator. Now, we run (2) #10 (red) wires from the (+) terminal down and along the right duct, exiting the top of the duct with the ground wires, and up the side of the fuselage, across the back of the panel to the master breaker switches. We use a 40 AMP breaker for accessories, and a 30 AMP breaker for avionics. We use the breaker-switch combination available from the aircraft supply houses. From the battery terminal side of the starter solenoid, run a #10 wire back to the B+ side of the alternator. It is advisable to install a circuit breaker in this line that is large enough to handle the alternator you are using. If your ammeter guage is not shunted, this wire must be installed to the guage. If not, a shunt will be installed in this line and wired to the guage. In all our installations, we have used a 35 AMP alternator, complete with a built-in voltage regulator, manufactured by Motorola. This alternator sells for about $150.00 new, and adapts well to the Lycoming engine. A small mounting bracket must be made out of 3/8" aluminum or steel angle to mount it to the existing Lycoming mounting holes. This should complete all the electrical wiring that is to be done in the nose of the aircraft. The only other thing that goes there is the strobe power pack. This is a Whaleen model #A413A, HDA, DF. This is mounted to a piece of 3/8" plywood microglassed to the inner skin of the right fuselage side wherever you find ample room. The power pack is used in conjunction with A600-PG/PR wingtip position strobe lights. These units have position nav-light as part of the system. We advise you to use the HD60 installation kit with this unit. A suitable wiring diagram is supplied by the manufacturer with purchase. This unit will satisfy all lighting needs in the VELOCITY. As for landing lights, we have not yet installed one

in a VELOCITY, though many builders have suggested different ways of doing so. When we see one that is suitable for the aircraft, we will pass the information on to you. We do not recommend anything that we have not tried ourselves.

Most Lycomings come with vacuum pumps. In the VELOCITY, you will probably have only two vaccum-operated instruments, so the use of 1/2" O.D. flexible PVC hose is adequate. This material is somewhat hard so that it won't collapse, and you will need approximately 20' of it to go from the vacuum pump through the pilot duct to the front of the canard bulkhead, where we locate the vacuum regulator. This PVC tubing can be purchased at ACE HARDWARE STORES along with all the other supplies for your Pitot Static plumbing. We use PVC Hi-temp "L's" at the vacuum pump, and install the PVC hose to the "L's" and regulator with silicone sealant. We usually leave the regulator unsupported beneath the brake cylinders. From the regulator to the instruments, we run a 3/8" (ID)polyethylene tube utilizing 1/4 or 1/8 male thread by 3/8 hose fittings, straight, "L's", or "T's", as needed. We fabricate a filter by taking a piece of 3/8" aluminum tubing (OD) and putting approximately 20 small holes in it up to about 4" from the end. Clean out all the chips and loose pieces , and slide a piece of foam rubber approximately 2" X 2" square by 6" long over the perforated tube to act as a filter. Attach this to the "air-in" side of your vacuum instruments with 3/8" hose and fittings.



STATIC PORT



The static port (SKETCH TO SIDE) is made with a piece of 3/8" soft aluminum tubing about 5" long embedded vertically in the pilot side of the fuselage. To install this piece of tube, first bend a 3/4" offset in the center of the tube. Next, remove the inner skin and foam in a section approximately 1/2" wide by 4" high , centered 10" aft of the canard bulkhead and 10" below the elevator. Install the tube vertically, and flush with the outer skin, with the offset end up. Use micro balloon (genimid & Q-cells) to install flush with the inner skin. Following cure, drill (3) 1\16" holes from the inside out through the tube and outer skin. The holes

should be about 1/2" apart vertically. Fill the holes on the inside with micro or silicone sealant. Connect the tube to your rate of climb, altimeter, and airspeed with poly tubing and PVC fittings.

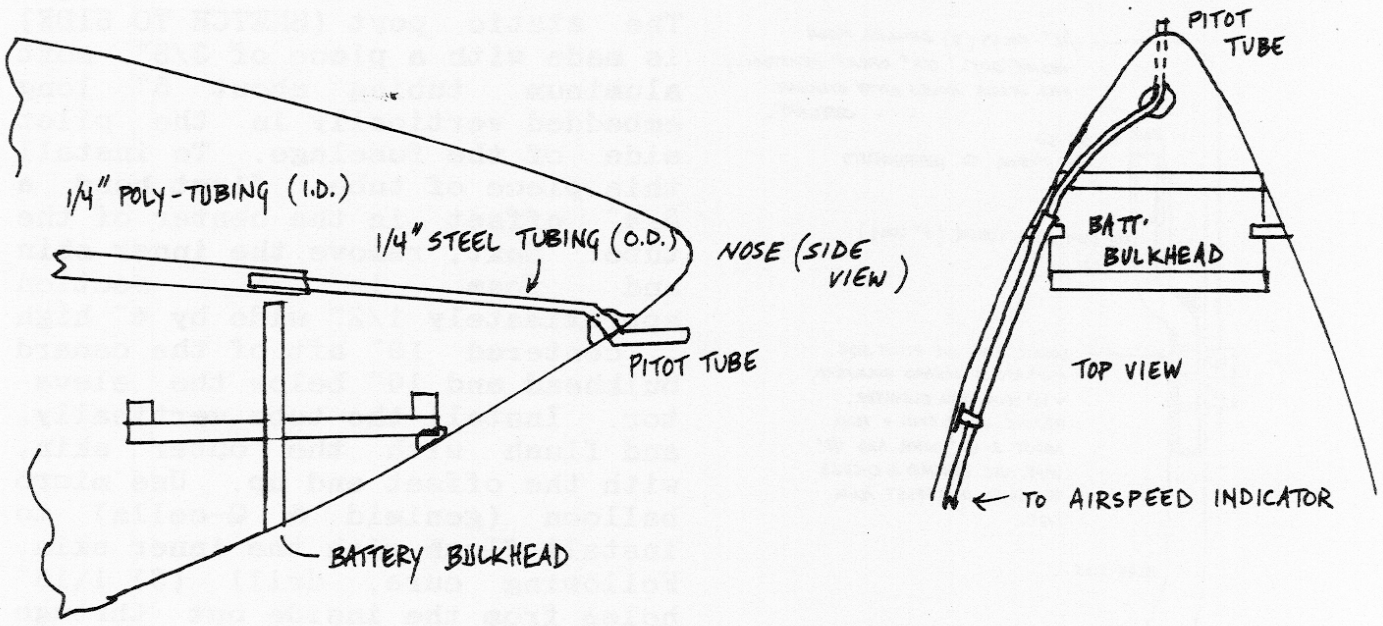
PITOT

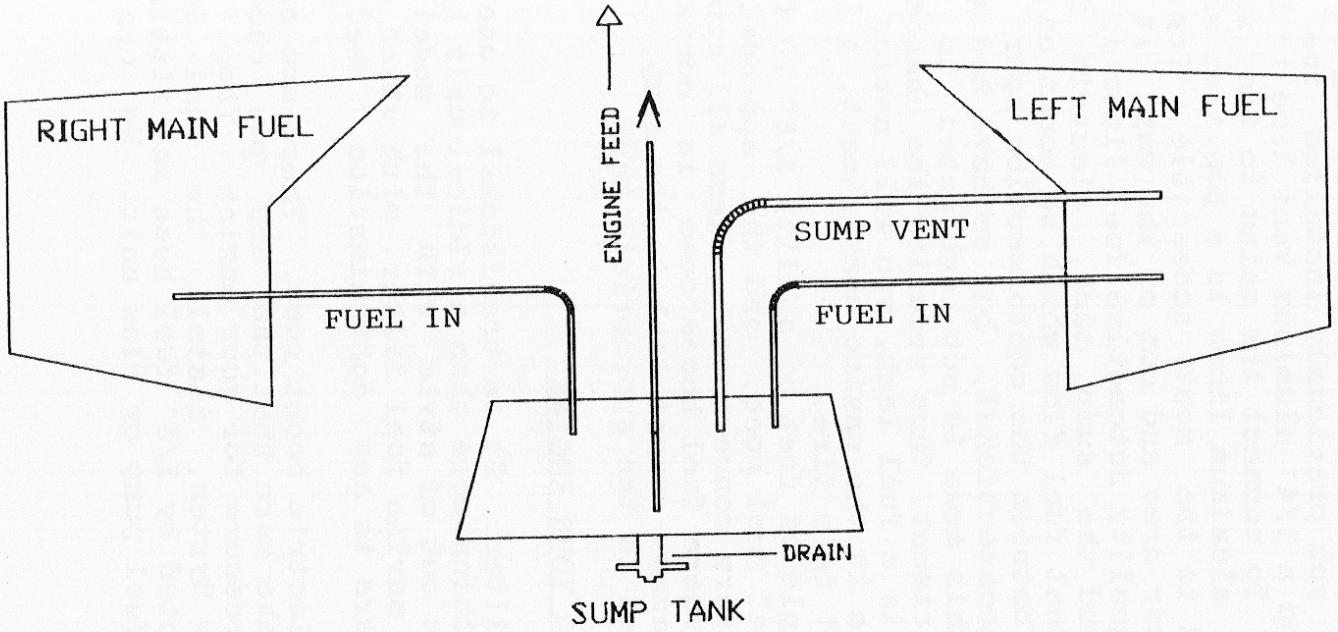
There are many variations of pitot tubes and systems. If you are considering serious IFR work, you might want a heated pitot tube. Whatever you install, and however you install it, remember that it requires undisturbed air and that it will be affected by angle of attack. So, if you are going to make any special installations, plan ahead.

We have devised a simple installation that has worked well for us. It is constructed with approximately 10" of 1/4" steel brake line tubing bought from a local auto parts supply house, and approx. 6' of 1/4" poly tubing and a PVC fitting for your airspeed indicator. This tube is installed on the centerline of the aircraft with its inlet opening aprox. 1-1/2" below and 1/2" behind the nose of the aircraft. The tube has an offset bend in it 2" from one end where it goes through the lower skin and is bent off to the pilot's side to follow the side of the fuselage. It is installed with microglass in a 1/4" hole drilled below the nose and aprox. 2-1/2" back from the nose.

CAUTION Installation of this to extend past the nose could result in injury to someone walking past the nose of the aircraft.

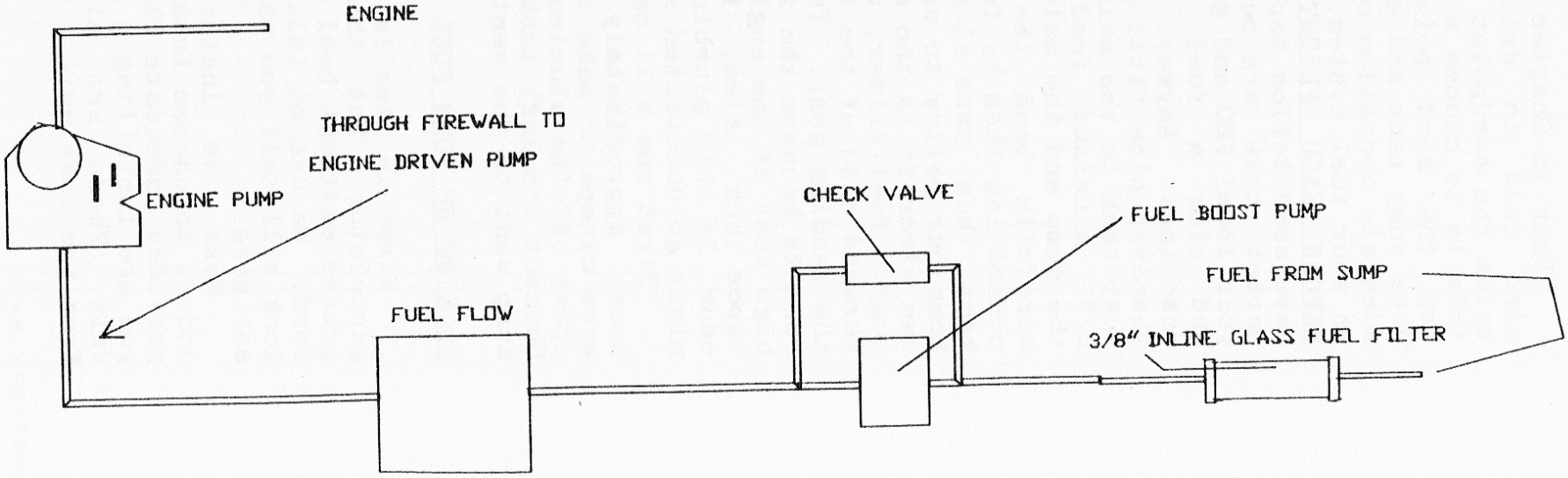
PITOT TUBE





FUEL SYSTEM DIAGRAM

PAGE 718



Back in Chapter 4, you installed your sump tank. You were also told to drill a hole in the bottom of your fuselage just below the hardpoint in the sumptank. The first thing to do after this is to choose a quick drain, either 1/4" or 1/8". Drill and tap the hard point to accept the drain. Install the drain in your sump tank and enlarge the hole in the lower fuselage for adequate operation of your sump drain. This is the lowest point in your fuel system, so pay close attention to it and USE IT BEFORE EACH FLIGHT. In the installation of all fuel lines we have used teflon tape. I feel that there are sealants on the market that are better and safer for fuel systems, so contact your local FBO and get his advice. Teflon tape can break loose and clog a fuel injection system, and it tends to leak sometimes. Anyway, some type of thread sealant must be used whenever pipe fittings are to be used. On the connecting of the sump tank to the main tanks, you previously installed the (2) 3/8" aluminum feed lines and a 1/4" aluminum vent line to both the sump and the main tanks. To connect the mains to the sump, carefully bend the mating aluminum lines to a position where connecting them by fuel lines is the most accessible. Try to keep them back along the spar area and out of the way. It has been our policy to use good quality automotive fuel lines in our own aircraft in the area around the sump tank, electric fuel pump, fuel filter, and optional fuel flow which we mount on the forward side of the firewall between the centersection spar and the landing gear. This is unconventional, but we have had good results because the fuel in this area is not subjected to the high heat of the engine compartment, thus reducing the chance of vapor lock. Also, if there is a fuel leak, you will notice the odor. If this plumbing is done in the engine compartment, a leak might go undetected and result in a fire.

First you will need a couple of feet of quality 3/8" ID fuel hose, approximately 1' of 1/4" fuel hose, and the appropriate hose clamps to make the necessary connections. Clean all excess epoxy off the aluminum tubes where fuel hoses come in contact. Connect the left tank to the sump, right tank to the sump, and sump vent to the vent installed in the appropriate tank.

HOOKING UP YOUR FUEL SYSTEM TO YOUR ENGINE

First in line is a fuel filter. It is traditional to use a gascolator, but they are nothing more than a ridiculously high priced sediment bowl that went out of style with the model A Ford. We use an inline glass marine fuel filter, with which one look will tell you whether there is any contamination. Need I say more.

Next, we install the electric boost pump. There are many models to choose from, and make sure that the one you choose provides adequate flow and pressure for your engine. Then, if you are installing a Fuel Flow System, install the Fuel Scan Unit. These are all connected by 3/8" fuel hose and fittings from the last unit, whether fuel pump or flow unit. We use a

premium quality 3/8 fuel line with appropriate sweged fittings to mate to your engine and to your fuel system. We do not install an ON-OFF valve, but if you should decide to do so, somewhere in this line is the place to install it. The line goes through the firewall and is subject to vibration, so it is important to isolate the line from abrasion on the firewall. An adequate rubber grommet works fine. This fuel line should have some sort of steel or wire reinforcement, such as aeroquip lines do. As for the plumbing of your fuel system, after the fuel leaves the manual fuel pump on the engine, it is best to follow the engine manufacturers recommendations as for the hoses and fittings to use.

It is also very important to install a fuel bypass around the electric fuel boost pump utilizing a fuel check valve. Some electrical fuel pumps restrict the fuel flow when turned off, thus not allowing your engine to get the fuel required to operate properly. When installing your fuel system components, support them off the forward side of the firewall with adequate brackets. Remember that many engine failures are due to fuel starvation, so use EXTREME CAUTION in the installation of your fuel system. Do not drill or mount anything to the spar caps of the center-section spar.

PRESSURE CHECKING FUEL SYSTEM

Caution must be taken while pressure checking your fuel system. Use an altimeter for a pressure guage and pressurize your system no more than it takes to make a 1500´ change in the altimeter. Check all fittings and block off the fittings that lead to the engine. The best place to install the altimeter is at one of the fuel tank vents. The ideal way to close off a vent line is to put a small piece of hose over the line and clamp it shut. If this is not possible, put a small dab of 5-minute epoxy and micro in the end of the tube. After completion of pressure testing, drill it out with a drill bit and vecuum out the debris. When all the lines are sealed and the altimeter is installed, carefully inflate the fuel system to 1500´ on the altimeter. DO NOT OVER-INFLATE! Close off the feed line and watch for an altitude change. If a rapid change occurs, listen for a leak, and check with soapy water. Check fittings and fuel caps first, then try to isolate the leak to either the sump tank or one of the mains. Continue to paint all areas with soapy water until leaks are found. Clean off the soapy water with clean water and alcohol, then let the area dry completely. Afterwards, use a vacuum cleaner to apply negative pressure to your tank. Being careful not to vacuum so much so as to harm the structure, brush safetypoxy over the leak for a couple of minutes, then continue to brush on the epoxy for a minute or so after the vacuum is removed. Recheck the system following cure, and keep in mind that a good leak free system should hold the altitude indefinitely, though small changes due to temperature variations should be expected.

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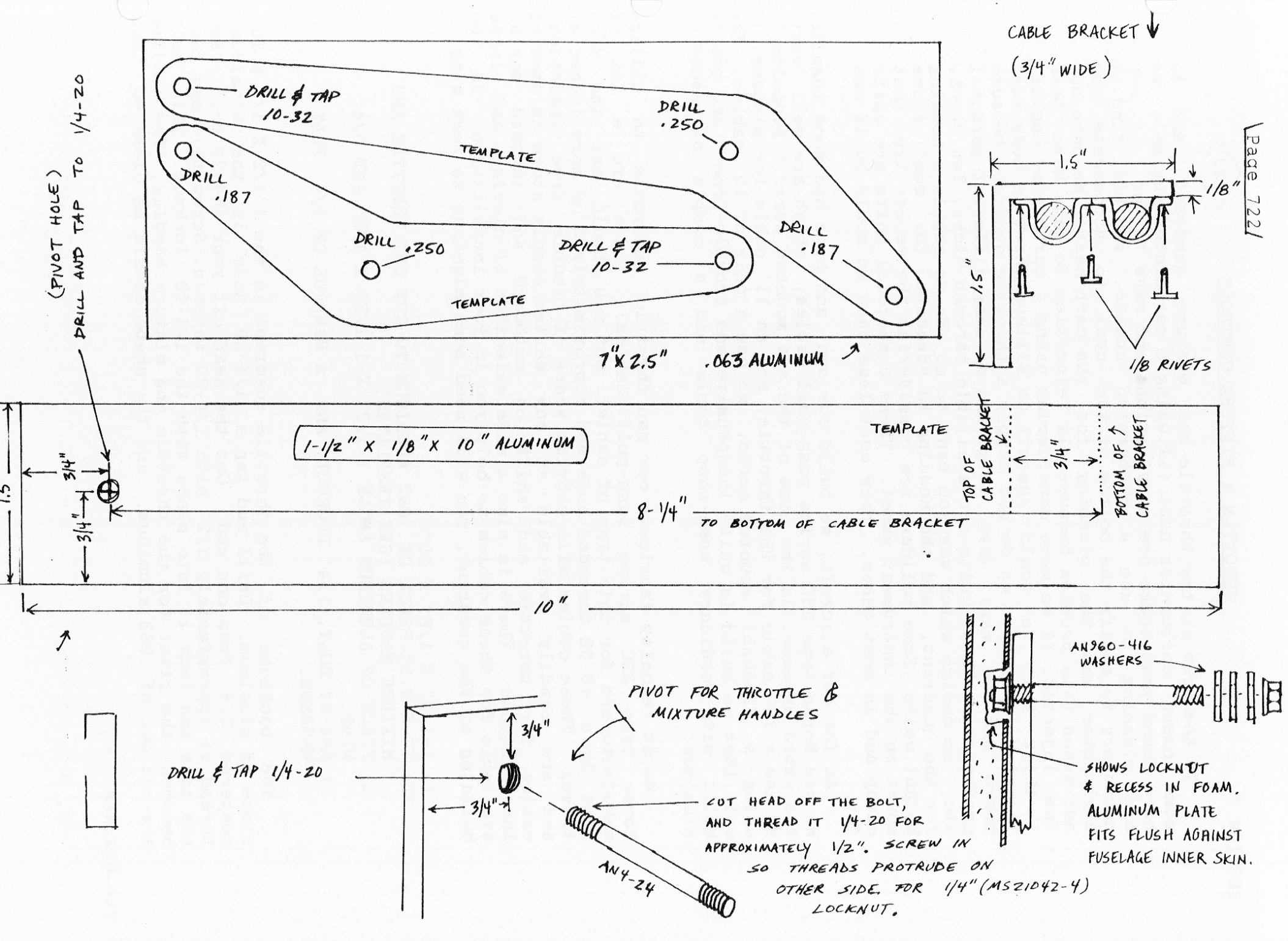
FUEL SIGHT GUAGES

When you built your tanks, you installed two brass elbows in the rear baggage bulkhead. These are to be connected with a piece of clear fuel line (tygon tubing) utilizing either small hose clamps or good heavy duty Nylon Tywraps. The tywraps aren't as good, but they look a lot better and we have not experienced any problems with them on our aircraft. When filling your aircraft with fuel, get it level on the ramp, then fuel up with 5 gallons at a time on each side. Mark the consecutive levels with tape or a permanent marker. Make sure that you close off the line to the sump tank while doing this, and open the line when completed.


CABLE BRACKET
(3/4" WIDE)
DRILL & TAP 10-32
DRILL .250
TEMPLATE
DRILL .187
DRILL .250
DRILL & TAP 10-32
DRILL .187
TEMPLATE
7" X 2.5" .063 ALUMINUM
1.5"
1/8"
1.5"
1/8 RIVETS
(PIVOT HOLE) DRILL AND TAP TO 1/4-20
1-1/2" X 1/8" X 10" ALUMINUM
TEMPLATE
TOP OF CABLE BRACKET
3/4"
BOTTOM OF CABLE BRACKET
3/4"
3/4"
1.5
8-1/4" TO BOTTOM OF CABLE BRACKET
10"
AN960-416 WASHERS
PIVOT FOR THROTTLE & MIXTURE HANDLES
DRILL & TAP 1/4-20
3/4"
3/4"
AN4-24
CUT HEAD OFF THE BOLT, AND THREAD IT 1/4-20 FOR APPROXIMATELY 1/2". SCREW IN SO THREADS PROTRUDE ON OTHER SIDE FOR 1/4" (MS21042-4) LOCKNUT.
SHOWS LOCKNUT & RECESS IN FOAM. ALUMINUM PLATE FITS FLUSH AGAINST FUSELAGE INNER SKIN.

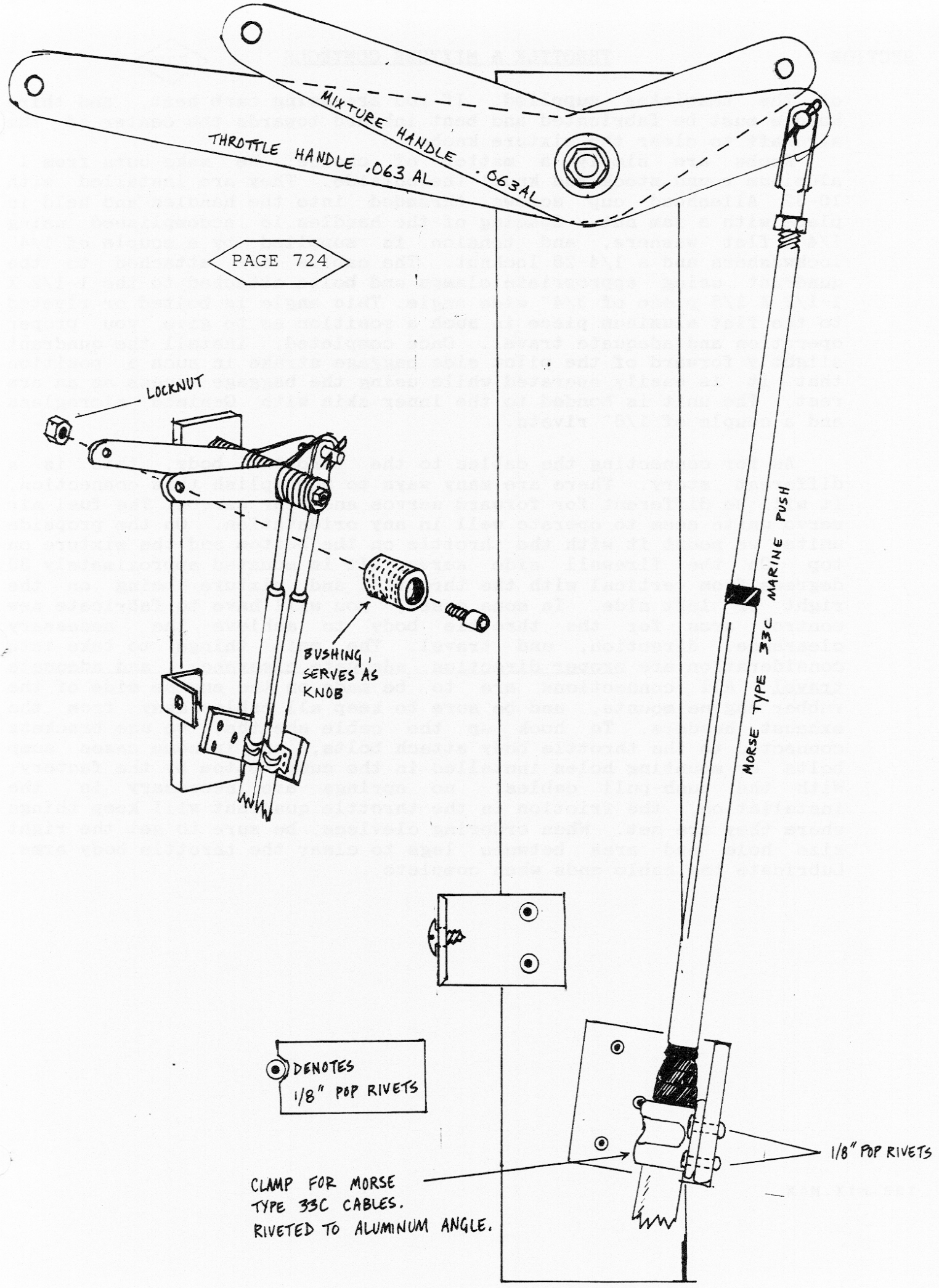
In the area of the throttle and mixture quadrant, and in some cases carburetor heat (if using a carburated engine), we have found that there are many options and ways to go. If you are planning to use a carburated engine, you will find it necessary to modify the bottom of the cowl to accomodate the carburetor and the plumbing for the carb heat. We have not addressed this problem because all Velocities to date have been fuel injected. If we were considering using a carburated engine, I think that we would install an Ellison Throttle Body Fuel Injector. Anyway, we do not supply a throttle quadrant because there are so many ways to go and so many different personal preferences. These units are available through Wicks, Ken Brock, etc., so decide which way you want to go. We do supply a housing for the quadrant, and the housing is adequate for most store bought units. Some builders are considering the veneer type that mount on the instrument panel. These commercial units are quite cheap and in most cases, they cost less than we could build one for.

As for our aircraft, we build our own, and have had good results. We use Morse type 33C marine push-pull cables, which are well worth the extra expense. In the case of the aft mounted servo (propside), we use a 10´ cable for the throttle, and an 11´ cable for mixture. If using a firewall mounted servo, we use a pair of 10´ cables. The unit that we build is quite inexpensive and trouble-free, and can be built with ordinary home-shop tools and a couple of pieces of aluminum.

We at Velocity fabricate our own throttle quadrants to utilize Morse type 33C marine push-pull cables. There are a lot of manufacturers for this type of cable, but you should use the ones that have 10-32 threaded ends and approximately 3 or more inches of travel. These cables will provide years of trouble free operation, and are readily available at any marine supply store as control cables for throttle and shift on outboard and inboard marine installations. There is also a wide selection of clevises and clamps available for these cables to help you in your installation. In the building of the quadrant, you will need some aluminum to work with:

1) 1-1/2" X 1/8" X 10"
1) 7" X 2.5" PIECE OF .063 ALUMINUM TO CUT OUT THROTTLE AND MIXTURE HANDLES (SEE TEMPLATES)
1) PIECE OF ALUMINUM ANGLE 1-1/2" X 1-1/2" X 1/8" AND 3/4" WIDE.
1) AN4-24 BOLT, 1/4" LOCKNUT, AND A HANDFUL OF 1/4" FLAT WASHERS.

The backbone of the throttle quadrant is the 1-1/2 X 1/8 X 10" piece of aluminum. Drill and tap a 1/4-20 hole in the aluminum, centered 3/4" from one end. Cut the head off your AN4-24 bolt, and thread it approximately 1/2" with 1/4-20 threads. Screw this end into the hole and lock it into place with the 1/4-20 locknut. This bolt becomes the pivot for the throttle and mixture handles. The handles are cut out of .063 aluminum, and the shape should be close to that

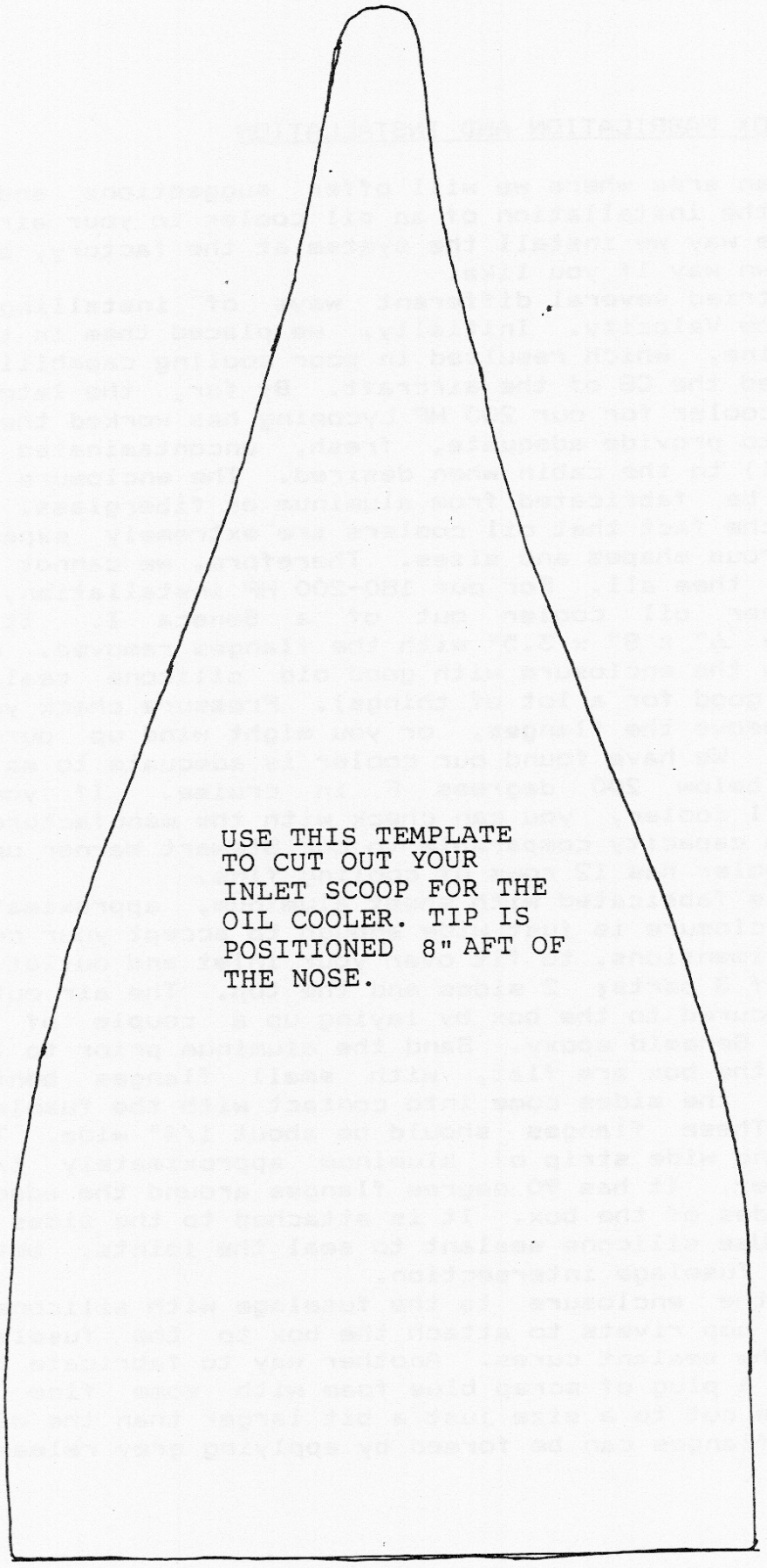

MIXTURE HANDLE .063AL
THROTTLE HANDLE .063 AL
PAGE 724
LOCKNUT
BUSHING, SERVES AS KNOB
MORSE TYPE 33C MARINE PUSH
DENOTES 1/8" POP RIVETS
1/8" POP RIVETS
CLAMP FOR MORSE TYPE 33C CABLES. RIVETED TO ALUMINUM ANGLE.

of the templates supplied. If you are using carb heat, and third handle must be fabricated and bent inboard towards the center of the aircraft to clear the mixture knobs.

Knobs are simply a matter of choice. We make ours from 1" aluminum round stock and knurl the outside. They are installed with 10-32 Allenhead cup screws threaded into the handles and held in place with a jam nut. Spacing of the handles is accomplished using 1/4" flat washers, and tension is supplied by a couple of 1/4" lockwashers and a 1/4-28 locknut. The cables are attached to the quadrant using appropriate clamps and bolts attached to the 1-1/2 X 1-1/2 X 1/8 piece of 3/4" wide angle. This angle is bolted or riveted to the flat aluminum piece in such a position as to give you proper operation and adequate travel. Once completed, install the quadrant slightly forward of the pilot side baggage strake in such a position that it is easily operated while using the baggage recess as an arm rest. The unit is bonded to the inner skin with Genimid microglass and a couple of 1/8" rivets.

As for connecting the cables to the throttle body, this is a different story. There are many ways to accomplish this connection. It will be different for forward servos and rear servos. The fuel air servo units seem to operate well in any orientation. On the propside units, we mount it with the throttle on the bottom and the mixture on top. On the firewall side servo, it is mounted approximately 30 degrees from vertical with the throttle and mixture being on the right or left side. In some cases, you will have to fabricate new control arms for the throttle body to achieve the necessary clearance, direction, and travel. The main things to take into consideration are proper direction, adequate clearance, and adequate travel. All connections are to be made on the engine side of the rubber engine mounts, and be sure to keep all cables away from the exhaust headers. To hook up the cable sheaths, we use brackets connected to the throttle body attach bolts, and in some cases sump bolts or mounting holes installed in the sump bottom by the factory. With the push-pull cables, no springs are necessary in the installation, the friction in the throttle quadrant will keep things where they are set. When ordering clevises, be sure to get the right size hole and area between legs to clear the throttle body arms. Lubricate the cable ends when complete.

OIL COOLER INSTALLATION



OIL COOLER BOX FABRICATION AND INSTALLATION

This is an area where we will offer suggestions and sketches concerning the installation of an oil cooler to your aircraft. We will show the way we install the system at the factory, but you can do it your own way if you like.

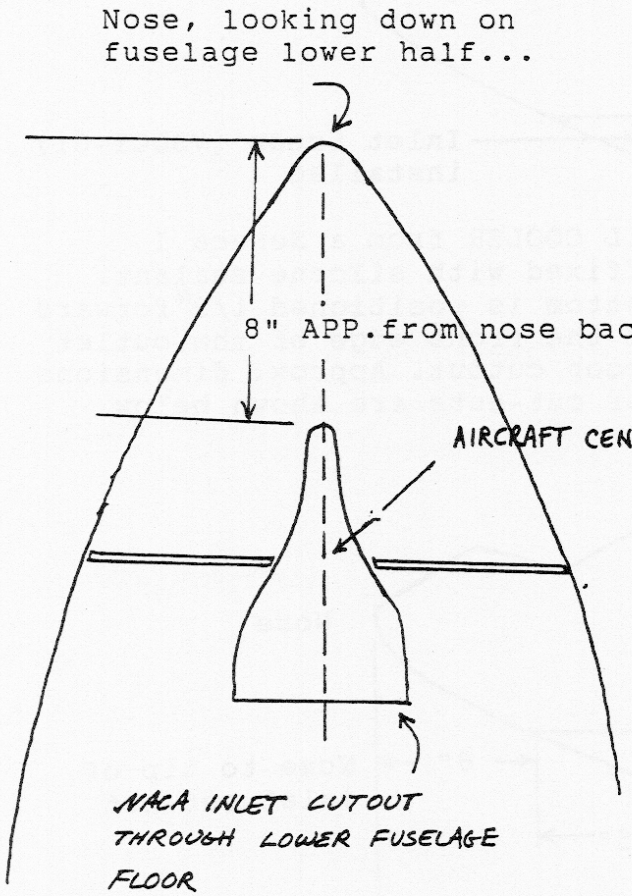
We have tried several different ways of installing the oil cooler to the Velocity. Initially, we placed them in the cowl with the engine, which resulted in poor cooling capabilities, and also affected the CG of the aircraft. By far, the latest forward mounted oil cooler for our 200 HP Lycoming has worked the best, and also serves to provide adequate, fresh, uncontaminated air (both warm and cool) to the cabin when desired. The enclosure around the cooler can be fabricated from aluminum or fiberglass. A problem arises with the fact that oil coolers are extremely expensive and come in numerous shapes and sizes. Therefore, we cannot tailor one box to fit them all. For our 180-200 HP installation, we use a Stewart Warner oil cooler out of a Seneca I. It measures approximately 6" x 8" x 3.5" with the flanges removed. We install the cooler in the enclosure with good old silicone sealant (told you it was good for a lot of things). Pressure check your cooler before you remove the flanges, or you might wind up purchasing a useless unit. We have found our cooler is adequate to maintain oil temperature below 200 degrees F in cruise. If you have a comparable oil cooler, you can check with the manufacturer to see if it has a capacity comparable to our Stewart Warner unit. This particular cooler has 12 rows of cooling fins.

The box is fabricated with sheet aluminum, approximately .035" thick. The enclosure is just wide enough to accept your cooler, and with proper dimensions, to fit over your inlet and outlet. The box is made up of 3 parts; 2 sides and the top. The air outlets will have to be secured to the box by laying up a couple of plies of fine bid with Genemid epoxy. Sand the aluminum prior to the layup. The sides of the box are flat, with small flanges bent on the bottom where the sides come into contact with the fuselage bottom and inlet. These flanges should be about 1/4" wide. The top is actually a long wide strip of aluminum approximately 1/4" wider than the cooler. It has 90 degree flanges around the edges to mate with the sides of the box. It is attached to the sides with 1/8" pop rivets. Use silicone sealant to seal the joints, both at the sides and the fuselage intersection.

Install the enclosure to the fuselage with silicone sealant, using several pop rivets to attach the box to the fuselage inner skin until the sealant cures. Another way to fabricate the box is to glass over a plug of scrap blue foam with some fine bid. The plug should be cut to a size just a bit larger than the oil cooler. The mating flanges can be formed by applying grey release tape on

the fuselage areas that are affected. Once removed from the nose of the aircraft, the foam plug must be removed from the glass enclosure. Cut the new box in half so that you can install the cooler. Build a flange on the box, similar to that of the ones built on the wheel pants, so you can easily reassemble the box. In the actual plumbing, we use flare fittings and 1/2" soft aluminum tubing.

On the previous page, we supplied a template for the Naca-shaped inlet that will provided the air to the oil cooler. See diagram below for placement of the inlet, which you will cut out yourself.

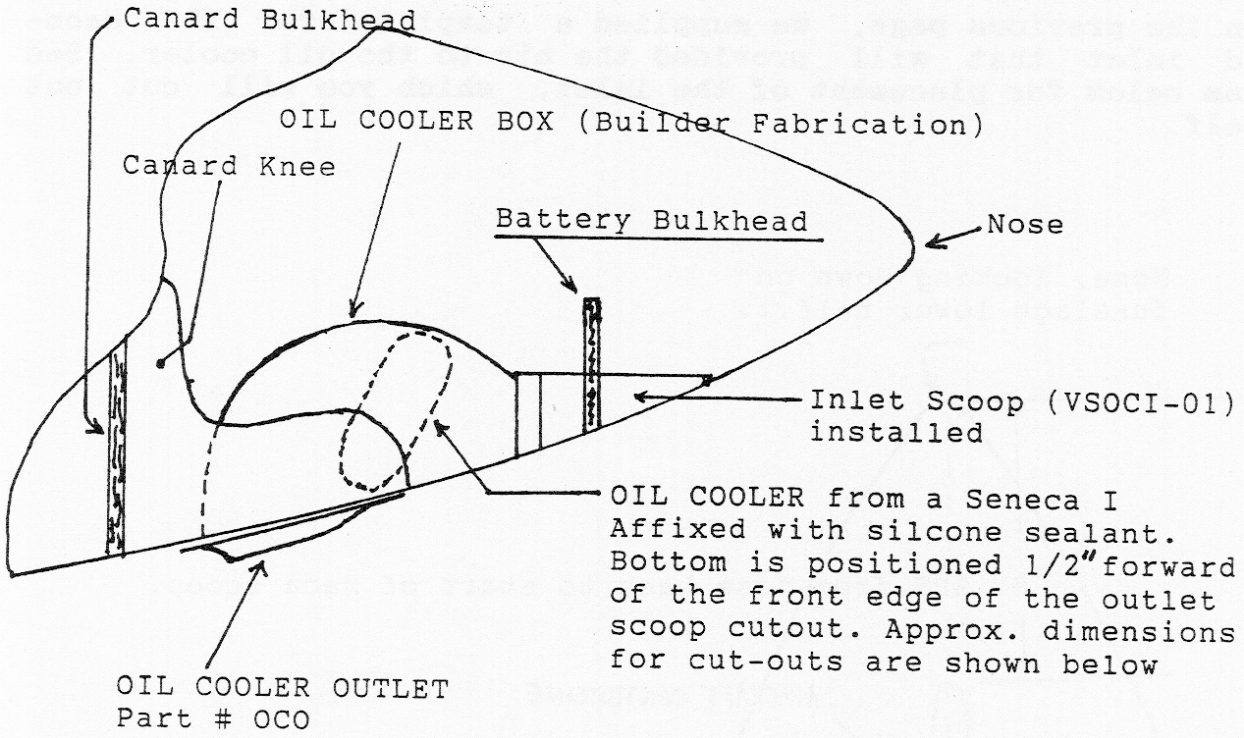


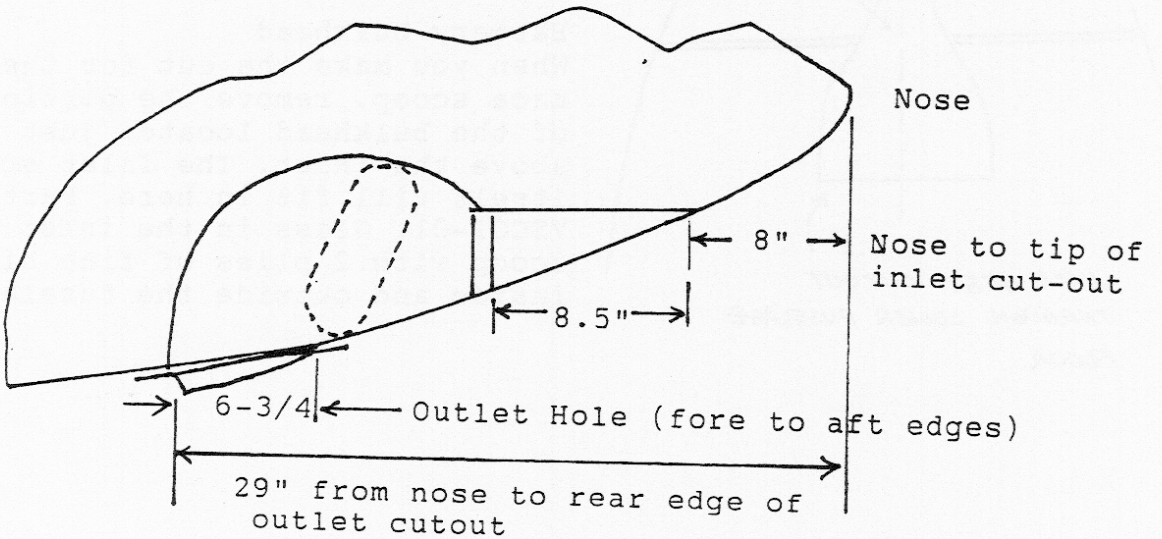
Battery bulkhead
When you make the cut for the naca scoop, remove the portion of the bulkhead located just above the inlet. The Inlet scoop itself will fit in here. Part # VSCOI-01. Glass in the inlet scoop with 2 plies of fine bid, inside and outside the fuselage.

OIL COOLER ENCLOSURE

728-A

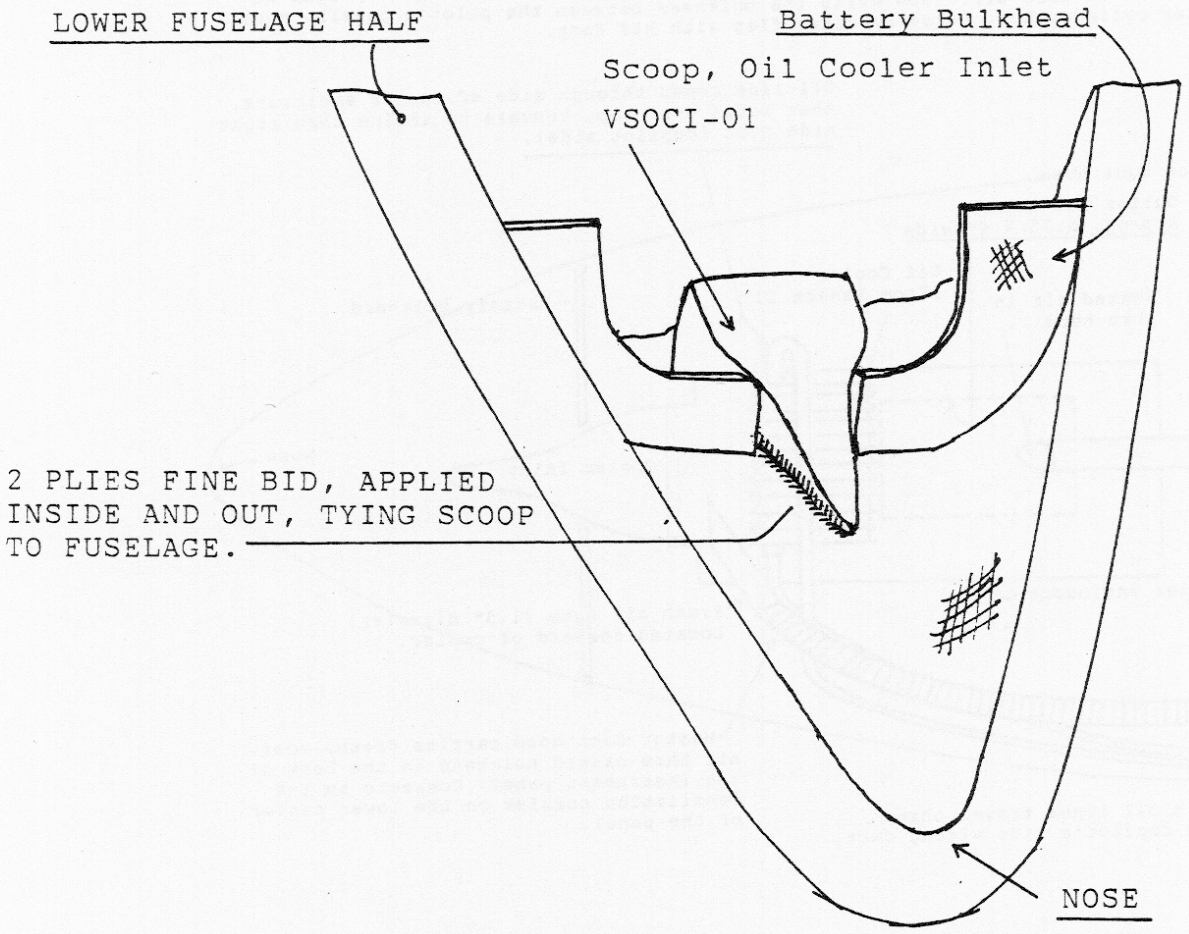
The sketches below should help show you how we set up our oil cooler and enclosure.





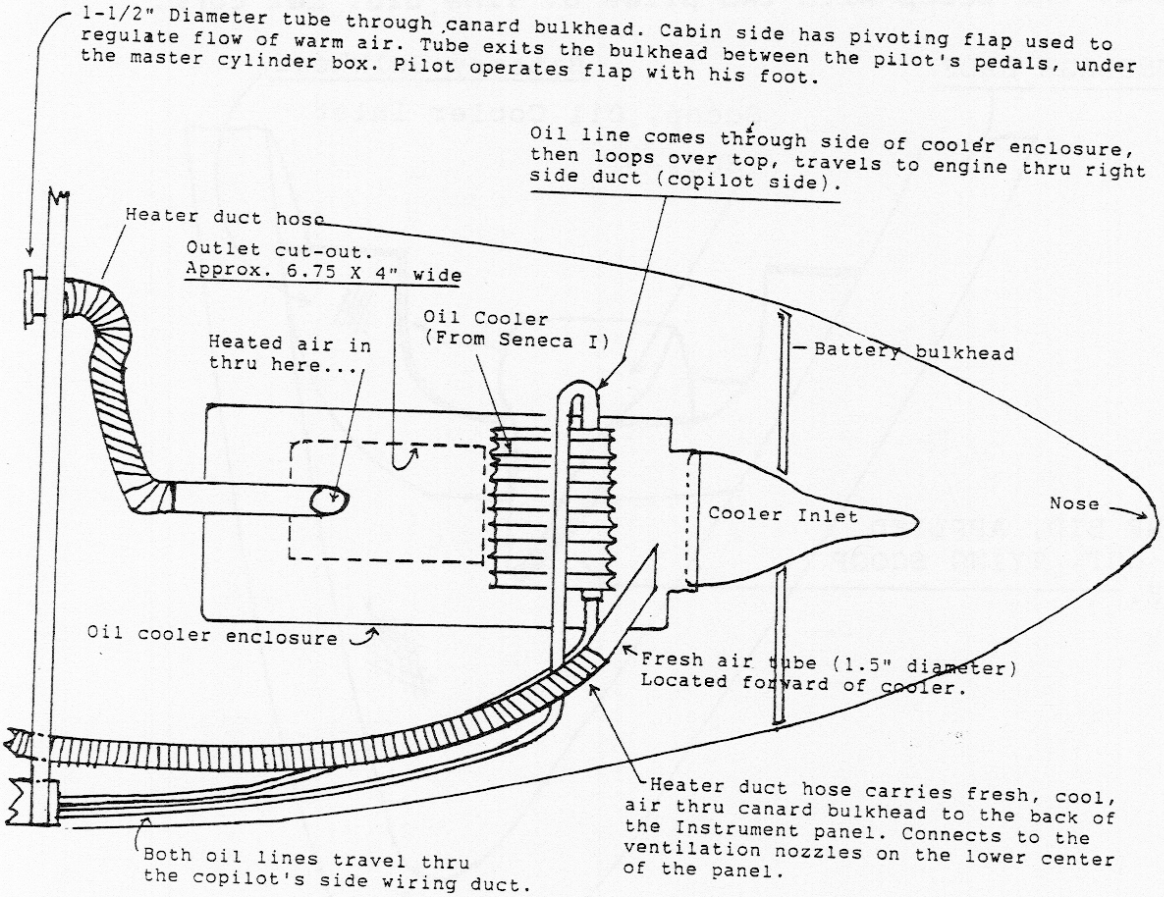
OIL COOLER INLET SCOOP [Diagram below]

Once your inlet scoop hole has been cut out of the floor of the lower fuselage half, it is time to install the interior portion of the scoop assembly (Part #VSOCI-01: SCOOP, OIL COOLER INLET). As you can see, the part we supply fits into the cutout, and forms the roof and sides of the inlet. Trim the inlet hole so that the molded part will fit snugly into the cutout, its edges flush with the exterior skin of the fuselage. We keep the inlet roof parallel to the ground with the aircraft level. Once you are satisfied with the fit, sand around the edges of the inlet cutout, roughing up the inner and outer skins of the fuselage to accept a lay-up. Hold the scoop in place with 5-minute epoxy or bondo, and install with 2 plies of fine bid to the inside of the fuselage. From the outside of the fuselage, fill any voids between the molded part and the scoop cutout with microballoon, then tie the outer fuselage skin to the inside of the scoop with two plies of fine bid. Let cure.



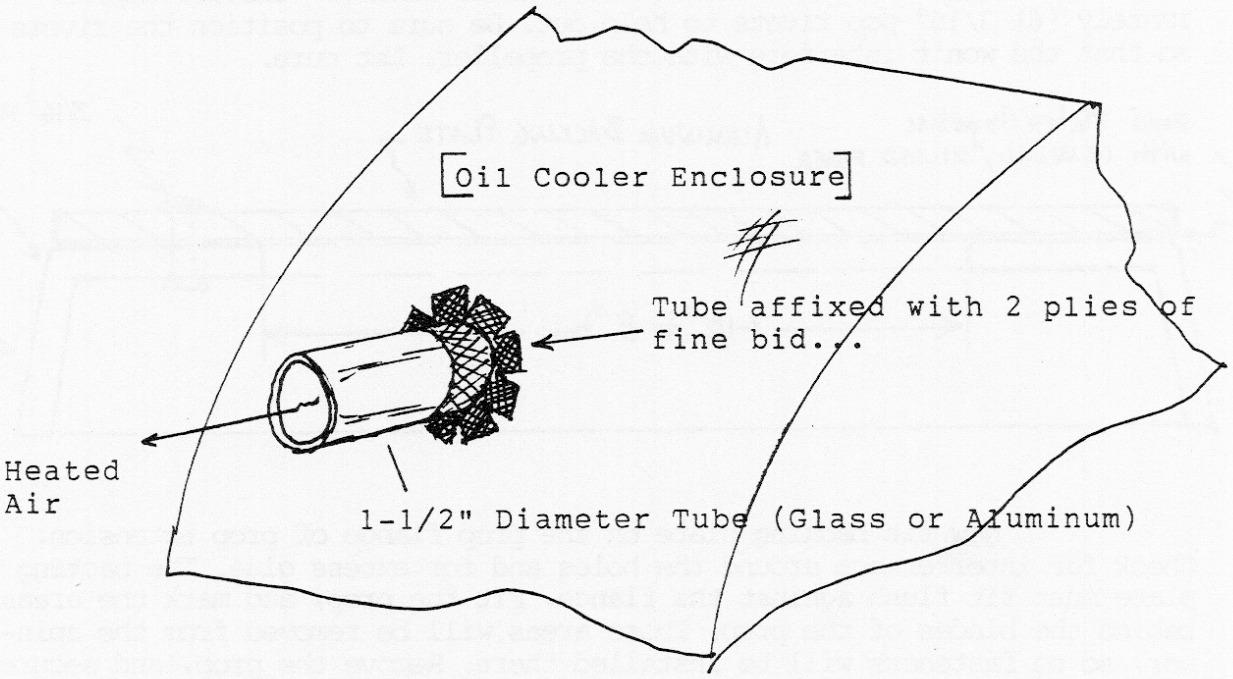
OIL COOLER & ENCLOSURE

As stated earlier, we use a good sized oil cooler salvaged from a Seneca I. The dimensions are approximately 7 X 8 X 3.5, with 12 rows of cooling fins. We angle the cooler forward inside the enclosure, and affix it in place with silicone sealant, applied liberally to the sides, floor, and roof of the cooler box. When installing your oil cooler, there are a couple of things to keep in mind. One is to leave room for the cabin air intake tubes. Fresh cabin air is supplied by a 1-1/2" tube angled in through the right side of the box, forward of the oil cooler. The tube is angled directly into the incoming airstream. The end of the tube is cut at an angle perpendicular to the direction of the incoming air. The other end of the aluminum tube is connected to a hose, which runs through the canard bulkhead below the doubler and below the rudder bar to the air nozzles on your instrument panel. The hose we use is heater duct hose, and can be purchased at an auto supply house. It is durable and inexpensive. Refer to the following sketch:

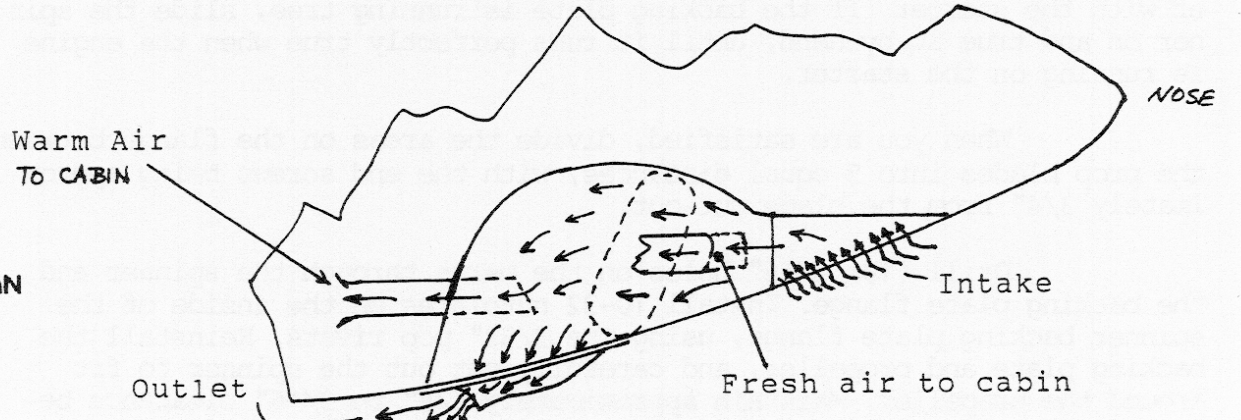


ROUTING HEATED & FRESH AIR

The cabin heat outlet is a 1-1/2" tube (aluminum or glass) which is installed through the center of the back of the oil cooler box. 2 plies of fine bid, and maybe a bit of Genemid microglass should secure the tubes in place quite nicely. It is behind the cooler, and the end of the tube is cut perpendicular to the airflow. The other end of the tube is hooked to a length of (heater duct hose) which leads to another 1-1/2" tube attached through the canard bulkhead between the rudder pedals on the pilot's side. Flow of heated air into the cabin is controlled by a single pivoting flap over the end of this tube. The flap is operated by the pilot's foot.



AIR FLOW THRU OIL COOLER SYSTEM

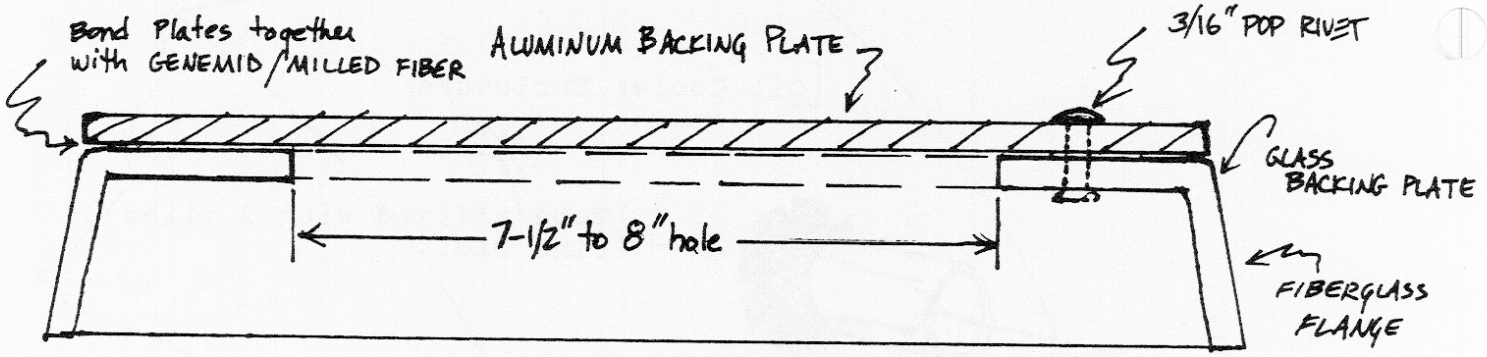


SPINNER BACKING PLATE INSTALLATION
Page 732 Rev 11/90

(1) FIBERGLASS SPINNER
(1) FIBERGLASS SPINNER BACKING PLATE
(1) ALUMINUM BACKING PLATE
(10) MS21047-3 NUTPLATES
(10) AN526C-1032R8 Stainless Steel Screws
(20) AAC-3-4 Pop Rivets (3/32")

Due to problems with earlier all-fiberglass backing plates, we have incorporated an aluminum backing plate. This combination has proven to be trouble-free, thus eliminating the warping in the glass backing plate, and the tearing or cracking common in an aluminum spinner.

The first step is to cut a hole in the center of the fiberglass backing plate approximately 7-1/2 to 8" in diameter to clear the prop end flange on your prop extension. Center the aluminum plate on the glass plate. You can use a record player or something that rotates slowly to dial it in. Mark the positions, sand the mating surfaces, and bond together with GENEMID MICROGLASS (MILLED FIBER). Install approximately (6) 3/16" pop rivets to help out. Be sure to position the rivets so that the won't interfere with the propeller. Let cure.

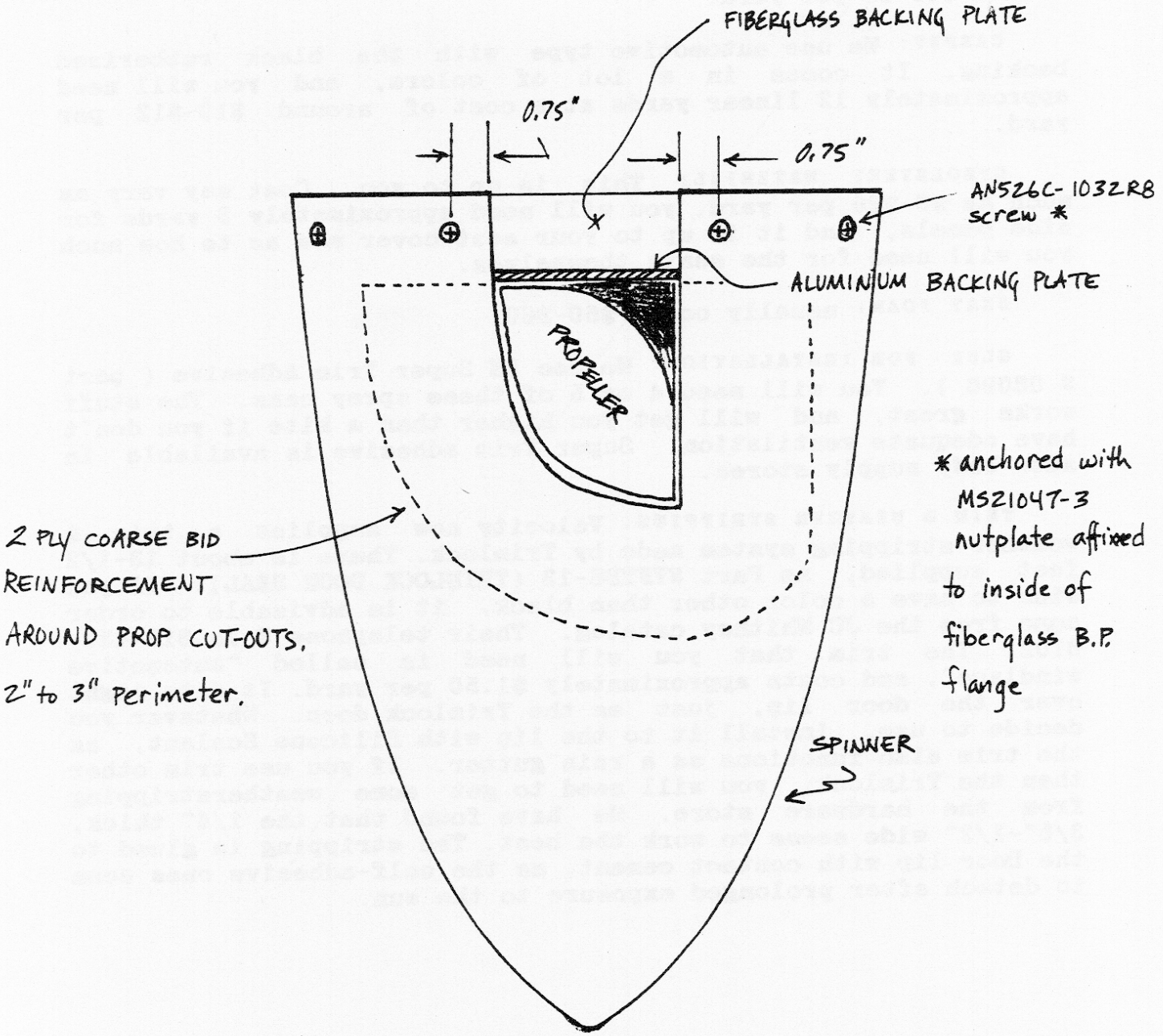


Now fit backing plate on the prop flange of prop extension. Check for interference around the holes and for excess glue. The backing plate must fit flush against the flange. Fit the prop, and mark the areas behind the blades of the prop. Those areas will be removed from the spinner, so no fasteners will be installed there. Remove the prop, and secure the backing plate to the prop extension with a couple of bolts and a washers. Remove the spark plugs from the engine, and crank the engine over with the starter. If the backing plate is running true, slide the spin ner on and true it by hand, until it runs perfectly true when the engine is running on the starter.

When you are satisfied, divide the areas on the flange between the prop blades into 5 equal distances, with the end screws being approx imately 3/4" from the blade cut-out.

Drill (10) 3/16" holes on the marks through the spinner and the backing plate flange. Install 10-32 nutplates on the inside of the spinner backing plate flange, using the 3/32" pop rivets. Reinstall the backing plate and propeller, and carefully cut out the spinner to fit around the propeller. Maintain approximately 1/8" to 3/16" clearance be-

tween the propeller blades and the spinner. Sometimes it helps to make a paper template. After proper fit is achieved, remove the spinner and add a 2-ply reinforcement of coarse bid around the blade cut-out on the inside of the spinner (approximately a 2" to 3" perimeter is OK). Be careful not to bring the reinforcement on to the area where the spinner fits on the flange. Once cured, check the fit. It could be helpful to post cure the spinner in an oven to approx 300°F for a few minutes. Stand the spinner on end and let cool down slowly.



see Next Section

SECTION 8

INTERIOR FINISHING

UPHOLSTERY AND INTERIOR COSMETICS

A nice interior should run you around $1000.00 if you have the seats upholstered by a professional, and do the carpet, headliner, and side panels yourself.

HEADLINER MATERIAL: This is late model headliner material, which is a velour cloth fabric with a piece of 1/4" foam bonded to the back. It comes in many colors and is glued to the interior of the fuselage and door from the windows up with contact cement. You will need approximately 4 yards at a cost of around $10-12 per yard.

CARPET: We use automotive type with the black rubberized backing. It comes in a lot of colors, and you will need approximately 12 linear yards at a cost of around $10-$12 per yard.

UPHOLSTERY MATERIAL: This is up to you. Cost may vary as much as $6-$20 per yard. you will need approximately 3 yards for side panels, and it is up to your seat cover man as to how much you will need for the seats themselves.

SEAT FOAM: usually costs $50-$60.

GLUE FOR INSTALLATION: We use 3M Super Trim Adhesive (part # 08090). You will need 4 or 5 of these spray cans. The stuff works great, and will get you higher than a kite if you don't have adequate ventilation. Super Trim adhesive is available in auto body supply stores.

TRIM & WEATHER STRIPPING: Velocity now supplies a trim & weather stripping system made by Trimlock. There is about 13-1/2 feet supplied, as Part #VFTDS-13 (TRIMLOCK DOOR SEAL). If you wish to have a color other than black, it is advisable to order some from the JC Whitney catalog. Their telephone # is 312-431-6102. The trim that you will need is called "automotive windlace", and costs approximately $1.50 per yard. It fits right over the door lip, just as the Trimlock does. Whatever you decide to use, install it to the lip with Silicone Sealant, as the trim also functions as a rain gutter. If you use trim other than the Trimlock, you will need to get some weatherstripping from the hardware store. We have found that the 1/4" thick, 3/8"-1/2" wide seems to work the best. The stripping is glued to the Door lip with contact cement, as the self-adhesive ones seem to detach after prolonged exposure to the sun.