

HOBBY BARN

QUALITY LINE KITS™

F86 SABRE JET



Kit includes epoxy glass fuselage, clear canopy, foam wing and stab, plans and instructions.

Wingspan: 47 in

F-86

SABRE JET

QUALITY LINE KITS

BUILDING INSTRUCTIONS

FAN SELECTION:

This model is designed to accept a wide variety of fans with engine displacements ranging from .45 to .65. Any of the following listed fans will fit: MIDWEST RK40, TURBAX I, TURBAX III, BOSS 602, KRESS RK 7-40, or TOM COOKS DYNAMAX FAN. We used a Tom Cook DYNAMAX fan in our recent test model, which worked extremely well.

EPOXY FIBERGLASS PARTS:

The fuselage is made of special light weight epoxy and fiberglass cloth. Epoxy glue should be used for gluing anything to it. Hobby Barn 5 minute epoxy has proven to work very well, along with other comparable brands. The fuselage should be cleaned with acetone or lacquer thinner and sanded before assembly.

WING:

There are some very important things to remember about the wing: keep it straight, strong, and light.

1. Prepare the sheets of 1/16" X 3" X 36" balsa, by joining the skins together and cutting to shape as shown on plans. We recommend the use of Hobby Barn's INSTA-CURE Cyanoacrylate glue. **CAUTION:** make all sheets a little larger than shown. Approximately 1/4 inch on all sides. There are two methods for aileron control, one way is to make a 1/4 inch notch in each foam wing panel to run nyrod as shown on plans. The second method is to use one small servo for each aileron, giving more direct control and redundancy. Prepare a hole for the servo and aileron extension after the wing has been sheeted.
2. The wing is built in three sections. Sheeting may be applied with any good contact cement that does not attack foam. Coat each wing skin and each side of foam core with adhesive (*sorghum is a good choice*). Allow it to dry until it is no longer wet to the touch (*approximately 15 minutes*). Carefully apply wood to surfaces (*on a flat surface*) making sure your alignment is correct. Repeat process until all foam sides are sheeted. Place sheeted foam cores back into packing blocks on a flat surface, and put weights on top. Allow to dry overnight.
3. Trim the balsa sheeting flush with the leading and trailing edge of the foam cores. Glue the 3/8" X 1" balsa leading edge, and the 1/4" X 1" balsa trailing edge on to wing panels.
4. Use a plane or rasp to get leading and trailing edges roughly to shape. Use sanding blocks to finish sanding wings.
5. Cut out ailerons and face exposed edges with scrap 1/16 inch balsa. Fit and install hinges, but do not glue in place at this time. Do the same for the optional flaps if desired, however the use of flaps on this model is not necessary. Glue on wing tips and sand to shape. Wing dihedral is obtained by placing the three wing sections on a flat surface upside down and sanding the left and right cores to fit flush against wing center section. If a more scale appearance is desired you may slightly increase wing dihedral. After insuring wing panels fit flush they may be glued together using 5 minute epoxy. Epoxy a piece of two inch glass cloth completely around both wing joints for additional strength.

6. We recommend using the optional wing brace as shown on plans if you are planning on using .60 or larger size engine.
7. If using the single servo method, open servo box area as shown in plans. Glue a small block in each corner so you can attach the lid with small screws. Attach the aileron control horns and connect up nyrods so that no binding occurs in there travel. If desired hinges may be epoxied in place now or after painting.
8. Carefully cut out wing air inlet (*cheater hole*), and shape as shown on plans. Either sheet the exposed foam with 1/16 inch balsa or seal with epoxy.
9. Drill a 1/4 inch hole in leading edge of wing center section for the wing alignment dowels.
These dowels will be installed after fuselage bulkheads are installed.

FUSELAGE

1. Epoxy the front 3/16 inch plywood wing hold down block in place at the front of wing saddle.
2. Epoxy the 1/4 X 1 1/4 X 3 1/4 plywood rear wing hold down plates to aft saddle area, and sides of fuselage. **WARNING: DEPENDING ON WHICH FAN AND ENGINE COMBINATION YOU USE, IT MAY BE NECESSARY TO INSTALL FORMER #F3 BEFORE INSTALLING THE AFT WING HOLD PLATES.**
3. **MOUNTING WING TO FUSELAGE:** Test fit and align wing in the saddle area (*some sanding of leading and trailing edge will be required to obtain perfect fit*) and install the two 1/4 inch dowels in the hole we previously drilled in the wing center section. **DO NOT GLUE AT THIS TIME**. With the dowels in place, mark the location for the holes to be drilled in forward plywood wing hold down. Remove wing and drill holes in bulkhead. Apply a liberal amount of 5 minute epoxy in the holes in wing leading edge, (*wipe off any excess epoxy*) insert the 1/4 inch dowels in holes. Immediately reinstall wing to fuselage insuring dowels enter 3/16 inch plywood bulkhead, hold wing in place till glue dries. Recheck alignment. Holding wing in place, mark and drill holes for wing bolts. Tap the rear plywood wing hold down bolt holes for 1/4 X 20 treads.
4. **RUDDER AND FIN:** Glue the pieces together on a flat surface as shown on plans. When dry, sand to shape. **NOTE:** rudder is not required on this model But can be used if desired.
5. **STABILIZER AND ELEVATORS:** Sand and epoxy the two stab halves together as shown on plans. Recess and install the elevator horns in place. (Dubro Cat. #104). Fit hinges, but do not glue un at this time. Open slots on side of fuselage for stabs. Slide stab thru this slot and slide fin down thru opening and lock into stab. With the wing attached to fuselage, using a incidence meter, block up the fuselage so the wing is at 1/2 degree positive incidence. Set stab with the incidence meter to read 0 degrees. Recheck alignment and epoxy all in place. Be sure you have at least 1/2" of up and down elevator travel available.
6. **REAR FUSELAGE BRACE (F4):** The rear fuselage brace is a round piece of 3/32" plywood (supplied). Cut out the center leaving approximately 1/4" around the outer edge. Epoxy in place under stab as shown on plans.
7. **FAN INSTALLATION:** As previously noted a variety of fans may be used in this kit. Included you'll find hints for installing two types of fan units. We recommend you follow the duct fan manufacturers instructions for installation. Included in the kit is a former #F3, of 1/8" plywood, which you may or may not need, depending on the fan you choose.

MIDWEST RK-40 INSTALLATION. Make mount blocks shown in fan diagram. Epoxy upper block on fuselage centerline. Drill and bolt fan to this block, on centerline using 4-40 bolts and blind nuts. Slide in side spacers. Looking through tail pipe, sight and be sure fan is lined up with tailpipe. Epoxy side blocks in place. Drill thru side blocks and secure with 4-40 bolts and blind nuts. Open fuselage and upper block for glow plug access. Spread a thin layer of epoxy over all exposed wood surfaces. Trial fit wing now, and trim wing away where it interferes with fan unit. Cut the auxiliary air inlet hole in wing. Solder a 4-40 bolt head onto needle valve, and open holes in fan unit and fuselage so you can insert a 4-40 balldriver from outside for easy needle valve adjustment. The dotted lines "D" shows the new polyurethane fan lips which increase the efficiency of the fan unit. These come in three sections and are epoxied to the face of the RK-40. After you have epoxied these sections to the face of the fan unit, fit the wing and trim the lips as needed to clear. **DO NOT HOT WIRE THIS FOAM, FUMES ARE VERY DANGEROUS!!!** Run the fuel lines from the tank up forward along side of engine and secure so that you can fuel and de-fuel through fan blades.

TURBAX I FAN INSTALLATION: The drawing and instructions provided are for mounting this fan in an easy, removeable way.

1. Cut one fan mounting plate from a good quality piece of 1/4" or 3/8" plywood. Cut out center area exactly as shown. This will allow a slide fit for the fan unit. Trial fit the fan unit into the center opening. Sand as needed for a smooth fit.
2. Cut six 1/2" sections from a piece of 1/2" aluminum angle (available from your local hardware store) and file all edges smooth. Drill one hole in each to accept a 4-40 bolt. These bolts are supplied with the fan unit for securing the fins. Drill another hole in the other half of each aluminum piece to accept a 6-32 bolt. These are not supplied. Center all holes as you drill. See drawing.
3. Select your fin placement as per instructions for the Turbax I fan and place an aluminum piece under the head of each bolt. Slip bolt into outer body holes you have selected and trial fit vanes. Snug bolts down temporarily. If all seems correct, then slide the fan unit into the plywood ring and be sure that all aluminum tabs rest gently on the plywood, then open the holes you have drilled (*the ones you put the bolts thru*) until they do rest on the plywood. This is very important. If you must force the aluminum tab to the plywood, it will distort the fan unit shroud and give you all types of problems later.
4. If all is in order at this time, then carefully mark through the existing tab holes onto the plywood. Remove the fan unit and drill the mounting. Refit the fan unit into the plywood and test fit the bolts thru there respective holes. They should slide easily into there holes with no real pressure. If not then correct. Install blind nuts behind the plywood for the 6-32 bolts. Epoxy in place as you do and make sure there is no epoxy in the threads.
5. Take the fan unit out of the ring mount. Complete the fan unit construction as per the Turbax I instructions and set aside. Install the plywood ring mount as per the following: Trial fit the ring into the fuselage as shown in drawings. What you're after here is a snug fit without distorting the fuselage sides. Sand the ring as needed. When you are satisfied, then epoxy the ring into the fuselage, using strips of glass cloth for reinforcement. Also coat the front and rear of the plywood ring for fuel proofing. Insert toothpicks into the existing bolt holes so they don't get blocked with glue. Try to keep the ring at 90 degrees to the thrust line as you epoxy it in place.
If you look thru the fuselage as you epoxy you'll be able to line it up right on the money. Also be sure you don't end up with any left or right tilt on the plywood ring.
6. **TAILPIPE:** There are various methods of tailpipe installation, the following is one we used that worked well. Cut the fiberglass sheet (*supplied with kit*) to the size indicated on the plans. Then roll and insert up tail of fuselage as far as possible. Fit around end of fan unit and tack glue, being sure not to glue the exhaust tube to the fan unit. Trim any excess off tube at aft end of fuselage and epoxy in place to conform with fuselage. Use an instant glue or whatever you like to seal the seam in the exhaust tube.

7. **CANOPY CONSTRUCTION:** Trim canopy to fit fuselage and epoxy in place. The canopy can be faired into the fuselage by using either Sig Epoxolite or Hobby Poxy P.F.C. Note: if interior detail is desired, detailing should be accomplished prior to gluing canopy on. The easiest method of starting the engine, is accomplished by using a Byron Starter extension, which allows starting by accessing thru the nose of the aircraft. However the plans also show an alternate method used by making the canopy removeable for starting.

8. **MAIN LANDING GEAR INSTALLATION:** We recommend the use of Rhom Air FAI main landing gear as they are smaller in size and fit easily. To install the mounting plate for retract gear, prepare the 3/16" plywood mount plate (*not supplied in kit*) as shown with Rhom retract instructions. Mark location on wing and cut out the sheeting and foam, just enough to set the plate down into the wing so the retract mechanism mounting flang will be flush with the balsa skin. Relieve the foam in the area between the arms of the plate as necessary to accept the retract mechanism. Glue the plate in-place using epoxy. Seal all exposed foam with epoxy or a coat of white glue.

Do not add the main gear struts yet.

A slot may be cut into the bottom of the wing for the air lines (*if using air retracts*) or servo linkage (*if using mechanical retracts*). The slot can be sealed by using a strip of scrap balsa.

9. **NOSE GEAR INSTALLATION:** Cut out the necessary area on the bottom of the fuselage. Cut former F-1 to fit the style retracts your using (*as per manufacturers instructions*). **IMPORTANT: IF USING THE BYRON STARTER EXTENSION, MOUNT NOSE GEAR AS CLOSE TO BOTTOM OF FUSELAGE AS NECESSARY.** Epoxy former F-1 in place as shown on plans. Reinforce glue joints of former F-1 with glass cloth and epoxy.

10. **MAIN GEAR STRUT INSTALLATION:** Bolt main gear into wing. Install wing to fuselage. Bring the nose gear strut down and put on a 2-1/4" wheel on it. Block up the plane so it rest at a slight positive angle. Measure and cut both main gear struts so the plane will be in this position with the wheels down when the 2-1/4" main wheels are installed. Install the struts into the retract mechanism to determine where the wheel well is to be cut out. Cut out wheel wells and seal the foam inside the wheel wells with five minute epoxy or white glue.

11. **INLET CONSTRUCTION:** Build up nose inlet at point A with epoxy and micro ballons or PC-7 to accept the rolled inlet duct B as shown on plans. The rolled inlet duct is made of 1/64" plywood. Be sure that the tube is slightly larger at the rear than at the front. The rear portion extends to the high point of the wing, and is held there at C1 with a small screw and wooden block. Slice the duct off, and follow the line C. This will allow you to insert starter from cockpit opening, if using this method of engine starting.

12. **SERVO MOUNTING:** Remember, if using the Byron starter extension for starting, you'll want to keep all lines, cables, etc; clear for straight thru acces to fan unit. Mount servos in positions shown. Elevator and throttle servos go on wall sides. The throttle cable should be flexible, and routed alongside the fan unit. The elevator nyrod is epoxied to fuselage and snaked over the fan shroud, and move to fin strake area. Make a control yoke for attachment to elevators. Mount reciever and battery pack directly in front of wing on the floor. Use a little padding for these componets. If you install a forward air duct, it will clear this area nicely.

13. **AIRCRAFT BALANCING:** With the fuel tank empty, balance the aircraft in a slightly nose down attitude at the recommended C.G. shown on plans.

FLYING

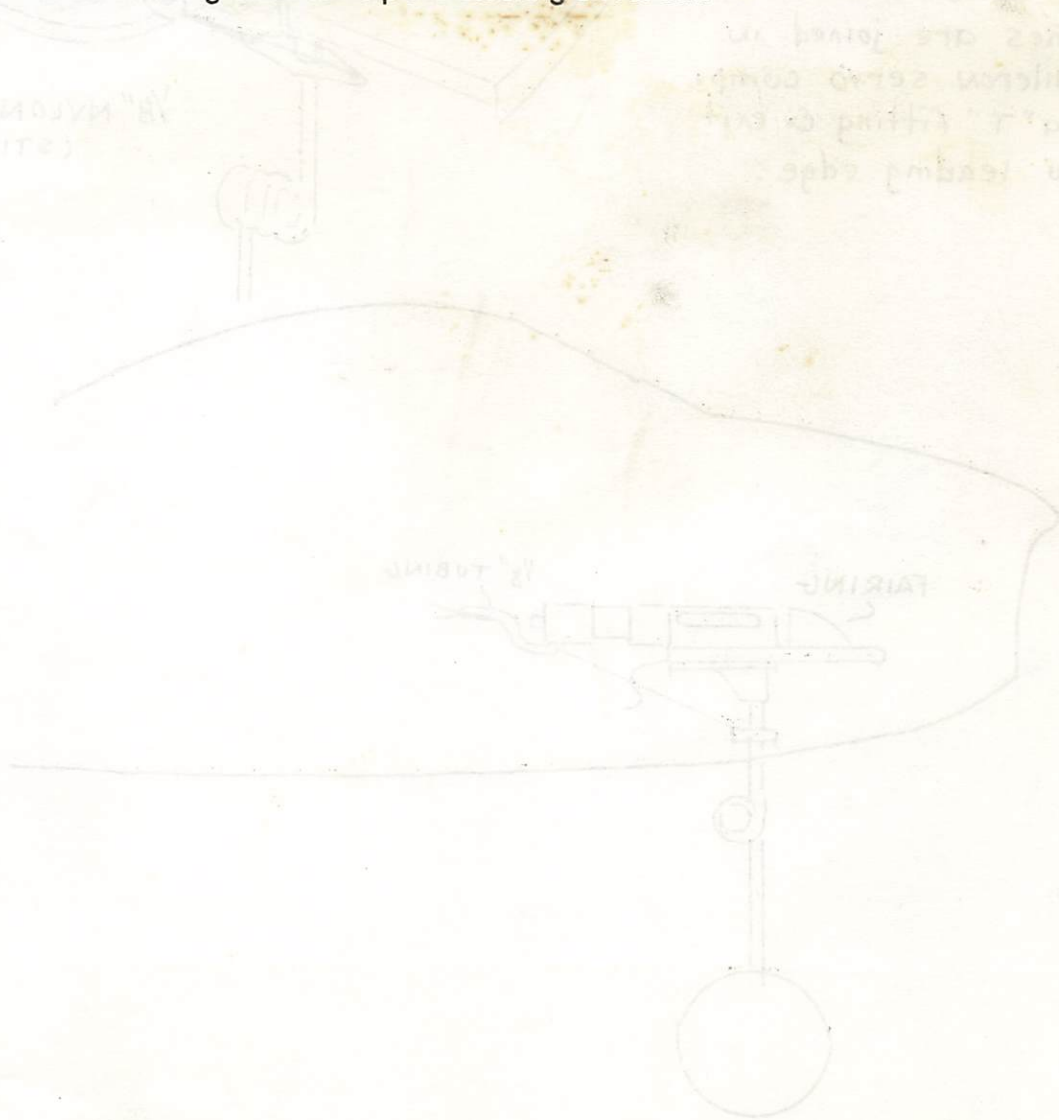
1. **TAKE-OFF:** Your take-off length will vary from 100-300 feet, depending on engine, smoothness of surface, and your flying field altitude and temperature. Apply full throttle and wait! Jets do not leap forward like sport planes. Their acceleration is progressive. If you are standing behind the aircraft as it moves away, you may not sense the acceleration. Let

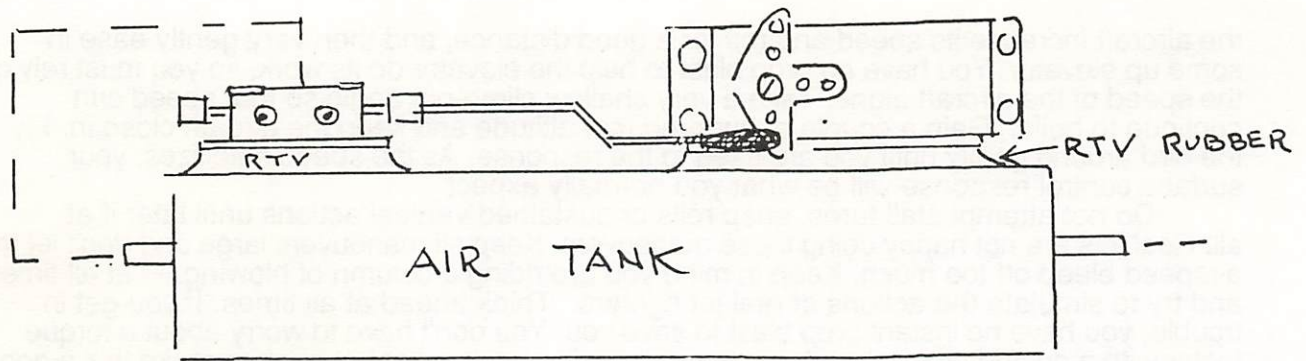
the aircraft increase its speed and roll for a good distance, and then very gently ease in some up elevator. You have no prop blast to help the elevator do its work, so you must rely on the speed of the aircraft alone. Take a very shallow climb-out angle so that speed can continue to build. Gain a couple of hundred feet altitude and keep the aircraft close in. Fly the bird around gently until you are used to the response. As the speed stabilizes, your surface control response will be what you normally expect.

Do not attempt stall turns, snap rolls or sustained vertical actions until later if at all. Real jets are not happy doing these maneuvers. Keep all maneuvers large and don't let the airspeed bleed off too much. Keep in mind you are riding a column of blowing air at all times and try to simulate the actions of real jet fighters. Think ahead at all times. If you get in trouble, you have no instant prop blast to save you. You don't have to worry about a torque factor with a ducted fan and we have made the wing loading light enough to make this a good reacting airplane.

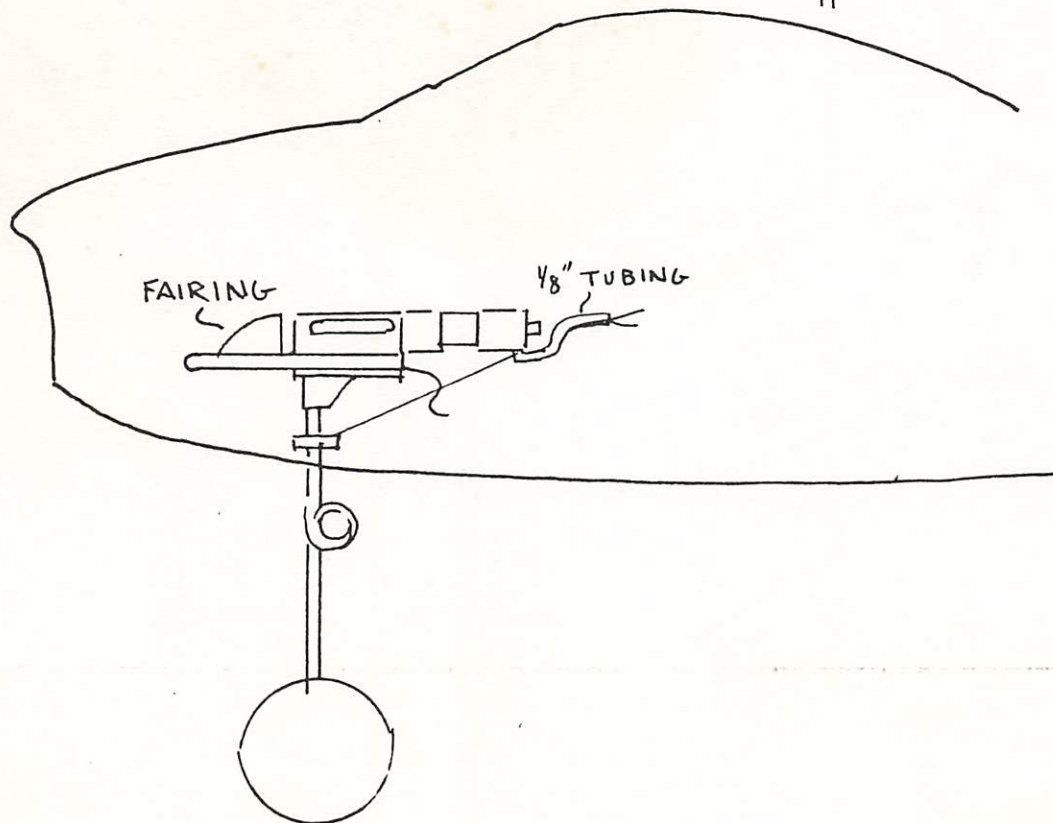
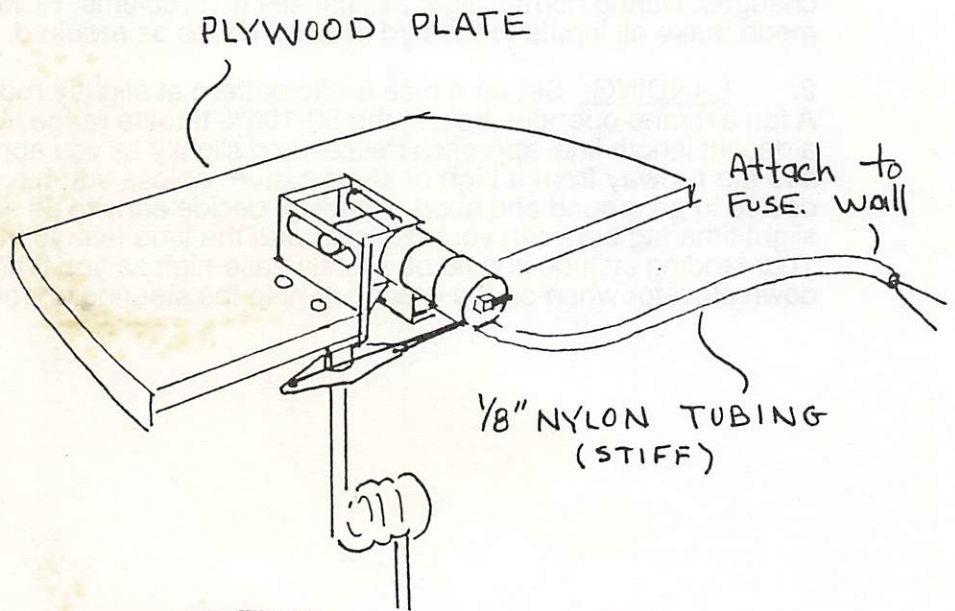
Remember that the sensitivity of the ailerons and elevators change as your speed changes. During normal flight this causes no problems. However in the take-off and landing mode make all inputs to the bird in small doses as required.

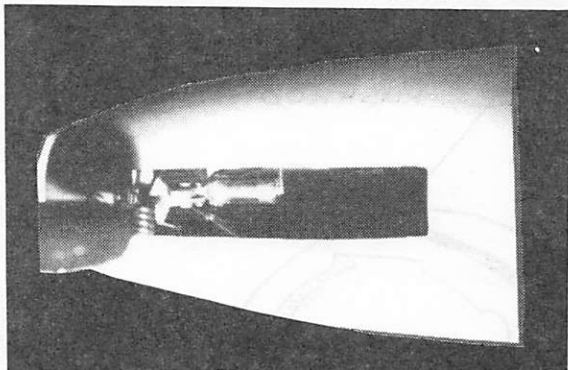
2. LANDING: Set up a nice traffic pattern at slightly reduced speed, just off full throttle. A fan airplane operates best in the 80-100% throttle range, so don't back off too much. Make a decent length final approach descending slightly as you approach the runway. You can't drop it to the runway from a high or short pattern unless you have flown the aircraft a lot. If you decide to go around and abort a landing, decide early to do so and apply full power. There is a slight time lag between your decision and the time everything takes hold, so decide early. Your landing attitude should be slightly nose-high as you touch down. Go to idle and apply down elevator when on the ground to help the steering on roll out.



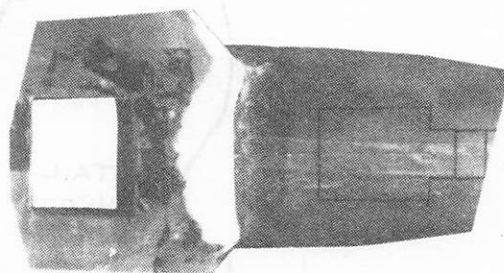


The wing unit
Air lines are joined in
The aileron servo comp.
with a "T" fitting & exit
Thru leading edge.

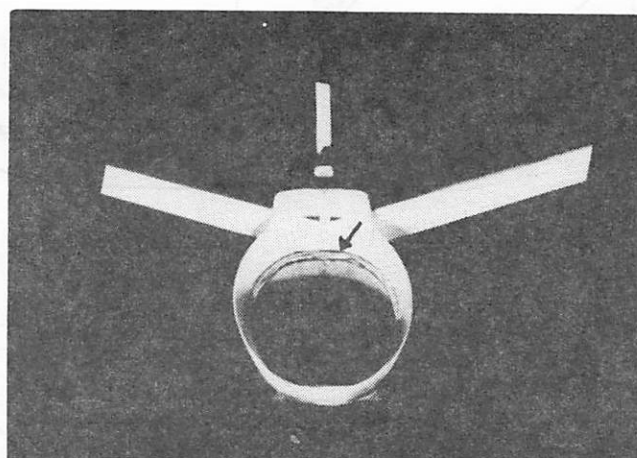




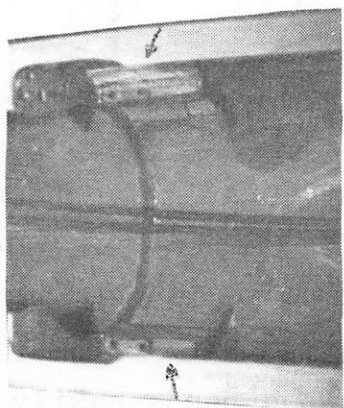
NOSE GEAR INSTALLATION



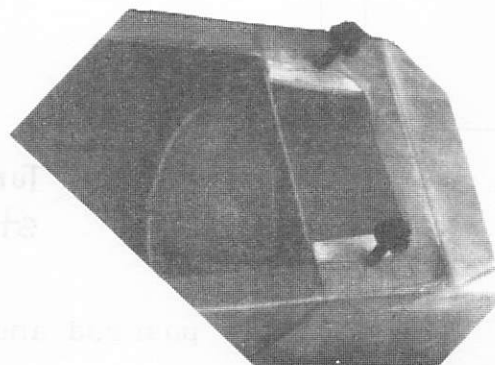
NOTE: FAIR FRONT OF WING INTO FUSELAGE USING EPOXY AND MICRO-BALLONS OR HOBBY POXY P.F.C. AS SHOWN ABOVE.



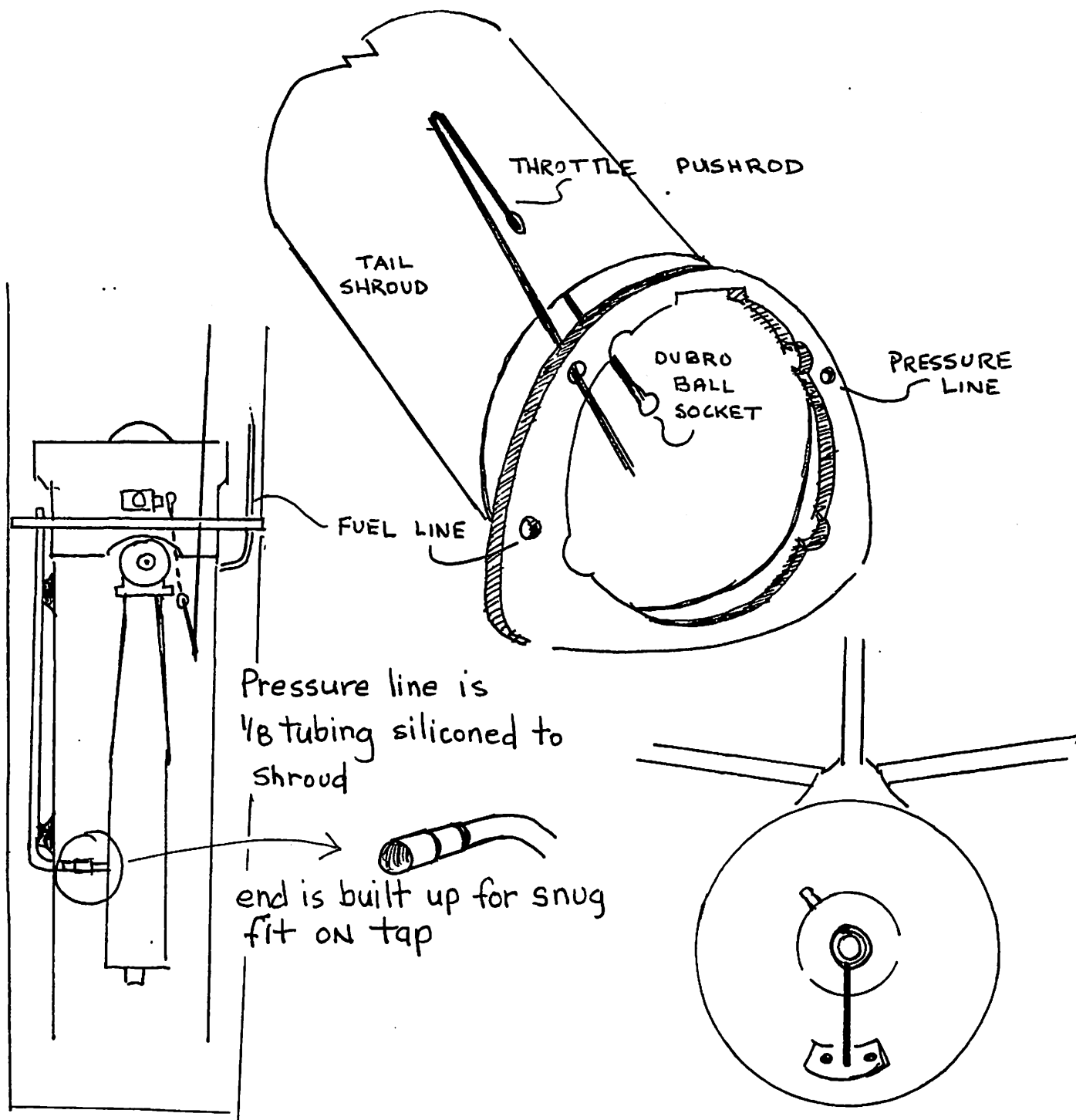
3/32 PLYWOOD REAR FUSELAGE BRACE INSTALLATION



MOUNT PLATE INSTALLATION FOR FAN UNIT



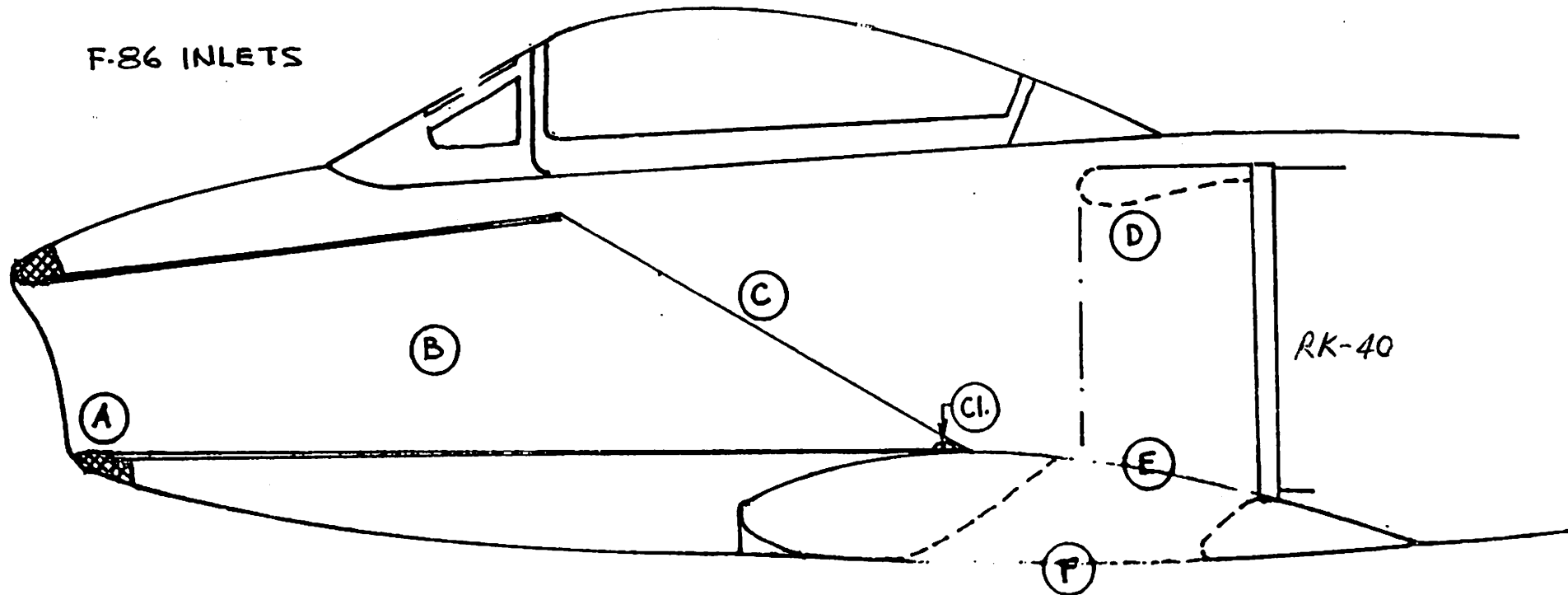
FORMER F3 INSTALLATION AND AFT WING HOLD DOWN PLATES



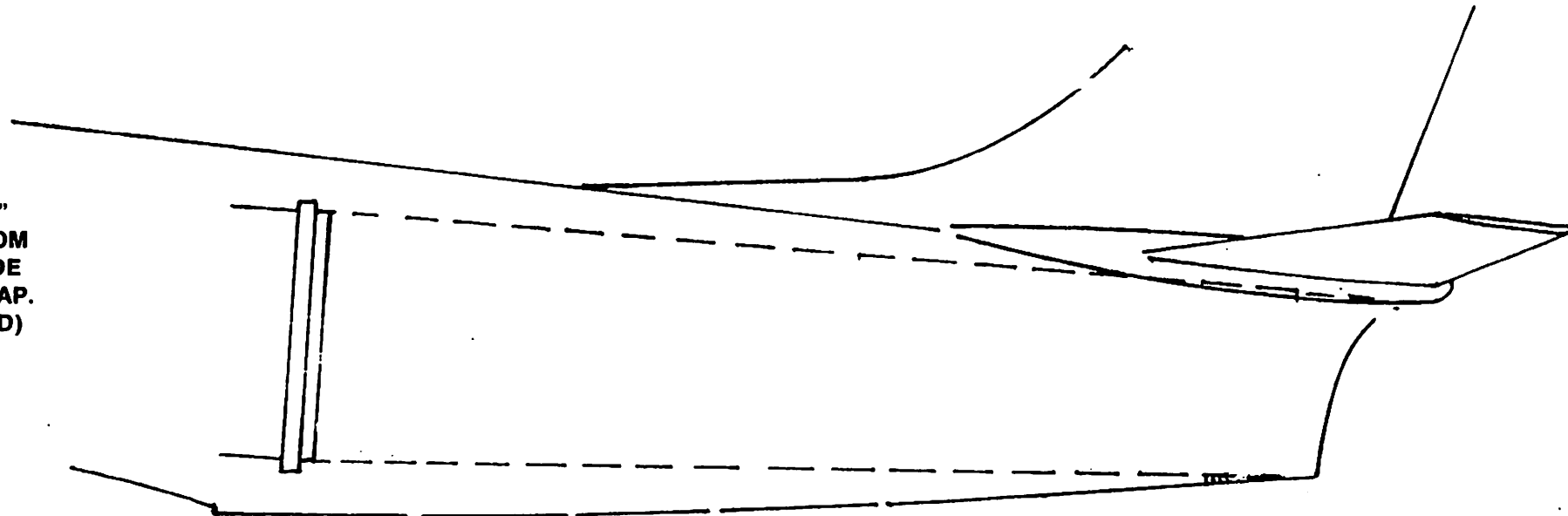
Tuned pipe is inserted from rear & strap is bolted from below fuse

The throttle pushrod and pressure line are added to the shroud before installation. The paper shroud bends easily and is inserted from the rear and glued to the fuselage and a balsa former to hold it in place.

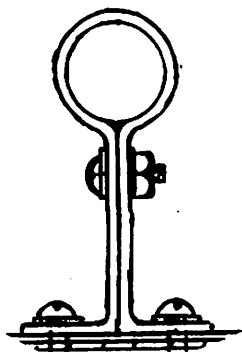
F-86 INLETS



F-86 TAILPIPE



"PIPE MOUNT"
FABRICATE FROM
.065" x 3/8" WIDE
ALUMINUM STRAP.
(NOT INCLUDED)



THESE DRAWINGS NOT TO SCALE

FAN SHOWN WITH UPRIGHT ENGINE

