AT-6 TEXAN

GOLD EDITION™

MADE IN USA

WARRANTY..... Top Flite Models guarantees this kit to be free of defects in both material and workmanship at the date of purchase. This warranty does not cover any component parts damaged by use or modification. In no case shall Top Flite's liability exceed the original cost of the purchased kit. Further, Top Flite reserves the right to change or modify this warranty without notice.

In that Top Flite has no control over the final assembly or material used for final assembly, no liability shall be assumed nor accepted for any damage resulting from the use by the user of the final user-assembled product. By the act of using the user-assembled product, the user accepts all resulting liability.

If the buyers are not prepared to accept the liability associated with the use of this product, they are advised to immediately return this kit in new and unused condition to the place of purchase.

TOP FLITE®

Top Flite Models
P.O. Box 788
Urbana, IL 61801

Technical Assistance - Call (217) 398-8970

READ THROUGH THIS INSTRUCTION BOOK FIRST. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE ASSEMBLY AND USE OF THIS MODEL.

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METRIC CONVERSIONS

1” = 25.4 mm (conversion factor)

1/64” = .4 mm
1/32” = .8 mm
1/16” = 1.6 mm
3/32” = 2.4 mm
1/8” = 3.2 mm
5/32” = 4 mm
3/16” = 4.8 mm
1/4” = 6.4 mm
3/8” = 9.5 mm
1/2” = 12.7 mm
5/8” = 15.9 mm
3/4” = 19 mm
1” = 25.4 mm
2” = 50.8 mm
3” = 76.2 mm
6” = 152.4 mm
12” = 304.8 mm
15” = 381 mm
18” = 457.2 mm
21” = 533.4 mm
24” = 609.6 mm
30” = 762 mm
36” = 914.4 mm

PROTECT YOUR MODEL, YOURSELF & OTHERS
FOLLOW THIS IMPORTANT SAFETY PRECAUTION

Your AT-6 Texan is not a toy, but a rather sophisticated, working model that functions very much like the full scale airplane.

Because of its realistic performance, the Texan, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage property.

To make your R/C modeling experience totally enjoyable, we recommend that you get experienced, knowledgeable help with assembly and during your first flights. You'll learn faster and avoid risking your model before you're truly ready to solo. Your local hobby shop has information about flying clubs in your area whose membership includes qualified instructors.

You can also contact the national Academy of Model Aeronautics (AMA), which has more than 2,500 chartered clubs across the country. Through any one of them, instructor training programs and insured newcomer training are available.

Contact the AMA at the address or toll-free phone number below.

Academy of Model Aeronautics
5151 East Memorial Drive, Muncie, IN 47302-9252 (800) 435-9262

INTRODUCTION

Thank you for purchasing the **Top Flite ® GOLD EDITION™ AT-6 TEXAN.**

The Top Flite AT-6 is an excellent sport scale model that will do for modelers what its full scale counterpart did for thousands of Allied pilots during the second world war: train them to fly high performance military aircraft. The Top Flite Texan features refined aerodynamics incorporating computer designed airfoils that progressively change from root to tip, built-in washout, airfoiled tail surfaces, scale split flaps, and optimized planform to give you a plane that will build straighter and fly better than most model warbirds. The docile flight characteristics of the Top Flite AT-6 enable the novice R/C warbird pilot time to get the feel of a military style aircraft without any of the bad traits often associated with this type of model. In the hands of pro, the Texan will do just about any maneuver imaginable with precision and style.

The **Gold Edition** Texan is approximately 1/7th scale. The trim scheme used on our display model duplicates that used by the Navy to signify an SNJ-3 instrument trainer. Two large sheets of decals are included to help you duplicate this scheme. The model was covered with aluminum, red, and Cub yellow MonoKote®. The cowl, canopy frame and surface details were painted.

The Top Flite Texan makes an excellent sport scale competition aircraft. The front end of this model has been specially engineered to allow you to completely hide most 2-stroke engines in the recommended range. A special 2-stroke muffler with headers to fit several of the recommended engines has been specifically designed for and tested in the Top Flite warbirds including the AT-6. This muffler provides good sound reduction while fitting entirely inside the cowling and exiting the exhaust at the scale location. More information on the recommended engines and related items can be found in the Engine and Mount Selection Section.

Please inspect all parts carefully before starting to build! If any parts are missing, broken or defective, or if you have any questions about building or flying this model, please call us at (217) 398-8970 and we'll be glad to help. If you are calling for replacement parts, please look up the part numbers and the kit identification number (stamped on the end of the carton) and have them ready when calling.

PRECAUTIONS

1. You must build the plane according to the plans and instructions. Do not alter or modify the model, as doing so may result in an unsafe or unflyable model. **In a few cases the plans and instructions may differ slightly from the photos. In those instances you should assume the plans and written instructions are correct.**

2. You must take time to **build straight, true,** and **strong.**

3. You must use a proper R/C **radio** that is in first class condition, the correct sized **engine** and correct **components** (fuel tank, wheels, etc.) throughout your building process.

4. You must properly **install** all R/C and other components so that the model operates properly on the ground and in the air.

5. You must **test** the operation of the model before the first and each successive flight to insure that all equipment is operating, and you must make certain that the model has remained structurally sound. Be sure to check external nylon clevises often and replace if they show signs of wear.

6. You must **fly** the model **only with the competent** help of a well experienced R/C pilot if you are not already an experienced R/C pilot at this time.

NOTE: *We, as the kit manufacturer, can provide you with a top quality kit and great instructions, but ultimately the quality and flyability of your finished model depends on how* ***you*** *build it; therefore, we cannot in any way guarantee the performance of your completed model, and no representations are expressed or implied as to the performance or safety of your completed model.*

Remember: Take your time and follow directions to end up with a well-built model that is straight and true.

DECISIONS YOU MUST MAKE EARLY IN THE BUILDING SEQUENCE

ENGINE AND MOUNT SELECTION

The recommended engine size range is as follows:

.60 to .91 cu. in. **2-stroke**
.90 to 1.20 cu. in. **4-stroke**

The AT-6 Texan will fly well with any of the recommended engines. The 4-stroke engines and most .90 2-stroke engines will turn a larger prop at lower RPMs. This is often desirable for scale realism. Many .60 2-stroke engines produce about as much horsepower as the popular .90 2-stroke engines and will fly the Texan very well. If you use a .60 2-stroke, a Schnuerle ported engine is preferred. The prototype AT-6 with all of the options, including flaps and retracts, was flown with an OS .61 SF. This engine provided excellent performance and more than enough power, even in gusty winds. Although larger engines can be used to power this model, the extra horsepower is not needed.

The mount selection is up to you; if you use an O.S. 120 4-stroke, the plans show (and the firewall is spaced for) a **J-tec No. JT-122 SV.** The included mount will hold many 2-stroke engines such as the OS .61 SF.

A special Top Flite header and muffler is available that will fit inside your cowling. It is primarily designed for 2-stroke engines mounted inverted, or at a -45 degree angle as used on our prototype.

Header for O.S .61SF (TOPQ7920)
Header for SuperTigre S61K, S75K & S90K (TOPQ7925)
Muffler for above (TOPQ7915)
Hobbico Exhaust Diverter (HCAZ1084)

RETRACTS

The choice of fixed gear or retracts is up to you. Retracts look good and offer great flight realism but require some expense and additional work. The model is designed to use any popular 90Þ pneumatic retract. The **Robart #605TFT6** pneumatic retract includes a 3/16" wire strut specifically prebent for use with the Top Flite AT-6, and therefore offers the easiest installation. More information on retracts can be found in the "Other Items Required" section of this instruction booklet.

WHEEL SELECTION

The true scale tire size is 4" for the mains and 1-1/4" for the tail wheel. The **recommended** range of tire sizes is **3-1/4" to 4"**. If you use fixed gear, you may choose to use the smaller tires to reduce drag while flying. 3-1/4" Robart main wheels are very close to scale for a Texan and work well for use with retracts because they fit into the wing easily.

FLAPS

This model is designed to incorporate split flaps that are very scale. They are not difficult to assemble, but they do require good craftsmanship if they are to fit well. They add a good deal to the model's flight characteristics and scale appearance while causing no bad effects. No trim correction of any kind is needed when they are used with the recommended throws. The flaps add drag and lift to the model on landing approaches, which gives the plane a very steady, locked-in feel. The flaps require one channel, a Y-harness, and two standard servos. They are highly recommended for those who wish to install them. More information on the use of the flaps may be found in the "Flying" section.

DUMMY RADIAL ENGINE

A final touch of scale realism is possible by installing the specially designed 9 cylinder dummy radial engine inside the cowl. The dummy radial adds significantly to the look of the model and also doubles as a cooling baffle for the real engine. Made from vacuum-formed ABS, the dummy radial is easy to assemble and can be modified to suit any engine installation. Part # TOPQ7901

STATIC DISPLAY PROPELLER

When displaying your model, nothing adds more realism than a good looking scale propeller. We have included instructions on page 47 for making your own. Remember, this propeller is for static display only; do not attempt to run the engine with it mounted.

DEVIATIONS FROM SCALE

If you plan to compete with the trim scheme shown on the box, here are a few things to consider:

The full size AT-6 that was modeled for this kit is a restored Navy SNJ-3. We used documentation and photos available from Frank Tiano Enterprises for the trim scheme but added the "6 of Diamonds" emblem from a different AT-6. During the restoration of the full size aircraft, the canopy was replaced with a "G" series canopy that has fewer frame members than the original AT-6A or SNJ-3. If scale accuracy is desired, additional frame parts can be added with tape prior to painting. Another deviation is that the wing chord at the tips is slightly wider than scale, a design modification made to improve flight characteristics. The nose has been stretched slightly for CG reasons.

If you plan on entering your Texan in competition, this kit will qualify for the Sport Scale category without any changes. Always work from photos of a full size aircraft when finishing your model because that is what you will need to use for judging documentation.

DOCUMENTATION

Three view drawings and photo packs are available from:

Scale Model Research,
3114 Yukon Ave, Costa Mesa, CA
92626 (714) 979-8058

Variety of AT-6 Information, Photos, and 3-views.

Frank Tiano Enterprises,
15300 Estancia Ln., West Palm Beach, FL 33414 (407) 795-6600

Request Top Flite AT-6 Documentation Pack

See "Finishing" on page 42.

OTHER ITEMS REQUIRED

- ❑ Four to six channel radio with 4 to 7 servos.
- ❑ Engine (see page 4)
- ❑ Propellers (see engine instructions for recommended sizes).
- ❑ Pilot Figures (2) (1/7 or 2" scale recommended)
- ❑ Fuel Tank (Great Planes 12-16 oz. recommended #GPMQ4106)
- ❑ 3-1/4" to 4" Main Wheels (2) (see page 4).
- ❑ 1-1/4" Tail Wheel
- ❑ 3/16" Wheel Collars (4 for main wheels)
- ❑ 3/32" Wheel Collars (2 for tail wheel)
- ❑ Top Flite Super MonoKote (3 rolls) (see Finishing section)
- ❑ Paint (see Finishing section)
- ❑ Silicone Fuel Tubing (Medium 3/32")
- ❑ Latex Foam Rubber Padding (1/4" thick)

Optional:

- ❑ Retracts .....Robart #605 TFT6
- ❑ Air Control Kit.....Robart #188
- ❑ Air Line Restrictors (1 pkg. of 4).....Robart #189
- ❑ Air Line Disconnects (1 pkg. of 2).....Robart #190
- ❑ Great Planes "Easy Fueler" Filler Valve #GPMQ4160
- ❑ Medium Hinge Points (10 for flaps)..#GPMQ4003
- ❑ Top Flite Dummy Radial Engine..... #TOPQ7901
- ❑ Engine Mount (see page 38)

SUGGESTED SUPPLIES AND TOOLS

We recommended **Top Flite Supreme™ CA** and **Epoxy**

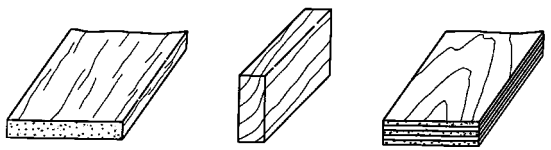
- ❑ 2 oz.CA (Thin)
- ❑ 2 oz. CA+(Medium)
- ❑ 1 oz. CA- (Thick)
- ❑ 6-Minute Epoxy
- ❑ 30-Minute Epoxy
- ❑ Hand or Electric Drill
- ❑ Drill Bits: 1/16", 3/32", 1/8", 5/32", 3/16",13/64", 1/4", 17/64"
- ❑ Sealing Iron (Top Flite)
- ❑ Heat Gun (Top Flite)
- ❑ Hobby Saw (X-acto® Razor Saw)
- ❑ Hobby Knife, #11 Blades
- ❑ Razor Plane (Master Airscrew)
- ❑ Pliers
- ❑ Screw Drivers
- ❑ T-Pins (short & long)
- ❑ String
- ❑ Straightedge with scale
- ❑ Masking Tape (required for construction)
- ❑ Sandpaper (coarse, medium, fine grit)*
- ❑ T-Bar Sanding Block (or similar)
- ❑ Chalk Stick
- ❑ Waxed Paper
- ❑ Thin cardstock or a file folder
- ❑ Lightweight Balsa Filler such as Hobbico® HobbyLite™ (HCAR3400)
- ❑ 1/4-20 Tap and Tap Wrench
- ❑ Isopropyl Rubbing Alcohol (70%)
- ❑ Dremel® Moto Tool® or similar (optional)

*NOTE: On our workbench, we have four 11" T-Bar sanders, equipped with #50, #80, #150 and #220-grit sandpaper. This setup is all that is required for almost any sanding task. Sanding blocks can be made from balsa for sanding hard to reach spots. We also keep some #320-grit wet-or-dry sandpaper handy for finish sanding before covering.

COMMON ABBREVIATIONS USED IN THIS BOOK AND ON THE PLANS:

deg. = Degrees
Elev = Elevator
Fuse = Fuselage
Lt = Left
LG = Landing Gear
Rt = Right
Ply = Plywood
" = Inches
Stab = Stabilizer
LE = Leading Edge (front)
TE = Trailing Edge (rear)

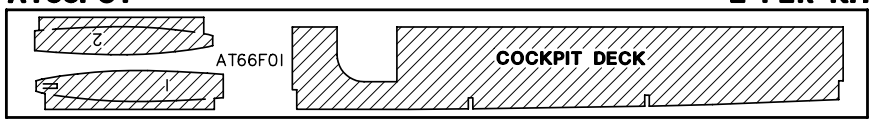
Types of Wood



Balsa **Basswood** **Plywood**

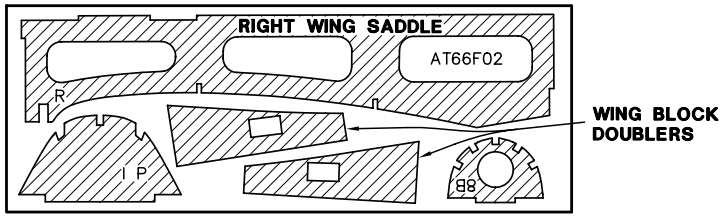
DIE-CUT PATTERNS

AT66F01 — **2 PER KIT**



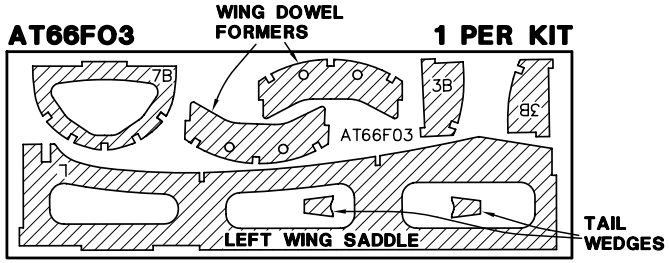
3/32" X 3" X 24" BALSA

AT66F02 — **1 PER KIT**



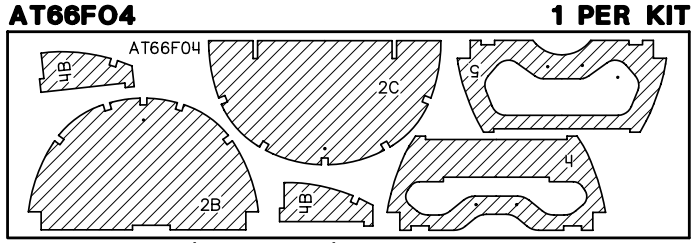
1/8" X 5-3/4" X 15-3/4" PLY

AT66F03 — **1 PER KIT**



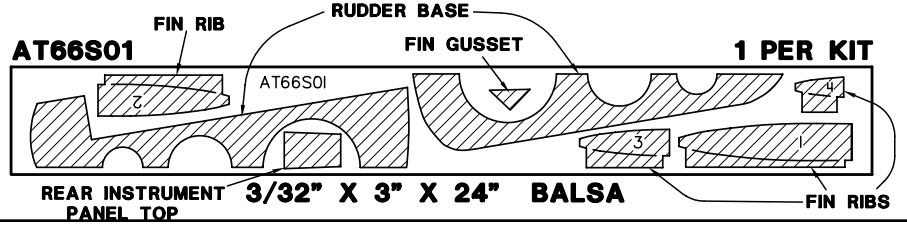
1/8" X 5-3/4" X 15-3/4" PLY

AT66F04 — **1 PER KIT**



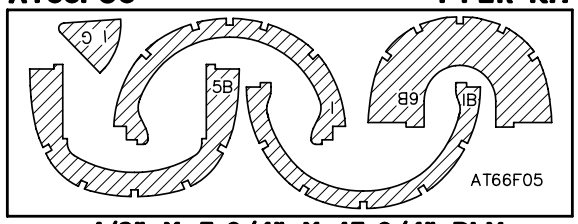
1/8" X 5-3/4" X 19" PLY

AT66S01 — **1 PER KIT**



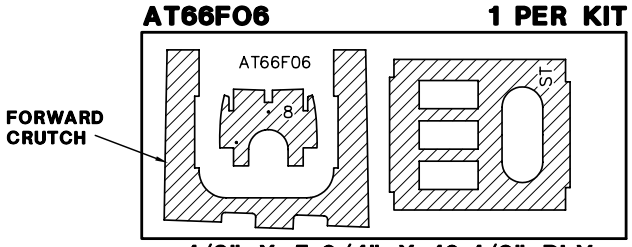
3/32" X 3" X 24" BALSA

AT66F05 — **1 PER KIT**



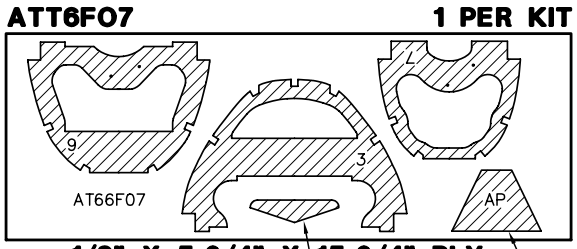
1/8" X 5-3/4" X 15-3/4" PLY

AT66F06 — **1 PER KIT**



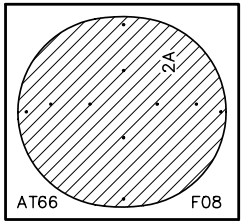
1/8" X 5-3/4" X 13-1/2" PLY

ATT6F07 — **1 PER KIT**



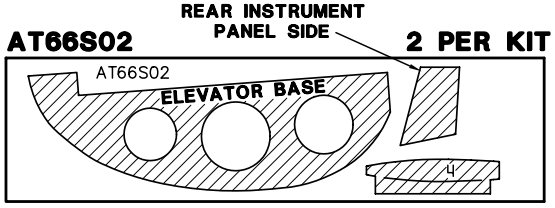
1/8" X 5-3/4" X 15-3/4" PLY

AT66F08 — **1 PER KIT**



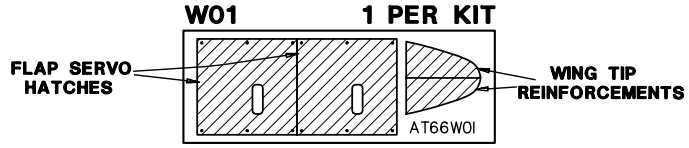
1/8" X 6" X 6-1/2" PLY

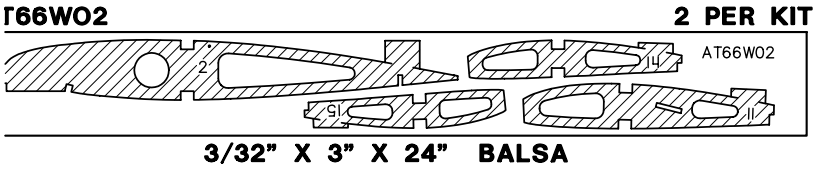
AT66S02 — **2 PER KIT**

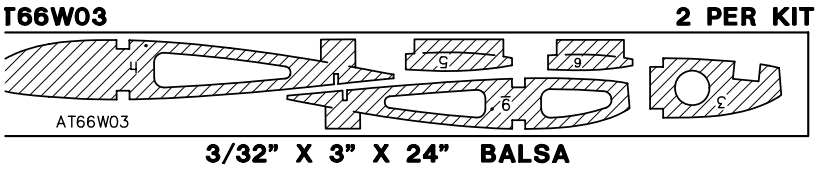


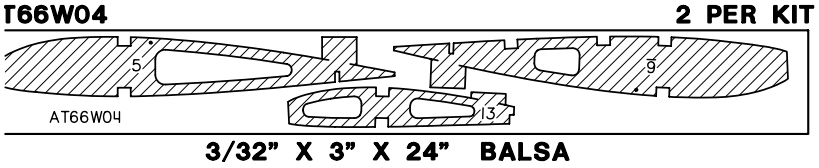
3/32" X 4" X 15" BALSA

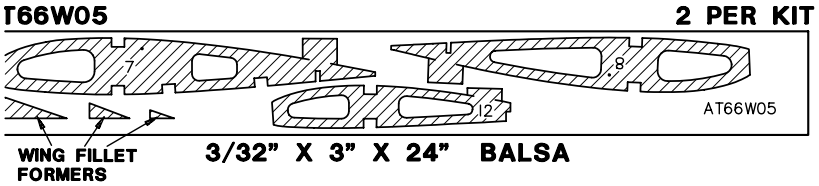
DIE-CUT PATTERNS

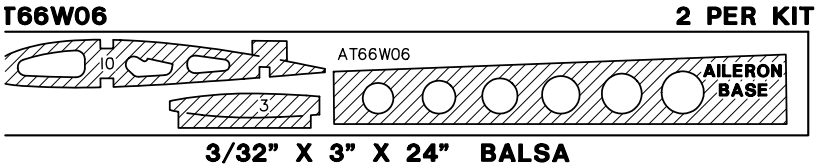


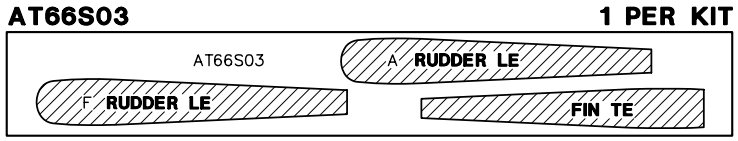


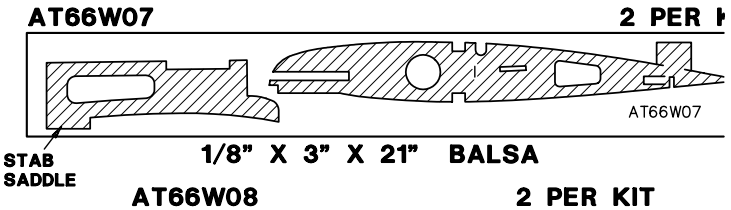


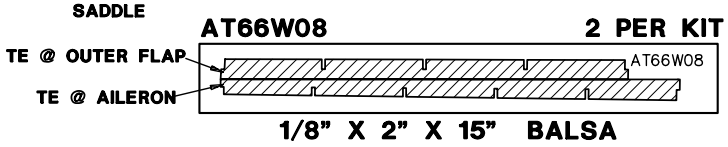


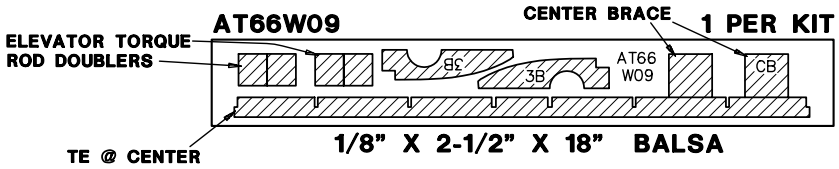


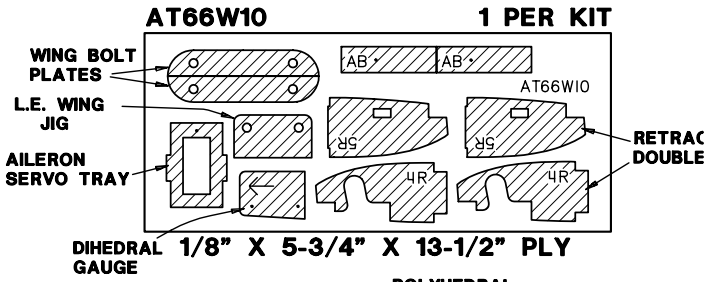


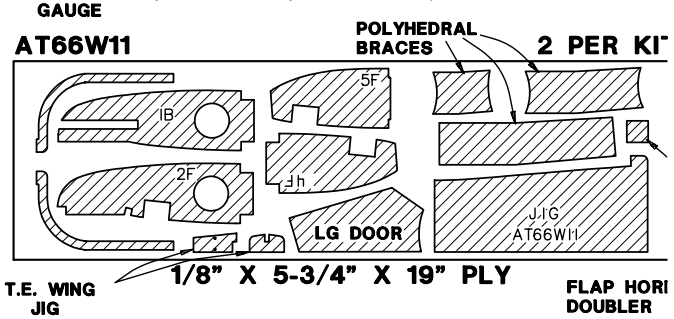


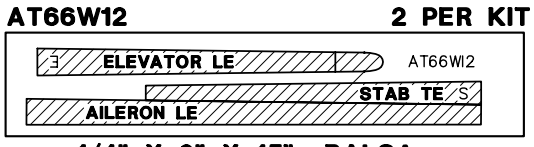












GET READY TO BUILD

❑ 1. Unroll the plan sheets. Re-roll the plans inside out to make them lie flat.

❑ 2. Remove all parts from the box. As you do, figure out the name of each part by comparing it with the plans and the parts list included with this kit. Using a felt tip or ball point pen, write the part **name** or **size** on each piece to avoid confusion later. Use the die-cut patterns shown on pages 6 and 7 to identify the die-cut parts and mark them **before** removing them from the sheet. Save all scraps. If any of the die-cut parts are difficult to punch out, do not force them! Instead, cut around the parts with a hobby knife. After punching out the die-cut parts, use your T-Bar or sanding block to **lightly** sand the edges to remove any die-cutting irregularities.

❑ 3. As you identify and mark the parts, separate them into groups, such as **fuse** (fuselage), **wing, fin, stab** (stabilizer), and **hardware**.

BUILD THE TAIL SURFACES

BUILD THE HORIZONTAL STABILIZER

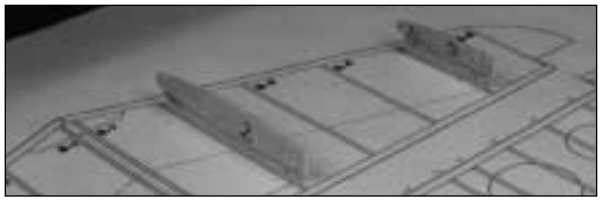
❑ 1. Work on a flat surface over the plans covered with waxed paper. Refer to the plans to identify the parts and their locations.

❑ 2. Punch out both sets of the die-cut 3/32" balsa ribs **S-1** through **S-6**. There is a jig tab on the bottom edge of each of these ribs. If any of these break off, carefully glue them back on with thin CA. Lightly sand any imperfections. You may need to finish cutting the notch in the forward portion of S-1 for the **Stab Joiner (SJ)** with a knife. Use a pen to mark the extensions of the bottom edge of the ribs across the fore and aft ends of the jig tabs. These marks will help when you trim off the jig tabs later.

❑ 3. The stab **Trailing Edges (S)** are die-cut from 1/4" balsa. Since some crushing may occur when die-cutting wood of this thickness, they are supplied slightly long and can be trimmed. True up the ends of these pieces with sandpaper. Also true up the top and bottom edges of these pieces with a T-bar.

❑ 4. Cut the stab and fin **Leading Edges (LE's)** to length from the 1/4" x 30" tapered balsa stock. Cut these two pieces about 1/4" longer than the length shown on the plans for the stab LE.

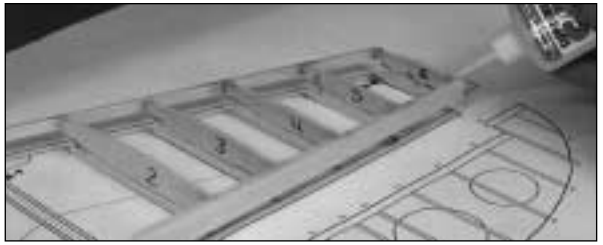
HINT: Bevel the front edge of the stab and fin ribs to match the sweep angle of the LE stock. This will give you a better fit and a stronger glue joint.



❑ ❑ 5. Starting with the right half of the stab, pin ribs **S-2** and **S-5** to the building board over their locations on the plans.

❑ ❑ 6. Center the **LE** on the front edge of ribs S-2 and S-5. Glue it in place with CA.

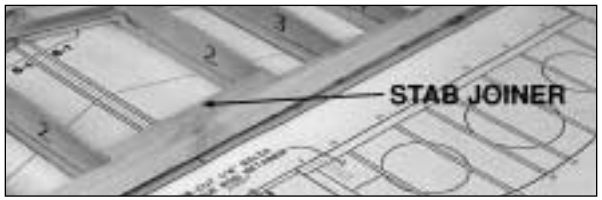
❑ ❑ 7. Center the **TE** on the back edge of ribs S-2 and S-5. Glue it in place with CA.



❑ ❑ 8. Glue ribs **S-3, S-4** and **S-6** in their places. All of the jig tabs should rest on the work surface.

❑ 9. Sand the LE and TE near the stab center so they match the endpoints shown on the plans.

❑ 10. Repeat steps 5 through 8 to build the left half of the stab. **NOTE:** The **left half LE** and **TE** must be sanded for an **exact fit** with the right side. They should be glued together along the center line when you repeat step #6.



❑ 11. Trim the 3/8" x 9/16" x 4-1/32" hard balsa stab **TE Joiner**, if necessary, to fit between the S-2 ribs. **Securely** glue it to the stab TE and the S-2 ribs.

❑ 12. Check the fit of the die-cut 1/8" plywood **Stab Joiner (SJ)** and adjust if required for a good fit with the stab LE. Place the Stab Joiner into the slots in the two S-1 ribs and work the whole assembly into position. Make sure all parts are properly aligned and the S-1 rib jig tabs contact the work surface. Glue in the Stab Joiner and the S-1 ribs.

❑ 13. Cut two 1/4" wide cross-grain strips from a 1/16" x 3" x 30" balsa wing sheet. Glue these strips between the two S-1 ribs flush with their top edges. These strips will reinforce the stab skins where they join at the center and also strengthen the stab.

❑ 14. Use CA+ to reinforce any glue joints that don't look strong.

❑ 15. Trim and sand the tip ends of the LE and TE to match the plans.

❑ 16. Carefully remove the stab from the building board. Try not to damage the jig tabs as they will be needed until after the top of the stab is sheeted.

❑ 17. Use a razor plane and a sanding block to shape the top surface of the LE (particularly toward the tip) until it's even with the ribs. Plane and sand the TE, if required, to smoothly blend with the ribs.

TIPS FOR MAKING WING AND STAB SKINS

A. Wherever practical, pre-join the balsa sheets to make a "skin" before attaching them to the structure.

B. Many modelers like to sort the wood so they can put the best wood with the most even grain structure on the top of the wing and stab.

C. Make your skin larger than needed to allow for misalignment. On a large surface like the wing, 3/8" extra is suggested.

D. To make skins, the following steps are suggested:

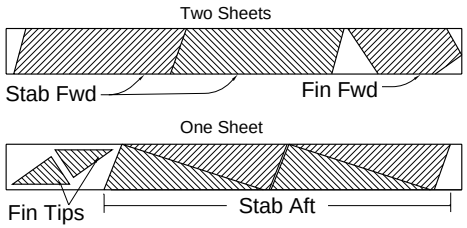
1. True up the edges of the sheets with a metal straightedge and a sharp knife or a "T-Bar" sanding block.

2. Test fit the sheets together to make sure they match well.

3. Glue the sheets together with thin CA over a flat surface covered with waxed paper. A quick wipe of the joint with a fresh paper towel will remove excess glue and make sanding easier. Mark the poorest surface that you think should be the inside of the sheet with an "I".

4. Place the skin on a large, flat surface and sand it with a large, flat sanding block and fresh, sharp 220 paper. Use light pressure and a brisk circular motion.

5. Trim the perimeter of the sheet to even things out.



❑ 18. Make **four stab skins** from three 1/16" x 3" x 30" balsa sheets. See the sketch for the proper layout on the wood. Refer to the plans for the exact shapes and sizes, but remember to make the skins slightly oversize.

❑ 19. Pin the stab structure onto your building surface using pins at the tips and diagonally under the LE & TE. *Don't hide the pins under the skin.* Test fit the skins over the structure. Make sure the skins meet flush at the center. Adjust them if necessary.

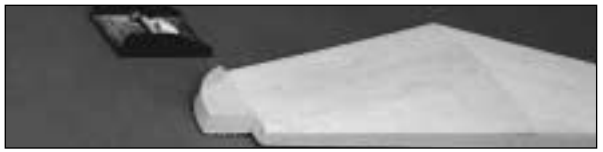
❑ 20. Apply an even bead of medium or thick CA to the upward facing edges of the structure. Place a skin in its proper position and press it firmly down until the glue has set. Repeat this step for the other top skin.

❑ 21. Remove the stab from the building board. Trim off the jig tabs with a sharp knife. Trim and blend the LE and TE to the ribs as you did before. Check all glue joints, adding glue as necessary.

❑ 22. Cut two 1/4" wide cross-grain strips from 1/16" x 3" balsa. (You probably have some left over balsa from the stab sheeting operation) Glue these strips between the two S-1 ribs flush with their **bottom edges** as you did in step #13.

❑ 23. It's **important** to get a good glue bond between the stab structure and the bottom stab skins. Apply a **heavy** bead of medium or thick CA to all of the *upward facing* edges of one side of the stab structure. Place a skin on the structure and hold it in place with your hands until the glue sets. Repeat this for the other bottom skin. **Be careful not to bend or twist the stab during this step.**

❑ 24. True up the ends of the stab with a sanding block. **IMPORTANT:** Round the LE of the stab to match the **cross section** on the plan.



❑ 25. Glue the 5/8" thick shaped balsa **Stab Tips** in position. Use a razor plane and a sanding block to shape them to an airfoil that matches the stab. You may contour the tips to their final shape now, or wait until the model is nearer completion.

BUILD THE FIN

❑ 1. Punch out the die-cut 3/32" balsa ribs **V-1** through **V-4**. Be sure to preserve their jig tabs.

❑ 2. Cut an 8" length of the tapered 1/4" balsa stabilizer LE stock and sand bevels on each end to **match the plans exactly** as the length of the LE sets the angle of the fin. Notice that the fin LE protrudes **through** the stab and fits into a notch on top of F-8.

❑ 3. Punch out the die-cut 1/4" balsa fin **TE** and lightly sand the edges to touch them up.

❑ 4. Pin ribs V-1 and V-4 to the building board over their proper locations. Center the LE on the front of the ribs and glue it in place. Center the Fin TE on the aft edge of the ribs and glue it in place.

❑ 5. Put ribs V-2 and V-3 into their places and glue them to the LE and TE. Remember, all jig tabs should contact the work surface.

❑ 6. Glue the die-cut 3/32" balsa **Fin Gusset** into the corner of V-4 and the Trailing Edge.

❑ 7. Apply extra CA+ glue to any joints that do not appear to be well glued.

❑ 8. Blend the LE to match the ribs on the upward facing (left) fin side. Sand the TE, if necessary, to blend smoothly with the ribs.

❑ 9. Make a skin for each side of the fin using the 1/16" balsa sheet left over from the stab skins. Make the skin so it **overhangs past V-1 about 5/8"**; this will allow fitting to the stab later. With the structure flat on the table, glue on the left skin.

❑ 10. Remove the fin from the building board and trim off the jig tabs. Blend the LE and TE to the ribs on the right side of the fin.

❑ 11. Use medium or thick CA to glue on the right skin. Be sure to get a good bond between the ribs and the skin.

❑ 12. True up the edges of the fin sheeting with a sanding block. Shape the LE to match the cross section on the plans.

❑ 13. Glue the shaped 3/4" balsa fin tip to the top of the fin. Use a razor plane and a sanding block to do the initial shaping of the tip. Final shaping should be done later, with the fin taped to the rudder.

BUILD THE ELEVATORS

NOTE: Build both elevators using the following steps

❑ ❑ 1. Place the die-cut 3/32" balsa **Elevator Bases (EB)** on the plans and mark **"Rib"** locations on both sides using the "tick" marks on the plans.

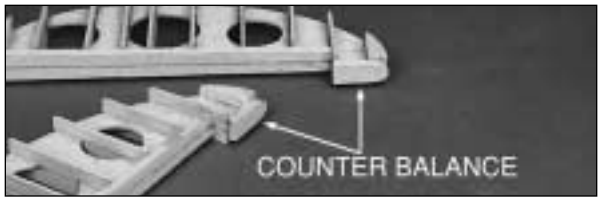
❑ ❑ 2. Draw a centerline on both sides of the die-cut 1/4" balsa **Elevator LE.** Draw two parallel lines 1/16" away from the centerline on the aft side.

❑ ❑ 3. Hold the Elevator Base centered between the lines on the Elevator LE. The narrow end of the LE is positioned at the elevator tip . Use CA to glue the Base to the LE.

❑ ❑ 4. Cut **"ribs"** from the 3/32" x 3/8" x 36" balsa sticks and glue them onto both sides of the elevators at the locations you previously marked.

❑ ❑ 5. Glue a 5/16" x 7/16" x 1-3/4" balsa **Elevator Root Block** to each side of both Elevator Bases.

❑ ❑ 6. Glue a 5/16" x 1/2" x 1-1/2" balsa **Elevator Tip Block** to each side of both Elevator Bases.



❑ ❑ 7. Center a die-cut 1/4" balsa **Counter-balance** on the LE of the elevator tip as shown on the plans, then glue it in place. Shape the front of the block to a radius. Allow approximately 1/16" clearance on the two matching edges between the counterbalance and the notch in the stab.

❑ 8. Refer to the photos and the cross sections on the plans to obtain the shape of the elevator tips, roots, and ribs. Use a razor plane and sanding block to "rough in" the shape of the blocks and ribs. Trial fit the elevators to the stab for final shaping.

❑ 9. Glue a die-cut 1/8" balsa elevator **Torque Rod Doubler** to both sides of the Elevator Bases as shown on plans and below.

❑ 10. Tape the elevators to the stabilizer. Hold the bent 1/8" **Elevator Joiner Wire and Horn** up to the elevator and mark the location of the holes (see the plans for the joiner location).

❑ 11. Remove the elevators from the stabilizer. Drill 1/8" holes in the elevators for the Joiner wire. Make slots inboard of the holes to allow the wire to be inset into the elevators. Sand the **Elevator LE** to a **"V"** shape to allow elevator travel. (See the cross-section on the stab) Test fit the joiner wire into the elevators. Check to see that the elevators align with each other properly. Make adjustments if required.

❑ 12. Mark the location of the **Elevator Control Horn** on the TE of the Stab. Remove a small amount of balsa as shown to allow clearance for the horn to move freely in both directions.

BUILD THE RUDDER

❑ 1. Glue the two die-cut 3/16" balsa **Rudder LE's** together with CA+. Even up the edges with a sanding block, but save any tapering for later.

❑ 2. Draw centerlines on both forward and aft surfaces of the LE. Draw two parallel lines 1/16" away from each side of the centerline on the aft side that will mate with the Rudder Base.

❑ 3. Glue the die-cut 3/32" balsa **FWD Rudder Base** to the die-cut 3/32" balsa **AFT Rudder Base.**

❑ 4. Align the Rudder Base over the plans and mark the "Rib" locations on both sides of the Rudder Base.

❑ 5. Hold the Rudder Base centered, at a 90 degree angle, to the rudder LE. Apply CA to the joint.

❑ 6. Center and glue the 1/4" x 3/4" x 1-3/8" balsa stick **Balance Tab LE** at the top of the Rudder Base.

❑ 7. Glue a 1/4" x 1/2" x 2-1/2" balsa stick **Rudder Tip** to both sides of the top of the Rudder Base as shown on the plans.

❑ 8. Glue two 5/8" shaped balsa **Rudder Bottoms** flush with the bottom edge of both sides of the Rudder Base.

❑ 9. Glue a 1/2" x 5/8" x 1-13/16" balsa **Rudder Horn and Tail Wheel Block** to both sides of the rudder at the location shown on the plans.

❑ 10. Cut **"ribs"** from the 3/32" x 5/8" x 36" balsa sticks and glue them to both sides of the rudder at the locations you previously marked.

❑ 12. Refer to the photos and the cross sections on the plans to obtain the shape of the rudder. Use a razor plane and sanding block to "rough in" the shape of the rudder. Final shaping, fitting, and beveling should be done after the fin is glued onto the fuselage, but you may wish to tape the rudder to the fin at this point to blend the upper ends of both.

BUILD THE WING

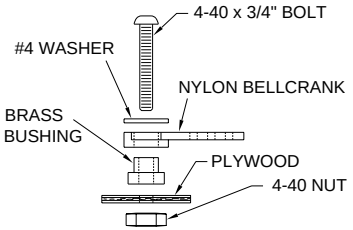
NOTE: The wing panels are built "UPSIDE-DOWN" on the plans. The jig tabs are attached to what is, in the end, the TOP surface of the wing. Since it is the standard convention to show the Top View of the wing, and the wing panels are built upside-down, the LEFT wing panel is built over the RIGHT Wing Top View and vice-versa. This does not present any problems; just be sure to build a left and a right wing.

PREPARATION

❑ 1. Locate the four 1/4" x 3/8" x 30" hard balsa **Wing Spars**, then cut them to 25-1/2" each. Save the cut-off ends for the flap servo mounts.

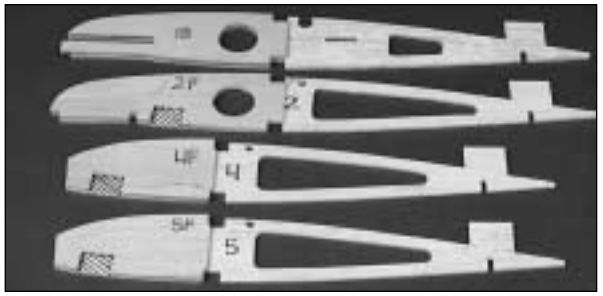
❑ 2. Punch out all the die-cut 3/32" balsa wing **Ribs** and 1/8" ply **Doublers**. Smooth out any imperfections with sandpaper. Be sure to keep the jig tabs attached to the ribs.

❑ 3. Ribs W-2 through W-9 have punch marks just aft of the spar. Drill a 3/16" hole at each of these marks for future installation of the aileron pushrods.

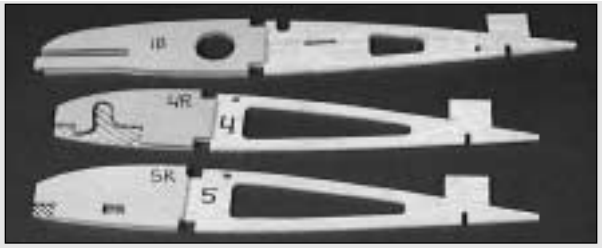


❑ 4. Drill 1/8" holes through the punch marks in the two die-cut 1/8" plywood **Aileron Bellcrank Plates (AB).** Assemble the bellcrank parts as shown in the sketch. Be sure to put a drop of **6-minute epoxy** on the **4-40 nut and threads** to prevent the bellcrank from vibrating loose.

NOTE: If you haven't already done so, now is the time to decide which type of landing gear configuration you will be using. Fixed or Retractable?

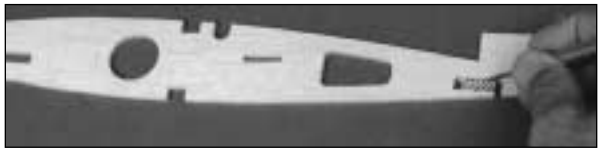


❑ 5. (Skip this step if installing retracts) If you chose to build your AT-6 with **fixed gear**, locate wing ribs **W-1, W-2, W-4, W-5**, and plywood doublers **1B, 2F, 4F, 5F**. Refer to the **left half** of the center section plans for the proper location of each doubler, then use CA+ to glue the ribs and doublers together. **Be sure to make a LEFT and a RIGHT of each rib assembly.** Remove the **shaded** area with a hobby knife or razor saw to allow for the gear rails.



❑ 6. (Skip this step if installing fixed gear) If you chose to build your AT-6 with **retractable gear,** locate wing ribs **W-1, W-4, W-5,** and plywood doublers **1B, 4R, 5R.** Refer to the right half of the center section plans for the proper location of each doubler, then use CA+ to glue the ribs and doublers together. **Be sure to make a left and a right of each rib assembly.** Remove the **shaded** area with a hobby knife or razor saw to allow for the gear rails.

NOTE: For retracts, rib W-2 does not require a doubler.

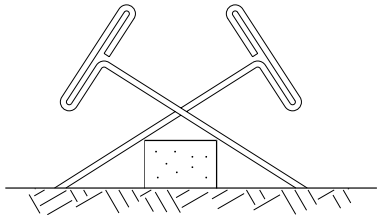


❑ 7. Finish cutting the slot in the aft portion of both W-1 ribs to allow for later insertion of the Wing Bolt Plate.

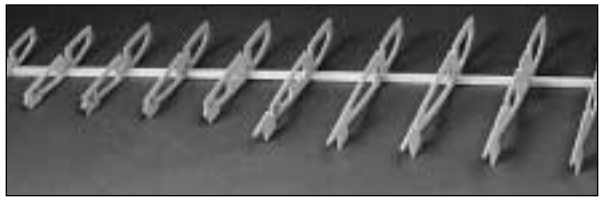
Okay, the prep work is behind you, so now that the dull stuff is done, let's build the outer wing panels so you'll have something to show when your friends drop in to check on your progress!

BUILD OUTER WING PANELS

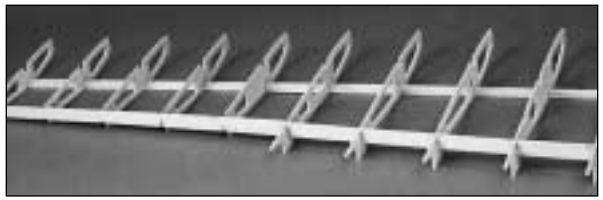
❑ 1. Place a **wing** panel plan on your building board and cover it with waxed paper. *Cutting the wing panel sections apart makes handling easier.*



❑ ❑ 2. Pin a **Spar** to the building board at three or four locations using the cross-pinning technique shown in the sketch.



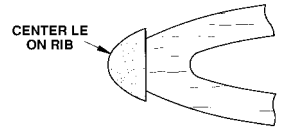
❑ ❑ 3. Position the die-cut 3/32" balsa ribs **W-6** through **W-15** on the spar. These should be vertical and aligned over their appropriate locations as indicated on the plans. *The **jig tabs** located near the aft end of the ribs should all **contact the work surface.*** Glue **W-7** through **W-15** to the spar. **Pin** W-6 in place for the time being.

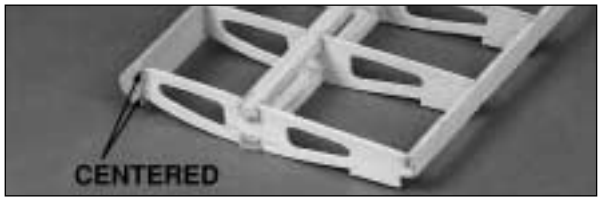


❑ ❑ 4. Test fit the die-cut 1/8" balsa **OUTER TE AT FLAP** and **TE AT AILERON** to the aft edges of ribs W-6 through W-10 and W-11 through W-15 respectively. The upward facing edges of the ribs and the top surface of the trailing edges should be even, and all of the jig tabs should touch the work surface. **NOTE:** Both Trailing Edges taper slightly from one end to the other. The **narrow** ends should be located at W-10 and W-15.

❑ ❑ 5. Sight down the TE of the wing from the root end; make sure all the ribs are aligned. Use paper to shim under the jig tabs of any ribs that are low. When everything looks level, glue the TE's in place. Once again, **don't glue the W-6 rib.**

❑ ❑ 6. Press the **Spar** into the wing notches and check for a flush fit at each rib. When satisfied, glue ribs W-7 through W-15 in place.

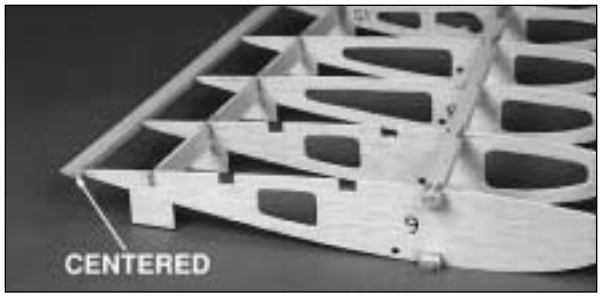




❑ ❑ 7. Cut a 4" length from each of the two shaped balsa **Leading Edges.** *These short pieces will be used when building the center wing panel.* Center one of the long LE's vertically on the front edge of the ribs. Glue it to ribs **W-7** through **W-15.**

NOTE: Do steps 8 and 9 for a wing *without operational flaps.* *Skip the next two steps if you are building a wing with operating flaps.*

❑ ❑ 8. Cut one of the **tapered** 1/2" x 24" balsa **Flap TE** in half, to make two 12" lengths. **Note:** This Flap TE is not used if you build operating flaps.



❏ ❏ 9. Glue the **Flap TE** to ribs W-7 through W-10. The Flap TE should be centered on the aft edges of the ribs and should be (as shown in the cross-section on the plans) aligned with the top and bottom of the ribs. Make sure all the jig tabs are contacting the table. A metal straightedge can be placed on the structure over the jig tabs to hold them down evenly.

Now you'll see why we didn't want you to glue W-6 in place earlier.

❏ ❏ 10. Draw a line through the two punch marks on the ply **Dihedral Gauge.** With the arrow on the gauge pointing up, position the gauge on the plan so the line you drew is on the **dashed reference line** printed on the plan. Move the gauge along the reference line and adjust the angle of W-6 until it's flush with the gauge from the **LE to the TE.** After double (*even triple*) checking that the angle is perfect, **glue W-6** in place at all points of contact.

❏ ❏ 11. Cut the two balsa 1/4" x 3/8" spar cut-offs to 3-1/8" long. Glue two of these sticks into the notches in ribs W-6 and W-7. These will act as supports for the flap servo hatch. If you don't plan on using flaps, fill the notches with scrap balsa (or install the rails even if you won't use them).

❏ ❏ 12. Glue the **Aileron Bellcrank** assembly into the slots in ribs W-10 and W-11. The bellcrank should face **away** from the building board as shown in the photo.

❏ ❏ 13. Locate the 3/8" x 1/2" x 15" balsa **Flap & Aileron Hinge Block.** Cut six 1" lengths to use as aileron hinge blocks (save the balance for use as flap hinge blocks). Glue 3 blocks where shown on the plans; save the other 3 for use on the second wing panel.

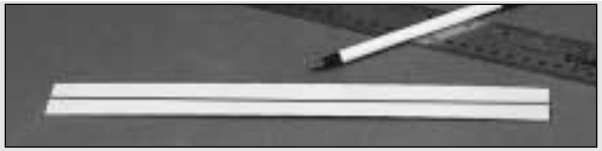
❏ ❏ 14. Trim the 1/16" x 2-3/4 x 1-11/16" balsa **Shear Webs** to fit behind the spar between ribs W-7 through W-15. **Do not install a shear web between W-6 and W-7.** Glue them in place with CA+. Wick CA between all the joints of the **shear webs** and the **spars** to make sure they are well **bonded.** It's not important to glue the shear webs to the ribs.

*If you are building your wing without operational flaps you can take a short break to admire your handiwork. When fully revived, clean the sawdust off your bench, swap the plan sheets, and **get busy building the other outer wing frame.** On the other hand, if you are installing operational flaps, you still have some more work to do, so get back to it. You can rest later.*

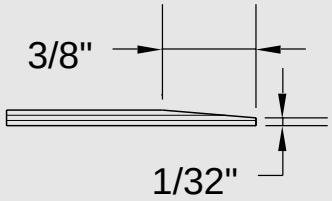
PREPARE THE WING PANELS FOR THE FLAPS

Do the following steps if you are building operational flaps.

❏ ❏ 1. Remove the wing panel from the building board. Use a T-bar with fresh 220 grit sandpaper to blend away any unevenness from the structure. Pay special attention to the trailing edge of the wing. It's important to make the trailing edge as straight as possible so the split flaps will fit well.



❑ ❑ 2. Draw a centerline down both sides of a 1/16" x 1" x 12" plywood **TE Strip**.

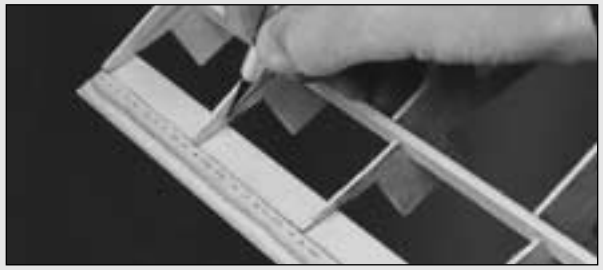


❑ ❑ 3. Use a T-bar with sharp 150 or 220 grit sandpaper to bevel the aft 3/8" of the TE Strip down roughly 1/32".

❑ ❑ 4. Locate the two 3/32" x5/8" x 12" balsa **TE Jig Strips.** Check the straightness of these Jig Strips by holding them on edge on a flat surface. True them up with a knife and a metal straightedge if required.

❑ ❑ 5. Place the ply TE Strip with beveled side down on a very flat table. Glue a TE Jig to the TE Strip on the centerline. The Jig will keep the TE straight until the wing is complete. **Do not** use excessive glue because it will have to be sanded off later.

❑ ❑ 6. Glue the TE Strip assembly to the wing structure with the **beveled side up.** The aft end of ribs W-6 through W-10 should align with the centerline you drew on the TE Strip. Do not force the ribs to touch the TE Strip. This will cause the TE to warp when you remove the Jig later; just fill any slight gaps with glue. **NOTE:** The TE Jig is designed to keep the ply TE Strip from warping. *It's not meant to touch the work surface so don't be alarmed when it doesn't.*



❑ ❑ 7. Use a razor saw and a hobby knife to trim off the **bottom** half of ribs W-6 through W-10. The **bottom** side is the side **opposite** the jig tabs.

❑ ❑ 8. Trim the ends of the TE Strip flush with the W-6 and W-10 ribs.

❑ ❑ 9. Use a T-bar sander to even up the ribs inside the flap bay.

❑ ❑ 10. Cut the remainder of the 3/8" x 1/2" x 15" stick (that you used to make the aileron hinge blocks) into ten 3/4" pieces. Fit and glue three of these pieces where shown on the wing plan. Save the remaining blocks for use on the other two wing panels. Mark the location of the hinge blocks on the outside of the TE spar to help you find them later.

Repeat the previous instructions to build the other outer wing panel.

Congratulations! Even though building operational flaps requires a little bit of patience and a lot of elbow grease, you will be rewarded by more scale appearance and slower landings than the less ambitious modeler. If that isn't enough, they just look great during slow fly-bys.

BUILD THE CENTER SECTION

❑ 1. Cover the Center Wing Panel plan with waxed paper, then pin a 1/4" x 3/8" x 18" balsa **Spar** in position over it.

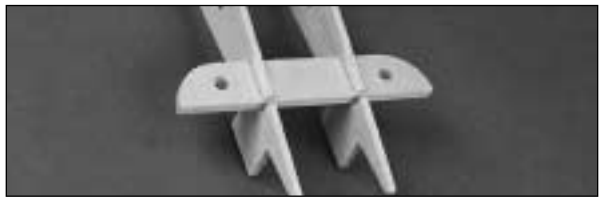
❑ 2. Locate both of the **W-1 Rib Assemblies** *(if the ply doublers are not glued in place yet, do it now)* and position them on the spar with the jig tabs pointing down. **Don't** glue the ribs in place yet.

❑ 3. Work the die-cut 1/8" ply **Aileron Servo Tray** into the slots in the W-1 ribs where shown on the plans. The **punch mark** on the tray must be positioned **toward** the leading edge. When installed correctly, there should only be a 1/16" gap between the edge of the Servo Tray and the Spar. This gap will allow a Shear Web to be inserted later. When satisfied with the alignment of the ribs and the Servo Tray, glue everything in place with CA.

❑ 4. Slightly round one end of both 1/4" **Wing Dowels**. Test fit the Wing Dowels into the slots in both W-1 ribs with the round end facing out. If needed, lightly sand the openings for a good fit. Slide the die-cut 1/8" ply **Dowel Jig** over the dowels to set the correct spacing between them. Use 6-minute epoxy to glue the Dowels into the slots. During this step don't worry about which end of the Dowel Jig is facing the work bench. You are only setting the horizontal spacing.

❑ 5. Glue the two die-cut 1/8" balsa **Center Brace (CB)** squares together along one edge. The grain must run across the narrow dimension.

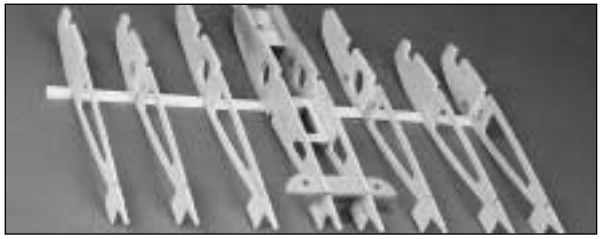
❑ 6. Check the fit of the Center Brace between the dowels. Sand the edges for a snug fit. Use 6 minute epoxy to glue it to the dowels with liberal fillets of epoxy around the joints. When the epoxy has cured, remove the dowel jig but save it for use during the wing sheeting process.



❑ 7. Glue the two die-cut 1/8" ply **Wing Bolt Plates** together with CA. Slide the joined Plate through the slots in the aft end of the W-1 ribs but **don't** apply glue yet.

IMPORTANT

THE STEPS PRINTED IN THE **SHADED BOXES** ARE FOR BUILDING YOUR AT-6 WITH **RETRACTABLE LANDING GEAR.** *SKIP THE SHADED INSTRUCTIONS IF YOU WILL BE INSTALLING FIXED GEAR.*



❑ 8. **(For FIXED GEAR only)** Pin Rib assemblies **W-2 , W-4**, and **W-5** on the Spar. Be sure the **2F, 4F,** and **5F Ply Doublers** are facing the correct direction. Make sure that the jig tabs are in contact with your work surface and that the tips of their trailing edges are aligned. Use a small triangle to hold the ribs vertical, then glue them to the Spar.

❑ 8. **(For RETRACT GEAR only)**. Pin Rib assemblies **W-2, W-4**, and **W-5** on the Spar. Be sure that the **4R and 5R Ply Doublers** are facing the correct direction. Make sure that the jig tabs are in contact with your work surface and that the tips of their trailing edges are aligned. Use a small triangle to hold the ribs vertical, then glue them in place.

❑ 9. Insert the die-cut 1/8" **slotted** balsa **TE** AT **FLAP CENTER** into the notches along the TE of the wing ribs. If necessary, adjust the depth of the notches to allow the slotted TE to fit flush with the upward-facing rib edges. Glue the TE in place when you are satisfied with the fit.

❑ 10. Adjust the Wing Bolt Plate so that it matches its position over the plans, and is parallel to the TE. Glue it to both of the W-1 ribs and the TE. Use thick CA or epoxy to create a fillet along all points of contact.

❑ 11. Glue the upper 1/4" x 3/8" x 18" balsa **Spar** in place.

❑ 12. Fit the die-cut 3/32" balsa **W-3 ribs** between the spars. Make sure that the Landing Gear Rail notch is pointing **away** from the work surface. Butt the ribs firmly against both Spars and glue them in place.

❑ 13. Use medium **CA** to glue the die-cut 1/8" ply **Leading Edge Braces** together (two pieces per assembly), then glue the assemblies into the notches in W-1 and W-2 and also to the side of W-3 as shown.

❑ 14. Center the shaped **Leading Edges** (Cut-offs from the outer wing panels) vertically on the front edges of ribs W-3, W-4, and W-5, then glue them in place.

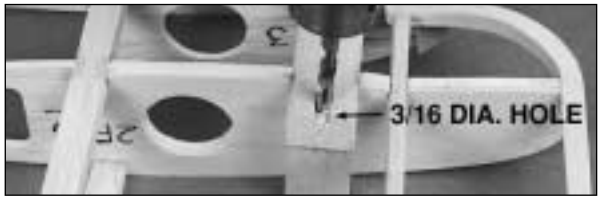
❑ 15. Cut one 3-5/8" **Forward Sub-Spar** from each of **two** pieces of 3/16" x 3/16" x 36" balsa fuselage stringer. Test fit the these short spars between Rib W-1 and the inside edge of the Leading Edge Brace. Glue them in place when satisfied with the fit. (See photo at step 16)

Skip the next four steps if you will be installing retract gear.

❑ 16. Test fit the two 1/2" x 3/4" x 5-3/4" grooved **Landing Gear Rails** into the notches in ribs W-2 through W-5. The fit should be snug, and the groove should be **facing away** from the work surface. Use 30-minute epoxy to glue the Rails in position. Be sure that the outer edge of the Rails are **flush** with the outside of the W-5 ribs.

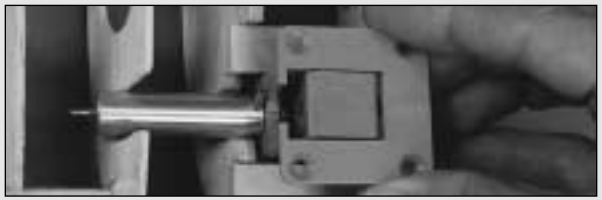
❑ 17. Carefully remove the wing center panel from the work surface. Use 30-minute epoxy to glue the two 1/2" x 3/4" x 1" **Maple Landing Gear Blocks** to the top of the Rails and the **sides** of the W-2 ribs doublers.

❑ 18. Draw a line 5/16" from the inside edge of the Grooved Rail.



❑ 19. Carefully **drill a 3/16"** diameter hole on this mark, **all the way through** the Maple Block with the drill bit angled slightly as shown in the photo. Protect your work surface with a piece of plywood underneath the drill bit.

❑ 20. **NOTE: perform this step regardless of landing gear configuration.** Glue the die-cut 1/8" balsa **Half-rib W-3B** to the top half of W-3 as shown on the plans. Make sure that it's flush with the contour of W-3.

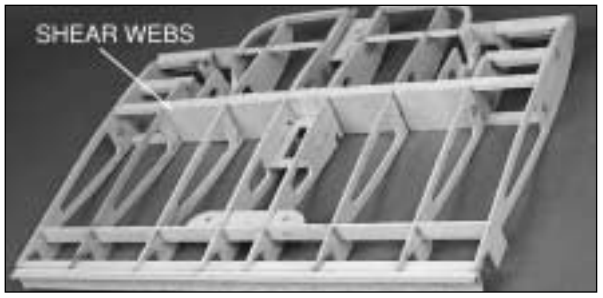


❑ 21. **(Retract Gear)** With the center panel pinned to the work surface, insert the two 1/4" x 1/2" x 2-1/2" ply **Landing Gear Rails** into the notches in ribs W-4 and W-5. Test fit the retract mechanism (without the struts in place) and make any adjustments required for a good fit. **Don't** cut out the wheel wells in W-2 just yet; we'll get to that after sheeting the bottom of the wing. When everything fits well, use **30-minute epoxy** to glue the Rails in position. Be sure that the outer edges of the Rails are **flush** with the outside surface of the W-5 ribs.

❑ 22. Use scrap balsa to build a supporting base for the sheeting, as shown in the photo.

❑ 23. **Do this step if you are NOT installing operational Flaps.**
True-up the aft edge of the ribs with a straightedge and T-bar sander. Cut the 1/2" x 24" tapered balsa **Trailing Edge** to 17", then glue it to the ribs. The TE should be centered on the aft edges of the ribs and should be aligned as in the cross-section with the top and bottom of the ribs. Make sure all the jig tabs are contacting the table. A metal straightedge can be placed on the structure over the jig tabs to hold them down evenly during this step.

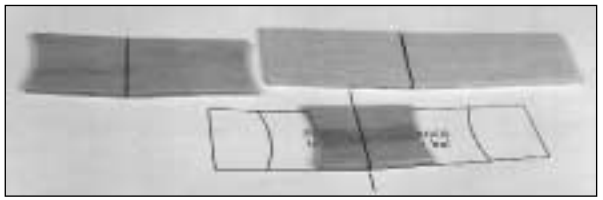
For operational flaps, perform steps 1 - 10 on page 15-16, applying the same techniques to the center panel. Substitute 18" pieces where 12" lengths are specified. Note: The next photo shows the ply TE installed, but the ribs have not yet been trimmed out.



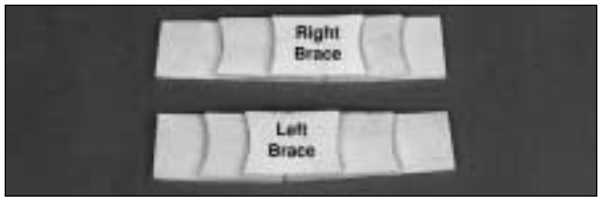
❑ 24. Glue 1/16" balsa Shear Webs to the **front and rear** of the center panel main Spars between all ribs **except** W-4 and W-5.

❑ 25. Trim the Spars, LE, and TE flush with the outside edges of the W-5 ribs. Lightly sand the top, bottom, and ends of the center panel to blend the ribs with the Spars and to remove any excess glue.

PREPARE THE POLYHEDRAL BRACES



❑ ❑ 1. Position the 1/8" ply **Polyhedral Braces** over the sketch on the plans. Look carefully at each piece and you will notice that one end is slightly tapered. **This is the end that plugs into the outboard panel**. After you align each piece over the drawing, mark an index line on each part as shown, then extend it around to both edges.



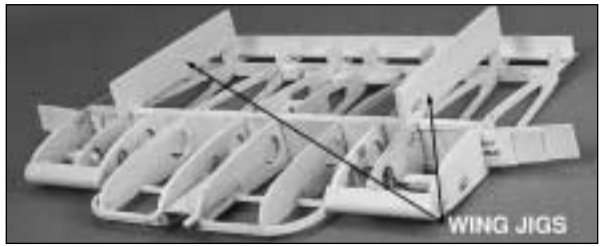
❏ ❏ 2. **Without gluing**, stack the three Braces together and compare the assembly with the drawing. Repeat this process with the second set of braces, *but this time flip the pieces over* when you stack them. You should now have a **right** hand and a **left** hand set of braces, as shown in the photo. *Tracing around the edges of the two shorter parts will help alignment when you glue them together.*

❏ ❏ 3. When satisfied that the braces are accurate, use 6 minute epoxy to glue the parts together.

JOIN THE WING

❏ ❏ 1. Carefully remove a 3/8" wide strip of balsa between the spars on both W-5 and W-6 ribs. This will allow the Polyhedral Braces to be inserted and glued between the spars.

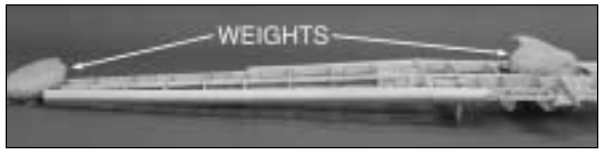
❏ ❏ 2. Test fit the Polyhedral braces into the center and outboard wing panels, sanding if necessary for a good fit. The wing panels should mate evenly along the joint without any unnecessary twisting or bending to line things up. If you have to force the panels to fit, locate the problem and fix it before proceeding. Any twists will become a permanent part of the structure after the panels are joined and will be difficult to correct.



❏ ❏ 3. Use only a spot of CA to glue the two 1/4" x 1-7/16 " x 7-1/2 " balsa **Wing Jig Blocks** to the W-4 ribs. Glue the blocks to the **W-4 jig tabs** and the **top** of the spar.

Now for the hard part, cleaning a space on your work bench large enough to spread out and join the wing.

IMPORTANT: Check your work surface with a metal straightedge to make sure that it's perfectly flat before proceeding. Make a "dry run" of the following step before actually performing it with glue.



❏ ❏ 4. Place the Center panel on the Jig Blocks in the middle of your work bench. Add some weight to hold it in place (phone books or small sandbags are handy for this). Prepare 1/2 ounce of **30 minute epoxy**. Liberally apply the epoxy to the W-6 Ribs and Polyhedral Braces. Plug the Braces into the **Outboard** panels. Plug the Outboard Wing Panels **into** the Center section and **align the Ribs** for a flush fit. *Don't worry about the exact alignment of the leading edge. If you didn't glue the Leading Edges exactly centered on the ribs they won't match. After the wing is sheeted, the LE joints will be blended with sandpaper.* Once all the panels are in position, clamp the ribs together and align the Polyhedral Braces between the Spars as shown on the top view of the plans. Put weights on the two W-15 ribs to hold the jig tabs and Spars on the work surface. **Before the epoxy kicks off, double check your work. Fill any gaps between spars with 30 minute epoxy**

SHEET THE BOTTOM OF THE WING

Our suggested wing sheeting process allows you to sheet the wing panels with one skin per side. This technique is better than sheeting the wing with individual sheets, and allows you to pre-sand all of the seams that will be over open structure.

All balsa sheeting will usually bend when it's cut from the log since stresses are relieved. For the best results, trim the edges of the wing sheeting with a long metal straightedge and a **sharp** knife before joining them.

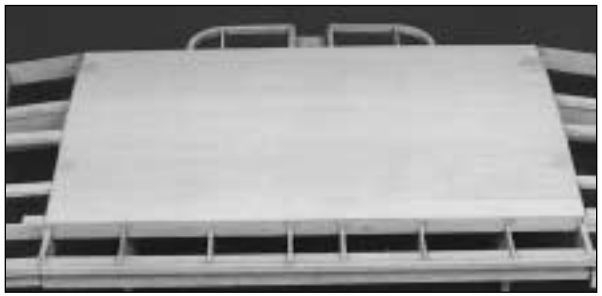
NOTE: Do the following steps for **both** the right and left wing panels.

❏ 1. Sort through the remaining 1/16" x 3" x 30" balsa and pick out the 6 best sheets to be used for the top surfaces of the outboard wing panels. Pick out the 4 best 1/16" x 3" x 18" sheets to use on the top of the center section.

❏ 2. Lay waxed paper over a flat, **smooth** work surface.

❏ 3. Make **four outboard wing skins** by edge gluing **three** 1/16" x 3" x 30" balsa wing sheets together to make (4) 9" x 30" skins. Make **two center section** skins using four sheets of 1/16" x 3" x 18" balsa to make two 12" x 18" skins. Refer to page 9 for tips on making skins.

NOTE: The steps below show the sheeting of a wing **with functioning flaps.** Wings without functioning flaps are sheeted the same way, but they will look slightly different.

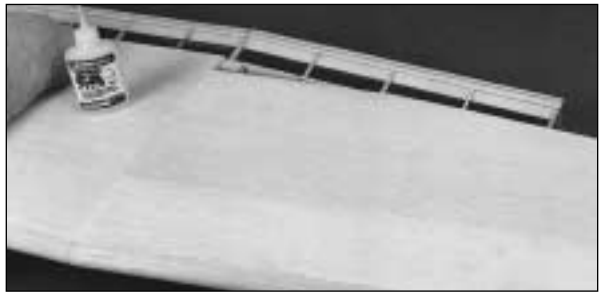


❏ 4. Tape a center section skin to the bottom surface of the wing with one edge butted up to the LE. Mark the aft edge of the sheet (along the flap line or *along the inside of the tapered TE if no flaps are used*) from the opposite side with a pen. **Cut** the skin close to the correct size then **sand** it for an exact fit. The side edges of the skin should be **centered** on the joint between ribs W-5 and W-6.

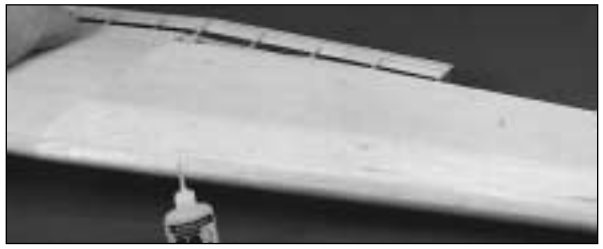
❏ 5. Glue the center skin in position using Medium or Thick CA. Hold the skin in contact with structure until the glue is dry. Glue a separate piece of 1/16" x 3" x 9-1/2" balsa (cut from a 30" sheet) to the forward, wheel well portion of the center panel.

❏ ❏ 6. Fit one of the 9" x 30" skins in place on an outboard wing panel, with one long edge butted tightly against the LE. The inboard edge should overlap the center section. Tape the skin in place. With a flexible ruler, mark the edge that mates with the center panel. Flip the wing over and mark the tip and TE from the back side. *Allow an extra 1/4" around these two edges.* Remove the skin and cut it to the marked size. If necessary, use 220 grit sandpaper to *fine tune* the inboard edge for an **exact** fit.
Hint: The best balsa filler, is **no** balsa filler! *Take you time fitting all sheeting and skins in place. With a little bit of careful sanding you will be rewarded with perfectly matched joints and a lighter, stronger airframe.*

NOTE: Make a "dry run" of steps 7 and 8 before actually performing them with glue.



❏ ❏ 7. Position the skin up against the **LE,** then glue it to the LE with Thin CA. Blot any excess CA with a paper towel or tissue.



❏ ❏ 8. Gently lift the skin and, working quickly, apply a bead of **Thick CA** (also known as CA-) to the structure that the skin will touch. Hold the skin in position and press it into place.

Important: Before the CA sets, **weight** down the center panel and the TE of W-15 to set the washout angle

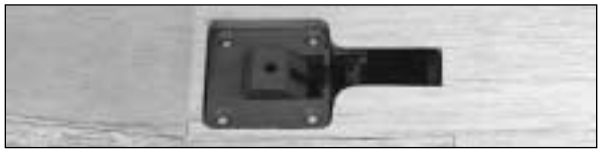
❏ ❏ 9. Sheet any remaining openings in the bottom wing skin such as around the TE and non-operational flaps.

❏ ❏ 10. Repeat steps 7, 8, and 9 for the other outer wing panel.

❏ ❏ 11. Turn the wing over and place it on foam rubber or a soft surface to avoid premature *hangar rash.* Use the plans to help you locate the aileron pushrod exits. Cut a 3/16" x 3/4" exit hole in each outboard panel. Reinforce the skin around the openings (from the inside) with small strips of 1/16" scrap balsa.

❏ ❏ 12. Use a sharpened piece of wire to bore small holes through the skin from the **inside** to mark the location of the flap servo hatches and retract rails. If you will be using fixed gear, mark the location of the landing gear wire by twisting a 3/16" drill bit through the top of the torque block and out through the sheeting. Starting from the hole you just made, cut away a 3/16" wide strip of sheeting above the groove in the landing gear block.

❑ ❑ 13. Rough cut the hatch openings on the inside of your guide holes, then use a 1/16" ply **Hatch Cover** to mark and cut the full size opening. *Remember, it's faster to enlarge a hole that's too small than to shrink one that's oversize.*



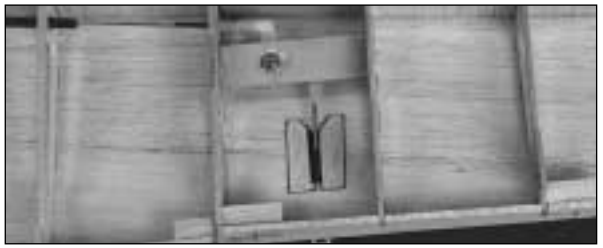
❑ ❑ 14. If you will be installing retracts, remove enough material to install the mechanism and air cylinder, but leave final fitting of the gear struts and wheels until later.

❑ ❑ 15. Screw a **Nylon Clevis** onto a **4" Wire Pushrod**. The threaded portion of the wire should be flush with the **inside** edge of the clevis. Make a 90 degree bend **3-1/8"** from the **clevis pin**. Cut off the excess wire, 1/4" past the bend. Make a second pushrod in the same manner.

❑ ❑ 16. Insert the aileron pushrod through the access hole in the skin and poke it through the bellcrank from the top. **Hint:** *Use a 5/64" drill bit to enlarge the hole where the aileron pushrod will connect with the bellcrank.* Attach a Nylon **Faslink** to secure it in place. Repeat this step for the other wing panel. If necessary, hollow out a small indentation on the underside of the ply to prevent the Faslink from catching.

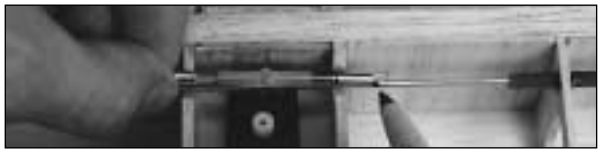
❑ ❑ 17. Cut the two 24" **Plastic Outer Pushrod Tubes** to a length of 15-1/2". After roughening the outer surface of the tubes with sandpaper, push them through the 3/16" holes that you drilled earlier during construction. Refer to the plans for exact location, but generally they run from W-2 to W-9. When positioned, spot glue them to each rib with Medium CA.

❑ ❑ 18. Screw a Nylon Clevis onto the threaded ends of two 36" wire pushrods. As before, the threads need to be into the clevis about 1/4", or flush with the inside opening. Cut the pushrods down to 22-1/2". Cut ten 3/16" lengths of inner plastic pushrod tube, then slide them onto the wire as shown on the plans. If they are too loose, apply a drop of CA to secure them in place. If too tight, cut them a little shorter. Carefully insert the pushrod wires into the tubes from the W-11 ribs towards the center. Hook-up the clevises to the bellcranks and check for free movement.



❑ ❑ 19. Position the aileron (outer) pushrod clevis pin approximately 1/16" behind the TE and tape it in position against the underside of the wing. The bellcranks should be neutral. Repeat this step for the other wing panel.

❑ 20. Screw **Threaded Brass Couplers** all the way into both ends of a Nylon **Dual Aileron Coupler**.



❑ 21. Hold the pushrods together at the center of the wing and draw a line across both pushrods at the center of the servo opening. **Hint:** *It helps to drop a servo into position to help with this alignment procedure*. Hold the Aileron Coupler on the pushrods with the Ball

Socket aligned with the center marks. Draw a line on the pushrods at the end of each Brass Coupler. Cut off the ends of the pushrod wires 1/4" towards the center from the marks. File off any burrs and test fit the assembly.

TIPS FOR SILVER SOLDERING

Use this process when soldering metal to metal such as brass tube to wire, or pushrod ends to wire.

A. Thoroughly clean the items to be soldered with alcohol or degreasing solvent. Pay special attention to the **inside** of the Threaded Brass Couplers.

B. Roughen the area to be soldered with fine sandpaper, then clean again.

C. Assemble the items to be soldered.

D. Apply a small amount of soldering flux. Acid based flux works best when one or more of the items is steel.

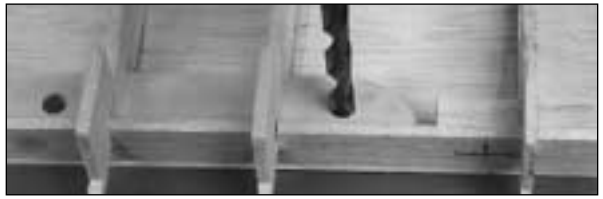
E. Heat the metal with a soldering gun or iron, and apply solder to the metal. The metal must get hot enough to melt the solder and the solder must flow freely into joint.

F. Do not move the parts until the solder has cooled.

G. Test the joint by pulling hard.

H. Clean off the excess flux with alcohol or solvent. Coat the parts with a very fine film of oil.

❏ 22. Unscrew the Threaded Brass Couplers from the Dual Aileron Coupler to prevent the Nylon from melting, then **silver solder** them to the pushrod wires. Unsnap the Clevises from the Bellcranks and screw the Dual Aileron Coupler back **on** the Threaded Brass Couplers. Reconnect the Bellcranks to the pushrods and make final adjustments to **center the ball socket** and **align the Aileron Pushrods at the TE**.



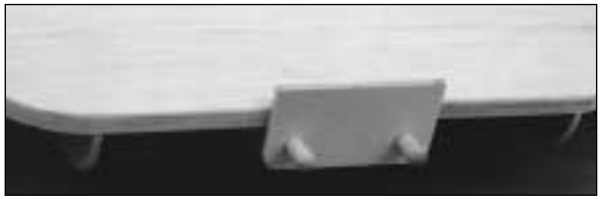
❏ 23. Use a sharpened piece of wire to bore through the exposed side of the Wing Bolt plate to mark the holes in the **bottom** wing skin for the wing bolts. Mark these holes **now** as it will be difficult to find the location after the top wing skin is applied. Open up the holes on the bottom side with a Dremel drum sander.

❏ 24. If you are planning on using operational flaps, you can simplify the job of "fishing" the servo wires through the enclosed wing with a little preparation. Tie one end of a 24" length of string to a 5" long scrap balsa stick. Thread the string through the wing rib holes between both servo hatch openings and tie another stick to the other end. Secure the excess string in the aileron servo compartment. When the time comes to thread the servo wires, just tie them to the string and pull them through to the center compartment.

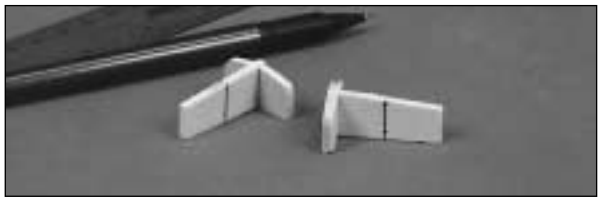
SHEET THE TOP OF THE WING

NOTE: This kit includes a special set of wing jigs to hold the wing at the proper washout angle (2 degrees washout at each tip) while you apply the top skins. Twisted wings are a major cause of bad flight characteristics. Polyhedral angles can vary slightly, so if your tip jigs require adjustment, just be sure that both tip jigs are modified the same, and are therefore **identical.** Be careful not to change the washout angle (the negative angle of attack of the tip ribs) if you adjust the jigs.

❏ 1. Carefully remove the two 1/4" balsa wing jigs from the wing. Trim off the jig tabs from W-1 through W-15. Blend away any inconsistencies in the top wing surface with a T-bar and 220 grit sandpaper. Check around each rib at the LE for glue blobs and remove them with a hobby knife or sandpaper.

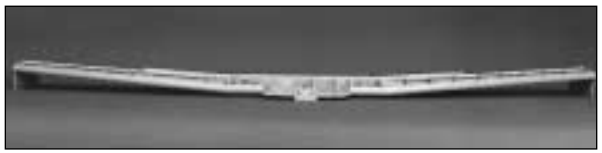


❏ 2. Slide the die-cut 1/8" plywood **LE Jig** over the dowels, with the flat edge towards the sheeted bottom side of the wing.



❏ 3. Glue the die-cut 1/8" plywood **TE Jigs** together. Draw a reference line through the two punch marks as shown in the photo.

❑ ❑ 4. **Use the reference line** you drew to align the TE Jig with the TE at Flap Center. Tack glue the TE Jigs to the bottom skin under the W-4 Ribs. If you are not using flaps, and the TE has been sheeted, you can find the location of W-4 by using a pin or a sharpened wire to poke a **small** hole through the skin from the top at the correct spot.



❑ ❑ 5. Place a die-cut 1/8" plywood **Tip Jig** under each W-15 rib. You should tape or tack glue the Jig to the wing.

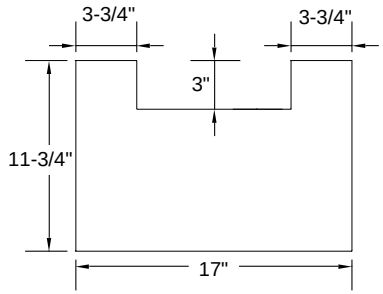
❑ ❑ 6. Check the fit of an outboard skin to the wing structure. Make adjustments if required to fit flush with the LE. Sand a slight bevel to the edge of the skin that will contact the LE to allow for a better gluing surface. Once a good fit is obtained, mark and cut the inboard edge of the skin so that it will fall on the joint between W-5 and W-6.

❑ ❑ 7. Hold the skin in place, butted firmly against the LE, then wick Thin CA into the joint. Wipe off any excess glue before it dries.

❑ ❑ 8. Gently lift the skin and apply a bead of Thick CA (CA-) to each rib. Apply glue to the Main Spar and the TE at the Flaps and Aileron last. Roll the skin into position and smooth it into contact with the underlying structure. Add weights to the entire top of the wing while the glue dries. A small stack of magazines are ideal for this purpose as they will match the contour of the wing.

9. Repeat steps 6,7, and 8 for the other panel.

❑ 10. Measure and cut a 1/16" balsa sheet to fit the openings at the aft end of the wing skins. When satisfied with the fit, glue them in place.



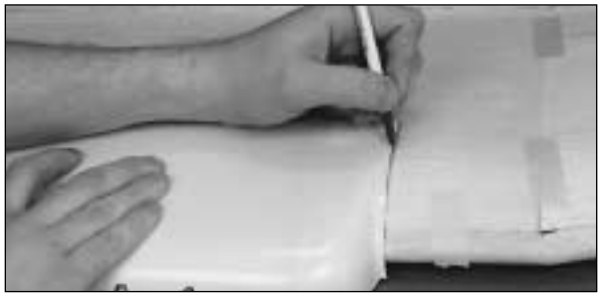
❑ 11. Cut the top center panel skin to the dimensions shown in the sketch. When cut, the skin will be **slightly larger** than the opening to allow for the edges to be trimmed to the exact size.

❑ 12. Lightly rub some chalk along the top **edge** of the outboard panel skin. Tape the aft edge of the center skin in position along the ply (or tapered balsa) TE. By pressing the center skin down over the chalked edges, and rubbing your finger over the seam, you will transfer an exact outline in chalk to the center skin. Trim away the excess balsa with a hobby knife, then sand with 220 grit for a precise fit. Fit the LE of the sheet by trimming a **little** at a time. **Do not glue it in place yet. Tape** the center skin in position for the time being.

❑ 13. Remove the excess plastic from around the perimeter of the Wing Center Fairing. (See photo at step 16) Score the plastic with a hobby knife then flex the plastic until it breaks off. Trim the Fairing to the embossed outline that can be found on the inside of the part. Try to make nice **straight** edges as you will cut the balsa skin to match the Fairing.

❑ 14. Drill two 5/16" holes in the Fairing to allow the wing dowels to poke through. The Center Fairing has been marked with the proper location for the holes, but building variations may require that you enlarge the holes for a good fit.

❑ 15. Remove balsa from the LE to a depth of about 1/16" at the point where the Center Fairing fits against it.



❑ 16. Hold the Center Fairing in position, then trace around the perimeter with a pen. Cut away the excess balsa, then check the Center Fairing for fit.

❑ 17. Glue the center panel **balsa skin** to the ribs and spar with Thick or Medium CA.

❑ 18. Using the plans as a guide, cut the opening in the top of the wing sheeting for the aileron servo. **Hint**: *Make a small opening to start with, then work outward until the correct size is reached.*

❑ 19. If you will be installing retracts, drill a 1/2" hole through the top of the Center Fairing roughly 3/4" forward of the spar, centered between the W-1 ribs. This hole will allow passage of the retract air tubes.

❑ 20. Roughen the inside of the plastic Center Fairing with coarse sandpaper, then glue it in position with Medium CA.

At this point you should have the main wing structure fully sheeted. You may now remove all Jig parts from the wing and sand off any glue marks.

WING COMPLETION

❑ 1. Mark and cut 1/4" clearance holes for the wing bolts from the bottom, through the top wing skin. **Hint:** *A 1/4" drill bit will do the job but it may tear up the sheeting as it exits. A round file or Moto-Tool with a small cutting tip will do a neater job.*

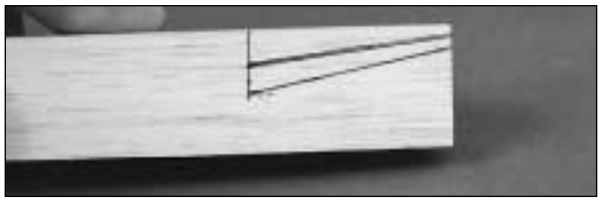
❑ ❑ 2. Trim the sheeting where it protrudes past the edge of the structure.

❑ ❑ 3. Razor plane and sand the wing Leading Edge until it blends well with the sheeting to form a smooth airfoil. Final sanding of the LE near the tip should be done after the tip block has been installed.

❑ ❑ 4. Square off the tip of the wing with a T-bar.

Before attaching the Wing Tip Blocks you need to insert die-cut 1/16" ply Reinforcement pieces into the TE of each tip. Do this as follows:

❑ ❑ 5. Tack glue the shaped 1" balsa **Wing Tip** to the tip of the wing as shown on the plans. The bottom of the Wing Tip must be flush with the bottom of the wing, aft of the spar. Place a ruler on the top of the wing and extend it back to the TE of the Wing Tip. Draw a line to match the airfoil as shown in the photo. Repeat for the other Wing Tip.



❑ ❑ 6. Remove the Wing Tips. Draw a line from the **center point of the airfoil height** to the center of the TE.

❑ ❑ 7. Transfer these lines to the **outside edge** of the Wing Tip. A piece of masking tape can act as a straightedge to help draw the line around the curve.

❑ ❑ 8. Cut a 1/16" slot through the line you just drew. *If a band or scroll saw isn't available use a razor saw or hacksaw blade*. Glue the 1/16" die-cut ply **Wing Tip Reinforcements** in place.

❑ ❑ 9. Glue the Wing Tip Blocks to both W-15 ribs. Shape the Wing Tip with a razor plane and a sanding block. **Don't do the final shaping** of the aft portion of the tips until the ailerons are built and taped in position.

Time to celebrate! Your wing is almost done and it looks great, doesn't it? Invite your buddies back to the shop for a progress update. Also, your floor needs sweeping.

NOTE: If you are not building operational flaps, skip the following section and proceed to build the ailerons.

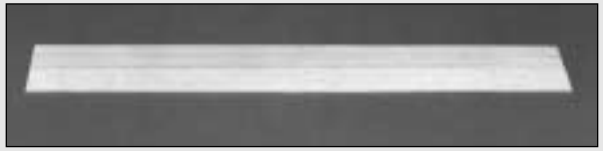
BUILD THE FLAPS

NOTE: The following instructions show the **center flap** being constructed. The two outboard flaps are built using the same procedure, only the length is different.

❑ 1. Place the Flap section of the plans on a flat work surface and cover it with waxed paper.

❑ 2. From a sheet of 1/16" x 3" x 30" balsa, cut **two** strips **exactly** 1-1/16" wide x 30" long.

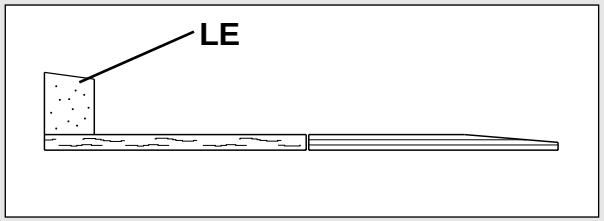
❑ 3. Place one of the 1-1/16" balsa strips on the **Center Flap plan**, aligned along the **LE**. Cut the length to match the plan. Pin it in place.



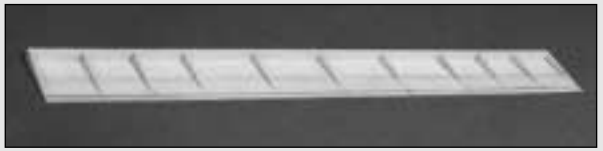
❑ 4. Cut the **Aft Flap Section** from a 1/16" x 1" x 18" **ply** strip to match the plans. Draw a line lengthwise on one surface of the ply, 3/8" from the TE. Butt the ply against the forward balsa strip and if necessary, lightly sand the edges for a good fit but **don't glue** it in place yet.

❑ 5. Using a T-bar and **sharp** sandpaper, taper the ply strip from the centerline to the TE. The finished edge should be **approximately 1/32"** thick.

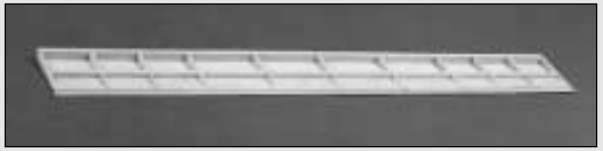
❑ 6. Glue the ply Aft Section to the Forward balsa strip. The beveled edge of the ply must be towards the TE, **facing up**. Use the tic marks on the plans to mark the **Rib and Spar** locations. The Ribs **do not** go all the way to the TE of the ply.



❑ 7. Cut the **Center Flap LE** from a 3/16" x 1/4" x 24" balsa stick to match the plans. Glue the LE to the top of the sheeting.

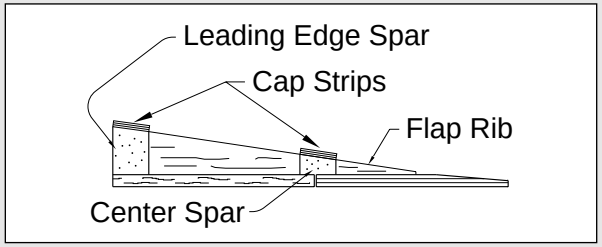


❑ 8. Locate the 3/32" x 1/4" x 1-1/2" flap ribs. Glue the Ribs to the sheeting at the locations you marked earlier. **Note:** The ribs may be angle cut before gluing, or sanded to shape after assembly.



❑ 9. Cut and glue pieces to form the **Flap Center Spar** from 1/8" x 3/16" x 24" balsa to fit between each Rib.

❑ 10. Use a T-bar with 220 grit to sand the Ribs and Spar to an even taper from the LE to the TE. Be careful not to sand off too much material.



❏ 11. Fit and glue a 1/32" x 3/16" x 18" ply **Cap Strip** to the length of the Center Spar and also to the top of the Leading Edge Spar. Hold a straightedge over the Cap Strips while the glue cures. The Cap Strips will help prevent the flap from warping.

❏ 12. Locate the four 3/32" x 1-1/4" **Brass Flap Joiner Tubes**. *Two of these will be used on the center Flap, and one on each of the outboard Flaps.*

❏ 13. Notch the two end ribs just behind the center spar to accept the diameter of the Brass Flap Joiner Tubes. Make sure that the tubes rest evenly on the sheeting. Roughen the tubes with 220 grit sandpaper, then glue them to the sheeting, flush with the outside edge, with Medium CA.

❏ 14. Cut ten 3/16" x 3/4" x 3/4" **Hinge Blocks** from the 3/16" x 3/4" x 8-7/8" balsa stick. Four of these Blocks will be used for the Center Flap. The remaining six are for use on the two Outboard Flaps. Refer to the plans for the location of the Hinge Blocks, then glue them between the Ribs, to the sheeting and spars. It's necessary to cut a bevel on one edge of the two outboard Blocks to fit over the Flap Joiner Tubes.

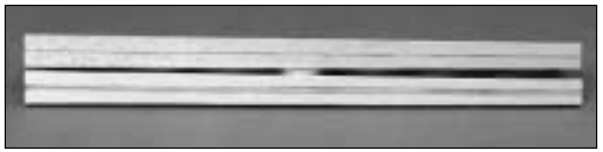
❏ 15. Sand the protruding edge of the blocks to match the contour of the Ribs.

❏ 16. Use the same procedure to build the two outboard Flaps, but don't install the Joiner Tubes until you read the following important note.

Important: *Before you glue the Brass* ***Flap Joiner Tubes*** *to the outboard Flaps, check the fit and alignment of the Flaps against the plans. Insert the 1/16" Joiner Wires into the tubes to check alignment between the edges of the Flaps. Make any adjustments to the tube location before gluing in position.*

❏ 17. Glue the die-cut ply 1/8" x 5/8" x 5/8" **Horn Doublers** to the two outboard flaps at the locations shown on the plans. Due to the offset servos, the Horn Doublers are **not** in the same location on the two outboard Flaps.

BUILD THE AILERONS

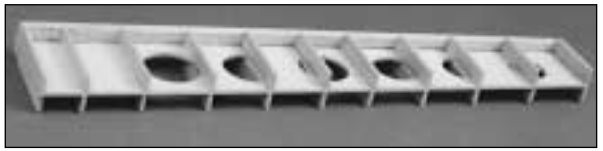


❏ ❏ 1. Draw a centerline on the die-cut 1/4" balsa **Aileron LE** and also offset lines 1/16" on either side of the centerline. Draw a centerline on the other side of the Aileron LE; this will help you "V" the leading edge later.

❏ ❏ 2. Place the die-cut 3/32" balsa **Aileron Base** on the plans and mark the "Rib Locations" on **both** sides of the part.

❏ ❏ 3. Place the Aileron Base between the parallel lines you drew on either side of the LE center line. The narrow end of the LE points toward the narrow end of the Aileron Base. When the parts are aligned, use CA to glue the parts at right angles to each other.

NOTE: The Aileron LE is die-cut longer than the Aileron Base to allow final trimming on both ends.

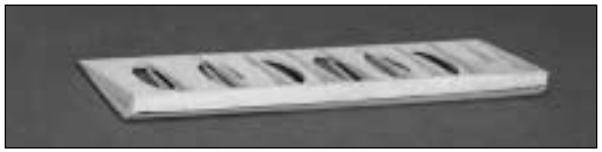


❏ ❏ 4. Cut **"Ribs"** from 3/32" x 3/8" x 36" balsa sticks. Glue the Ribs to both sides of the Aileron base between the marks.

❏ ❏ 5. Refer to the plans for Aileron shape. Use a razor plane and a sanding block to shape the Aileron. Test fit the Aileron to the wing for final shaping.

❏ ❏ 6. Refer to the plans for the location of the **Aileron Control Horn Block** on the **bottom** of the Aileron. Glue the 3/8" x 5/8" x 1-1/8" hard balsa Aileron Control Horn Block in place.

❏ ❏ 7. Shape the Aileron Control Horn Block to match the Aileron contour.



❏ ❏ 8. Shape the **Aileron LE** to a "V" shape to allow proper Aileron travel. Refer to the plans for the correct "V" angle.

BUILD THE FUSELAGE

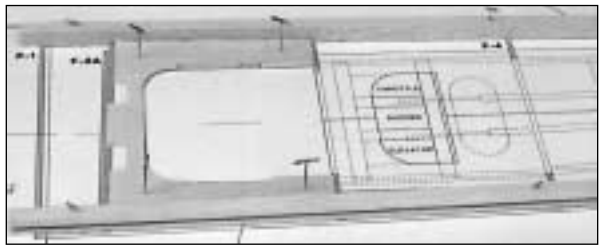
TOP FRAME ASSEMBLY

NOTE: The 1/8" die-cut plywood formers are stamped only with the necessary portion of their name. For example, F-2B is stamped 2B.

IMPORTANT: All formers must be installed with the stamped identification number facing *forward.* Drill 3/16" holes through each of the punch marks on formers 4 – 8 before proceeding.

❏ 1. Pin the **top view** of the Fuselage plan to a flat building surface, then cover it with waxed paper.

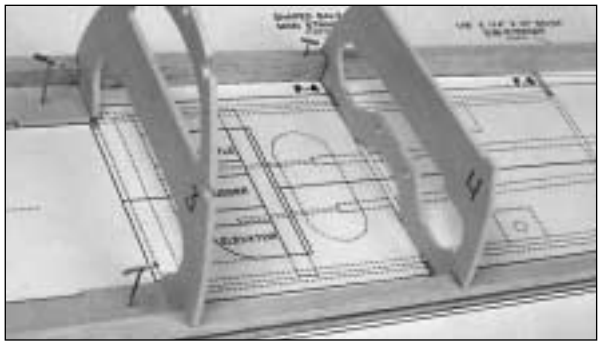
❏ 2. Align and pin the die-cut 1/8" ply **Forward Crutch** to the plans. *The angle of the forward edge is designed to provide the correct amount of right thrust for the engine.*



❏ 3. Pin the 3/8" x 1/2" x 40" **Shaped Main Stringers** to the plans on each side of the crutch. Glue them to the crutch with thin CA. The Shaped Main Stringers must be positioned with the 1/8" groove **closest** to the plans, facing outward. Leave excess material extending beyond F-1 and also at the tail for trimming to size later. **HINT:** *You might find it easier to only pin the forward end of the Stringers next to the Crutch, then bend and pin the Stringers to match each former as you proceed towards the tail.*

❏ 4. Glue **F-2B** to the forward edge of the plywood crutch.

NOTE: Use a small triangle to hold ALL formers vertical while gluing. Any small warps or twists will be taken out when the 3/16" stringers are glued in later.

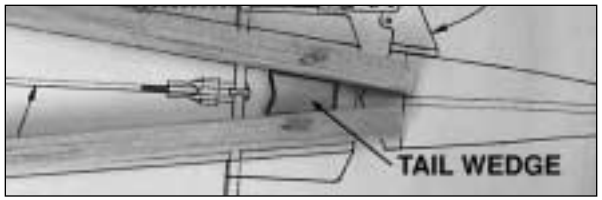


❏ 5. Glue **F-3** and **F-4** to the Main Stringers. F-3 is also glued to the aft edge of the crutch.

❏ 6. Cut two 1/8" x 3/8" x 3-3/4" **Servo Rail Doublers** from left-over die sheet ply. Glue the rails to the servo tray as shown in the photo.

❏ 7. Glue the **Servo Tray**, with the doublers facing up, between F-3 and F-4. The Servo tray is notched to fit into the underside of the formers.

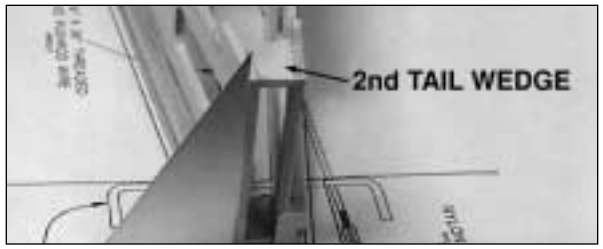
❏ 8. Glue **F-5 through F-8** into place along the Main Stringer. As before, keep the assembly centered, and all formers vertical.



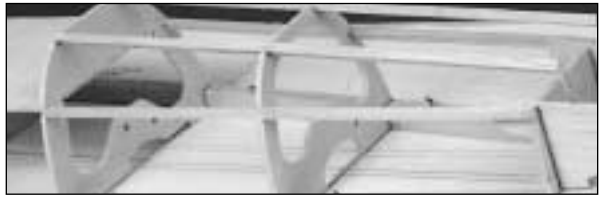
❑ 9. Glue one die-cut 1/8" ply **Tail Wedge** between the two Main Stringers, against the wax paper.

❑ 10. Glue the two halves of the die-cut 3/32" balsa **Cockpit Deck** together. Sand the joint smooth. Glue the Cockpit Deck to the top of F-4 and F-5 and into the notches in F-3 and F-6.

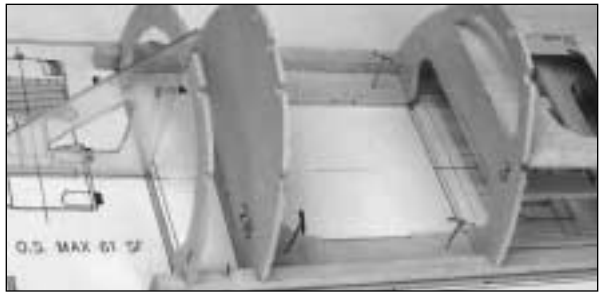
❑ 11. Glue a die-cut 1/8" balsa **Stabilizer Saddle** to the top of each Main Stringer aft of F-8. The forward points of the Saddles fit into the notches at the top end of F-8.



❑ 12. Glue the second 1/8" ply Tail Wedge inside the top of the Stab Saddle. Use a triangle to be sure that the assembly is vertical.

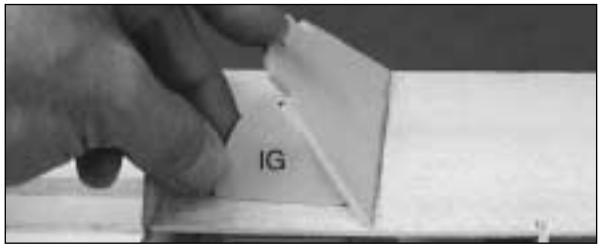


❑ 13. Cut 3/16" x 3/16" x 36" balsa **Stringers** to fit between F-6 and F-8 as shown in the photo. The top stringers should extend past F-8 by approximately 1/2". To avoid breakage, the top Stringers should **not be glued** in place until after the stab has been installed.

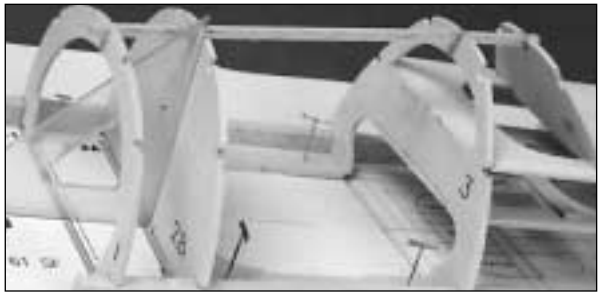


❑ 14. Glue **F-1** to the Main Stringers where shown on the plans.

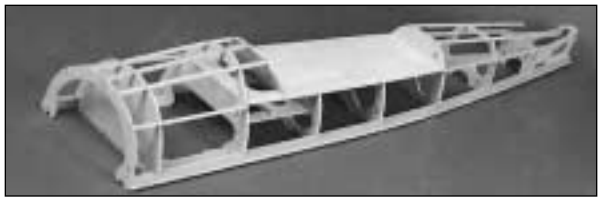
❑ 15. Bevel the bottom edge of the die-cut 1/8" **Instrument Panel (IP**) to fit flush against the Cockpit Deck when held at the angle prescribed by the die-cut **Instrument Panel Gauge**.



❑ 16. Use the die-cut 1/8" ply **Instrument Panel Gauge (IG)** to set the angle of IP, then glue IP to the Cockpit Deck.

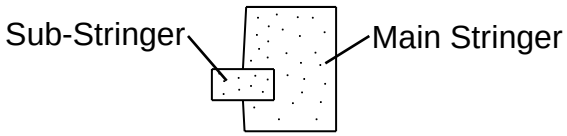


❑ 17. Cut 8-1/2" from a 3/16" x 3/16" x 36" balsa stringer. Insert the 8-1/2" stringer into the notches on the tops of F-1 through IP. About 1/4" of the Stringer should protrude past F-1. Glue the Stringer to F-3 and IP. Check F-1 and F-2B with a triangle to make sure that they are vertical, then glue them to the Stringer.



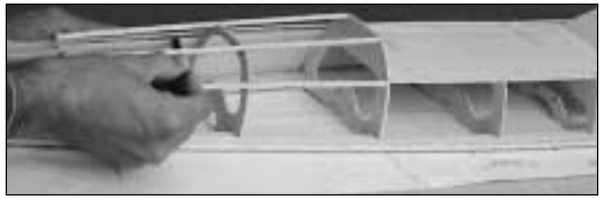
❑ 18. Cut, fit, and glue the remaining 3/16" square balsa Stringers to the forward section of the fuselage. Remember to check for warps or twists in the Formers as they can be straightened at this time.

❑ 19. Lightly sand all joints and blend the Stringers with the formers in preparation for sheeting. Pay particular attention to the junction of the lower rear 3/16" Stringer and F-8. The Stringer at this junction must be blended flush with F-8 to allow the sheeting to fully contact the former.

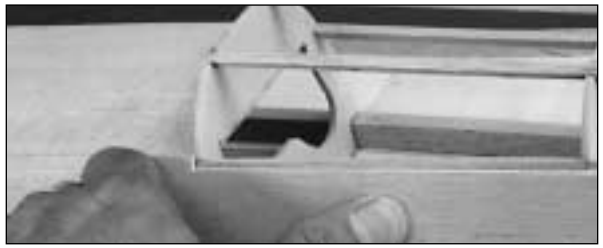


❑ 20. Glue two (of the four) 1/8" x 3/8" x 21" balsa **Sub-Stringers** into the groove in the left side Main-Stringer. Use Thin CA, wiping up any excess before it dries. Repeat for the right side. These Sub-Stringers will provide a ledge for the side sheeting.

SHEET THE FUSELAGE TOP FRAME



❑ 1. Pin one of the 3/32" x 3" x 42" shaped balsa **Fuse Sides** to the Main Stringer, with the **slightly curved** edge down. The notch for the stab is positioned next to the stab saddle, facing upward. Curve the sheet into contact with the frame, then use masking tape to hold it against the cockpit deck, tail, and nose. Trace the top edge of the **lower 3/16" Stringer** onto the Fuse Side, working from the i**nside** of the fuse. **NOTE:** Do not mark or trim the stab saddles yet. This will be done during step 3.



❑ 2. Remove the Fuse Side. Carefully cut away the excess material **3/32" below** the line you drew, from F-6 aft. *By so doing, the sheeting will divide the stringer in half and provide a gluing surface for the upper sheeting.* This sheet should be cut to fit flush with the top of the cockpit deck as shown in the photo. Check the fit on **both sides** of the fuse, then cut a second Fuse Side using the first one as a pattern.

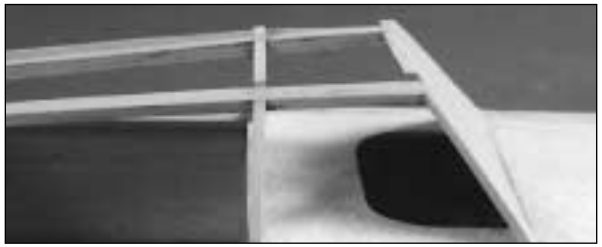
❑ 3. Use clothespins, T-pins, and tape to secure the trimmed Fuse Side in its final position on the frame. Hold a piece of thin cardboard (an index card or piece of a file folder) on top of the Stab Saddle, against the inside of the Fuse Side. Mark the stab Saddle contour using the cardboard as your guide. Don't press down on the cardboard with your pen or you will distort the shape. Remove the Fuse Side, then cut the Fuse Side to the Saddle outline you just drew. Repeat for the other Fuse Side.

❑ 4. Realign a Fuse Side with the frame, then wick some thin CA into the joint between the Main Stringer and the Fuse Side **starting midway between the front and back of the Fuse.** Carefully work outward in both directions along the Main Stringer holding the Fuse Side in tight contact with the Main Stringer as you proceed.

❑ 5. Wipe a damp paper towel over the outside surface of the Fuse Side to aid with curving the balsa.

❑ 6. Clip and pin (or tape) the top edge of the Fuse Side to the stringers and Cockpit deck. Wick thin CA into the joint but wipe off any

excess before it dries. Avoid using CA Accelerator as it will create lumps along the seam that will cause problems when you try to add the next piece of sheeting. **Note: Do Not glue the Fuse Sides to the top of the Stab Saddle. The sides will ultimately attach to the Vertical Fin Post.** Repeat steps 4, 5, and 6 for the other side.

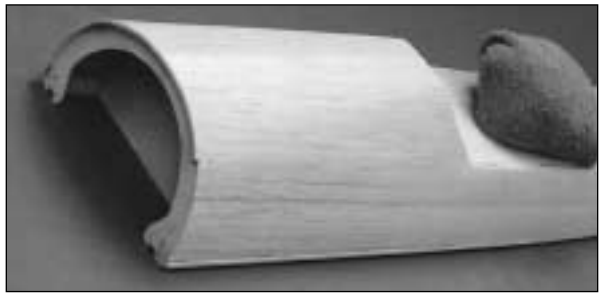


❑ 7. Trim and sand the top edge of the Fuse Sides flush with the top of the cockpit deck from F-3 to F-6. **Hint:** To simplify the Upper Forward Deck sheeting, trim away a sliver of Fuse Side sheeting from the edge of the cockpit deck forward, so that the Upper Deck sheet will only need a straight cut to make it fit.

❑ 8. Cut the **Upper Forward Fuse Deck** template from the plans and glue it onto thin cardstock (file folder). Use the template to cut t**wo** Upper Forward Fuse Deck sheets from a 3/32" x 3-1/2" x 24" balsa sheet.

❑ 9. Wet the outside of an Upper Fuse Deck sheet and **flex it with the grain** to soften it up, then place it on the upper forward frame. It should overlap the Instrument Panel and F-1 by about 3/8". Align the sheet along the centerline of the top Stringer, then temporarily hold it in place with clothespins. Mark and cut the lower edge to match the top edge of the Fuse Side.

❑ 10. Apply medium CA to all frame parts that the sheet will contact **except the top center stringer**. Roll the Deck sheet into position, starting along the lower edge. Hold it in position until the CA cures.



❑ 11. Repeat steps 9 and 10 for the other side of the fuse. After the Deck is sheeted on both sides, wick thin CA down the top center Joint. When the balsa is dry, lightly sand the joints with #220 grit sandpaper. Sand the sheeting flush with F-1.

INSTALL PUSHRODS

❑ 1. Locate the 48" **outer pushrod tube** and cut it into two lengths; one 22", and one 26". Roughen the outside surface with #220 grit sandpaper.

❑ 2. Install the 22" elevator pushrod tube as shown on the plans. Apply a drop of CA to the tube at each Former.

❑ 3. The Rudder pushrod exit is approximately 2-1/4" aft of F-8, and 1/4" above the Main Stringer ledge. Cut a 3/16" x 1-1/2" slot at this location for the 26" pushrod tube to exit. Bevel the sheeting where it contacts the tube to avoid bending the tube more than necessary. Install the tube as shown in the photo to allow for trimming later.

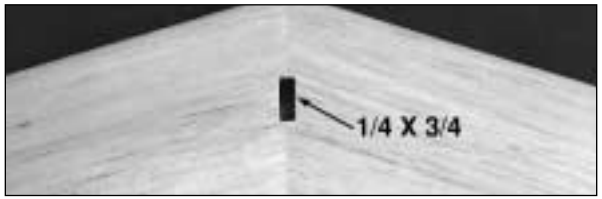
❑ 4. Cut one .074" x 36" **Pushrod Wire** to make an elevator pushrod 27-1/2" long. Cut six 1/8" long pieces of inner pushrod tube, then slide these along the wire to the locations shown on the plans.

❑ 5. Silver Solder a **Threaded Brass Coupler** to the unthreaded end of the pushrod.

❑ 6. Screw a Nylon Clevis **20 revolutions** (5/16") onto the threaded end of the pushrod wire. Locate the **Elevator Joiner Wire**. Snap the Clevis into the middle hole and lock it in place with the **Silicone retainer**. Slide the Brass end of the pushrod through the pushrod tube to the servo tray.

❑ 7. Cut a notch in the aft edge of the Stab Saddle as shown in the photo to provide clearance for the Elevator Joiner Wire.

ATTACH THE STAB AND FIN



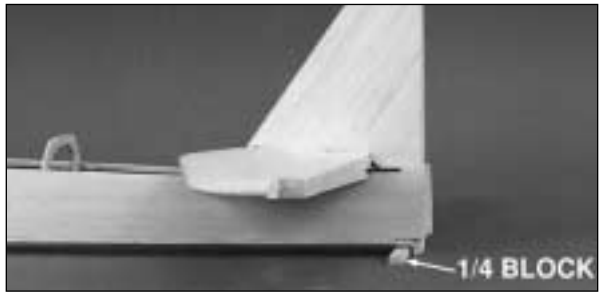
❑ 1. Referring to the plans, measure and cut the holes for the Fin LE through the top and bottom of the Stab.

❑ 2. Check the fit of the Stab with the Stab Saddle. Make any adjustments to the Fuse Sides very carefully, so that you **don't change the incidence angle** set by the inner Stab Saddles. If sanding is necessary, put masking tape over the top edge of the inner Stab Saddles.

❑ 3. Insert a 1/4" x 1/4" scrap balsa stick through the Fin slot in the Stab into the notch in F-8. Put the stab on the saddle and add a weight to hold it in place. Measure the height of each tip above the work surface and if not identical, make **small** adjustments to the Saddle and Fuse Sides. Use a string, pinned to the center of the top stringer at F-1, to equalize the distance of the Stab tips to the nose.

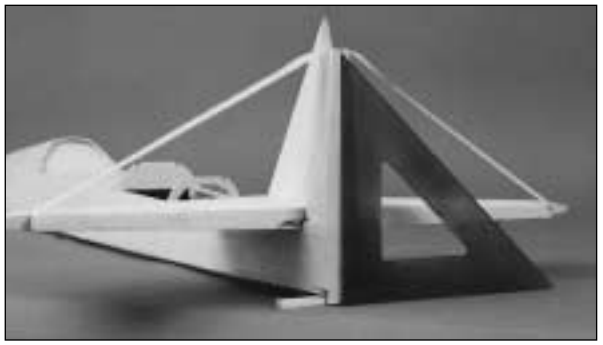
❑ 4. When the Stab is aligned with the Fuse, use pins in the Fuse and light reference marks on the Stab to help you put it back in the same position after the glue has been applied.

❑ 5. Apply 30 minute epoxy only to the **inner Stab Saddle pieces** (don't glue the Stab to the **Fuse Sides** until the Fin has been installed and the top has been sheeted) then fit the Stab in place. Apply a weight to hold the Stab in position until the epoxy cures. Double check alignment.



❑ 6. Block up the extreme aft end of the fuse on a 1/4" thick scrap of balsa. Trim the bottom edge of the **Fin Skin** to fit the contour of the stab. The **Fin Post** will touch the work surface and be flush with the Stab Saddles when the fit is correct. The Leading Edge should fit through the Stab and touch the **bottom** of the notch in F-8.

❑ 7. Accurately draw a centerline along the length of the Fin Post.



❑ 8. Apply 30 minute epoxy to the inside of the Fuse Sides where the Fin Post will attach and also along the Stab Saddle edges. Apply another dab of epoxy to the bottom of the LE tip. Work the fin into position, then use a **triangle to align the fin centerline at right angles to the work surface.** Masking tape may be used to hold the fin in position while the epoxy cures.

❑ 9. When the epoxy has cured, sand the excess **aft** Fuse Side balsa flush with the Fin Post.

COMPLETE THE FUSE TOP

❑ 1. If you haven't already done so, glue two 3/16" x 3/16" Stringers from F-6 to the top of the Stab. **Refer to the plans** for the angle that the Stringers need to be trimmed to blend with the top of the stab.

❑ ❑ 2. From a 3/32" x 3" x 15" balsa sheet, cut a piece 12-5/8" long to use to sheet the upper portion of the aft fuselage, from approximately 1-1/2" forward of F-6 to F-8. Carefully cut out the opening for the stab, testing the fit frequently. Trim the top edge of the sheet to extend only slightly above the top Stringer. Bevel the top half of the notch to allow the balsa to fit flush on top of the stab when bent to contact with the surface of the Stab.

❑ ❑ 3. Dampen the outside of the balsa sheet with water (to help with bending) then glue it to the top edge of the Fuse Side. Apply medium CA to the formers and top stringer, then roll the sheet into contact. Hold it in position until cured.

❑ ❑ 4. Repeat steps 2 and 3 for the other side of the Fuse.

❑ ❑ 5. While waiting for the sheeting to dry out, locate the 3/8" x 30" tapered balsa cockpit **Side Rail**. Cut the Side Rails to fit flush with the edges of the fore and aft cockpit sheeting. **Optional:** *If you prefer, the Side Rails may be cut to fit the length of the cockpit, from the instrument panel to F-6. Notch out the portions of the Side Rails that will fit behind the sheeting to allow the Side Rails to be flush with the cockpit edge.*

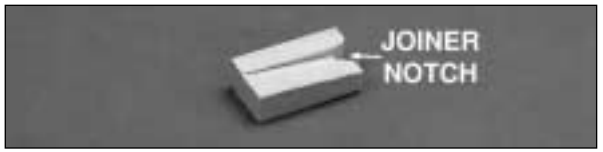
❑ 6. Use a sanding block or T-bar with sharp #220 grit to sand the top edge of the sheeting and stringers flat. Sand everything until flush with the tops of the formers.

❑ 7. Hold the 3/8" x 2-3/8" x 12" balsa **Top Deck Block** on top of the Stringers as shown on the plans. Trace around the underside with a pencil to establish the outline, then trim it to approximate size and shape. The aft bottom edge must be tapered to fit flush with the Stab top. When satisfied with the fit, glue it to the fuse with Medium CA.

❑ 8. Use a razor plane and a hobby knife with a long blade to finish carving the Top Deck to shape. Refer to the plans often to obtain the correct shape. Finish off the job with a sanding block.

❑ 9. Fill the cavity on the Stab, just ahead of the Fin, with a piece of scrap balsa.

❑ 10. Use model filler (Hobbico *HobbyLite* balsa colored filler recommended) to **start** blending the Top Deck with the Stab. Notice we said *start*. Model filler should be applied in layers, allowing each to dry between applications.



❑ ❑ 11. Cut two Rear Fairings from the 1/2" x 3/4" x 3-1/8" balsa block to fit from the Stab TE to the Fin TE. Notch out the blocks as shown in the photos to fit around the Elevator Joiner wire and the lip on the Fuse Sides.

❑ ❑ 12. Tape an Elevator in position, then mark the airfoil shape on the fairing. Trim and sand the Fairing to match the Elevator.

❑ ❑ 13. Turn the Fuse over and support the aft end off the work surface. **Hint:** *An inexpensive Robart Super Stand works well for this purpose, and because it's made of Styrofoam, can be modified to conform to the Fuse shape.* Stick masking tape to the bottom of the Stab and also the Fuse Side about 3/16" of an inch on either side of the joint. Mix some 30 minute epoxy, then squeeze it into the Stab/Fuse joint. Remove the tape before the epoxy cures and feather out the excess with your finger.

❏ ❏ 14. Once the epoxy has cured, apply more masking tape about 1/4" out from the joint, then use model filler to create a neat fillet along the length of the joint. Once again, remove the tape before the filler dries and feather the edges with your finger to avoid excessive sanding. *This is also a good time to fill in the opening around the rudder pushrod tube with filler.*

❏ 15. Repeat steps 13 and 14 for the top of the Stab.

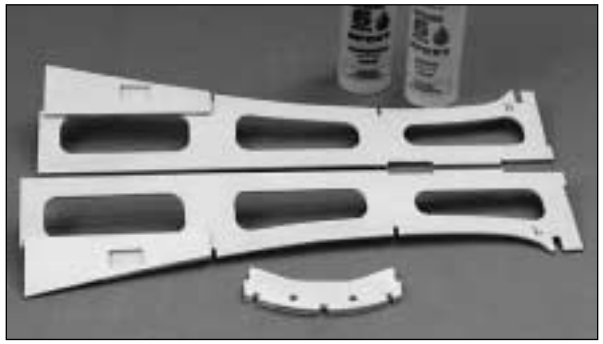
❏ 16. **Note: Protect the stab and fin skins with masking tape around where you will be sanding to avoid the possibility of dangerously thinning the skins.** Lightly sand the first layer of filler around the Stab and the Top Deck, then apply a second coat. This time start building it up around the LE of the fin so that the fin will blend smoothly with the Fuse. When the filler is dry use different thickness dowels wrapped with 220 grit sandpaper to shape the fillet. *Take your time to blend all contours with the Fuse.*

This will finish the top half of the fuse, except for final sanding and covering. Take a breather to admire you work, then turn the assembly over and add glue fillets to the inside, wherever you see a need. You might even want to take a minute to trim the canopy to size and check the fit. Looking good!

FRAME THE FUSE BOTTOM

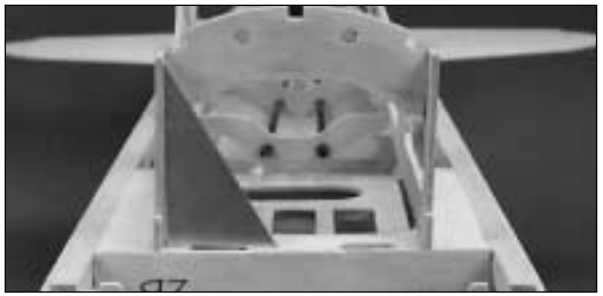
From here on you **will need a cradle** to support the Fuse. As mentioned earlier, you can use a ready-made stand or a Styrofoam ice chest can be shaped to do the job.

❏ 1. Locate the right and left die-cut 1/8" ply **Wing Saddles**. If you hold them together you will notice that one is longer than the other. The ***longer one fits the left side*** of the fuse (or to your right when the fuse is upside down). Check the fit of both parts with the notches in the forward crutch, then **mark the insides** of both parts.



❏ 2. Use 6-minute epoxy to glue the die-cut 1/8" ply **Wing Block Doublers** to the **inside** surface of the Wing Saddles. Be sure that the aft edge is flush with the notched portion of the saddle and that the bottom edge is flush with the bottom of the saddle as shown in the photo.

❏ 3. Use 6-minute epoxy to glue the two die-cut 1/8" ply **Wing Dowel Formers** together.

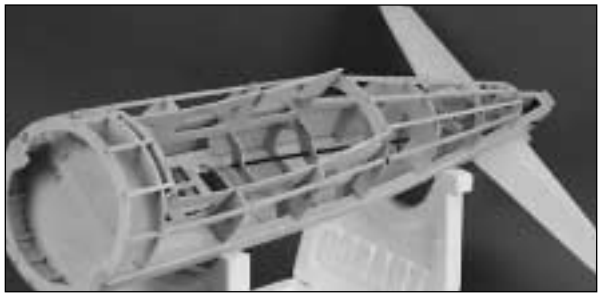


❏ 4. Test the Wing Saddles with the forward Crutch. Test fit the Wing Dowel Former with the Wing Saddle. When satisfied with the fit, glue all components together with medium CA. **Apply a fillet of CA** along the joint between the Wing Dowel Former and the Saddle. **Note:** Use a triangle to square up the Saddles with the Fuse.

❏ 5. Glue the die-cut 1/8" ply **F-2C, F-3B, F-4B,** and **F-5B** to the Wing Saddle and top Formers as shown in the photo. Make sure that the die stamped numbers face forward and that all parts fit their respective notches. Check that F-2C is **even** with F-2B by holding a short straightedge across the joint.

❏ 6. Glue **F-6B, F-7B,** and **F-8B** in position as shown on the plans. Use a straightedge to maintain vertical alignment between top and bottom Formers. **Hint:** *For better bonding with the sheeting, lightly sand the formers' edges so that they are slightly beveled to match the angle of the fuse.*

❑ 7. Stand the Fuse up on its nose on a sheet of waxed paper. Add a weight to the inside of the F-2 Formers. While the Fuse is in this position, glue **F-1B** into the notches of F-1. Glue three forward **3/16" x 3/16" stringers** from F-1B to the Wing Dowel Former to maintain alignment of F-1B. When the glue has dried, put the fuse back into the cradle.



❑ 8. Glue 3/16" Stringers between F-1B and the **center** of F-5B. Glue five 3/16" Stringers between F-5B and F-8B. When everything is dry, lightly sand all joints and even up the stringer ends with the Formers.

❑ 9. Use **a liberal amount of 30-minute epoxy** to glue the 1/2" x 7/8" x 7/8" **Maple Wing Mount Blocks** into the recessed locations in the Wing Block Doublers. Use small clamps to hold them in position while the epoxy cures. For additional strength you may add a couple of scraps of 3/16" balsa to the underside (toward the cockpit floor) of the blocks before the epoxy hardens.

SHEET THE FUSE BOTTOM

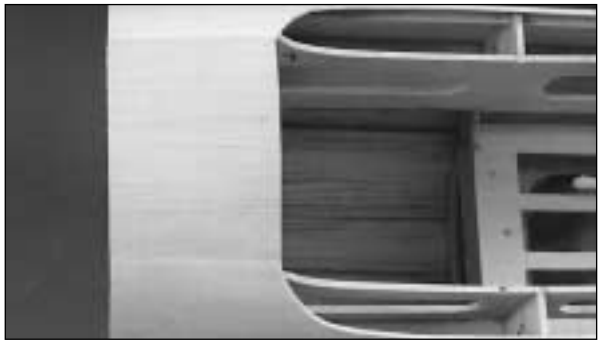
❑ 1. Cut two **Lower Fuse Sheets** from 3/32" x 4" x 42" balsa to match the pattern on the plans. The cut sheets will be slightly oversize to allow for final fitting and sanding.

❑ 2. Position a side sheet on the Main Stringer ledge with the vertical portion (at the wing TE) flush with the forward edge of F-5B. Press the sheet against the Main Stringer at F-5B and wick thin CA into the joint, from the **inside**. Starting at F-5, work forward and aft, **tack gluing** the sheet in place as you proceed. When the length of the sheet has been tacked in place, go back and wick thin CA along the entire inside edge.

❑ 3. Trim the length of the aft section of sheeting to fall on the centerline of the 3/16" Stringer. **Hint:** *Use masking tape to hold the sheeting in position along the Stringer, then use a metal straightedge an a hobby knife to cut off the excess from F-5B to the Fin Post.*

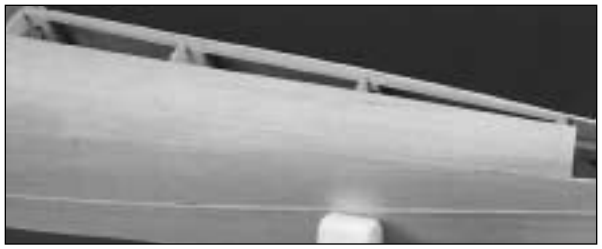
❑ 4. Bend the sheet into contact with the aft Stringer, then wick thin CA into the joint. Again work forward and aft from F-5B outward. If the balsa sheet feels stiff, use water on a paper towel to moisten it. Finish attaching the sheet by wicking CA into all former joints along the length of the sheet. Wipe any excess CA from exposed edges before it cures.

❑ 5. Repeat the previous three steps for the opposite side.



❑ 6. Locate the two 3/32" x 4" x 24" balsa **Bottom Sheets.** Cut a 4" x 2-5/8" piece from **one** of the sheets. Trim this small sheet to fit the bottom of the forward Fuse. CA the sheet in position when it fits.

❑ 7. Cut two scraps of 3/32" balsa to fit between the ply Wing Saddle and the Lower Sheet at F-5B. Glue them in place as shown in the photo. These pieces will hold the sheeting in alignment and provide support for the aft edge.



❑ 8. Cut the 3/32" x 4" x 24" balsa (and the remaining sheet from step 6) to fit the bottom of the fuse from the lower sheeting edge to the centerline of the center stringer. Dampen the outside of the sheeting to help with bending it around the Formers. When satisfied with the fit, glue it in place with medium CA. Wick thin CA along the top joint. Sheet both sides.

❑ 9. Trim and sand the bottom sheeting flush with F-1B, F-5B and F-8B.

❑ 10. Use a sanding block to sand the aft end Fuse sheeting to taper from F-8B to the bottom edge of the Fin Post as shown on the plans.

❑ 11. Fit the 7/8" x 2-1/2" x 6-1/4" **Aft Fuse Block** in position. Sand the forward end of the Block to fit flush against F-8B. Sand the aft edge flush with the Fin Post. Put the Block in position and trace around the underside and forward edge to form a rough cutting outline. Tape the Rudder in position so that you can trace the outline on the aft edge of the Block.

❑ 12. Use a hobby knife and a razor plane to roughly shape the Aft Fuse Block, then glue it in position.

❑ 13. Continue shaping the Aft Fuse Block to blend with the fuse. Spot glue or tape the rudder in position. Shape the Aft Fuse Block and the rudder LE to blend smoothly with the fuse. When satisfied with the fit, remove the rudder.

❑ 14. Sand the LE of the rudder to a "V" shape as shown on the plans

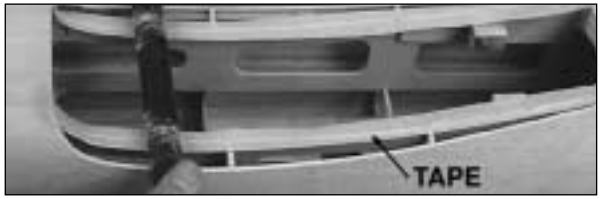
❑ 15. Cut a **slot** in the tail post base to accept the **Nylon Tail Gear Bearing** as shown on the plans. Slip the bearing in place. Hold the rudder in position, then mark the location of where the wire will plug into it. Drill a 1/8" hole about 1/2" deep at this spot. Cut a groove in the rudder leading edge to allow the wire to be recessed (like the elevator joiner wire).

❑ 16. Sand off the **protruding portion** of the 1/8" balsa stringer from around the upper and lower **fuse sheeting joint.**

❑ 17. Touch up any of your fillet work with a thin coat of filler so that it can be drying while you do the next few steps.

MOUNT THE WING TO THE FUSELAGE

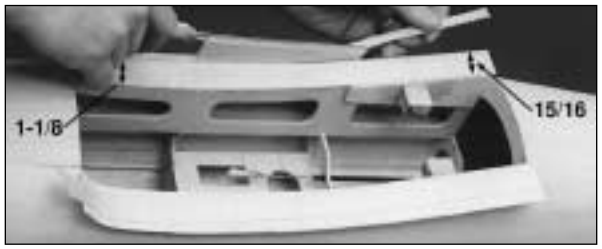
❑ 1. Run a 1/4" drill through the Wing Dowel Former to **clean out** the holes so the dowels will fit through.



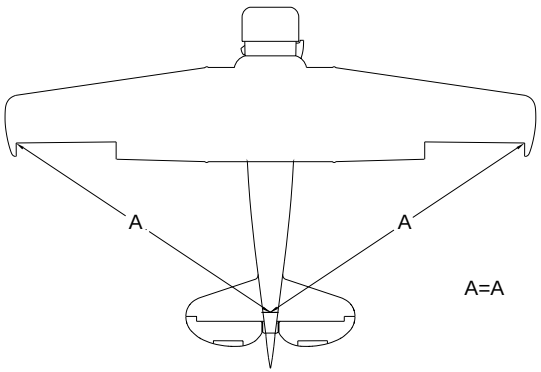
❑ 2. Put masking tape over the top edges of the ply Wing Saddle to protect the contour, then carefully sand the **balsa** Saddle to the match the ply. **Hint:** *Sand until the masking tape just starts to show signs of being scuffed along its entire length. Use a 3/4" - 1" dowel (or a piece of an **old** broom handle) wrapped with #220 grit to sand the curve at the forward section of the Saddle.*

❑ 3. Cut ten pieces of Saddle sheeting 1-3/8" x 3" from a sheet of 1/16" x 3" x 30" balsa. Glue five pieces together to make a cross-grain strip 1-3/8" x 15". Sand off the glue seams with sharp #220 grit sandpaper.

❑ 4. Apply medium CA to the **ply Saddle only**, then align the sheeting strip flush with the inside edge of the ply Saddle and glue it in place. Repeat this operation for the other side.



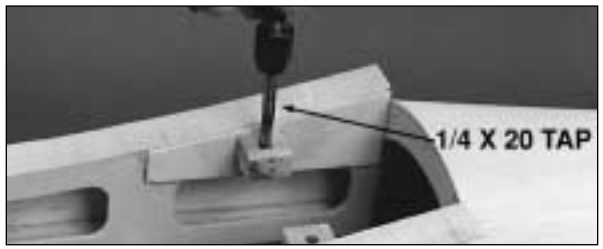
❑ 5. Measure and mark 1-1/8 " from the **inside edge** of the ply Saddle 1-1/4" aft of the dowel Former. Measure and mark 15/16" from the inside edge of the ply Saddle at F-5B. Connect these two marks with a strip of masking tape. Trim and sand the sheeting to this line.



❑ 6. Install the wing and check the fit. Make adjustments as necessary. Hold a string (with one end attached to a pin centered at the tail) up to a wing tip. Put a piece of tape on the string to mark the intersection of the string and the wing tip. Swing the string over to the other wing tip and check to see if the distances are the same (see diagram). Adjust the position of the trailing edge of the wing until the wing is properly aligned.

NOTE: Make sure the wing is held securely and cannot shift while you are drilling the mounting holes.

❑ 7. With the wing aligned and taped in place, **lightly mark** the center of the wing mount holes on the mount blocks with a 1/4" drill.



❑ 8. Remove the wing and finish drilling the holes with a #10 (or 13/64") drill bit through the wing mount blocks. Tap the holes with a 1/4"-20 tap. Add a couple drops of thin CA to the holes to harden the threads, then re-tap the holes after the CA has fully hardened.

BUILD THE WING FILLET

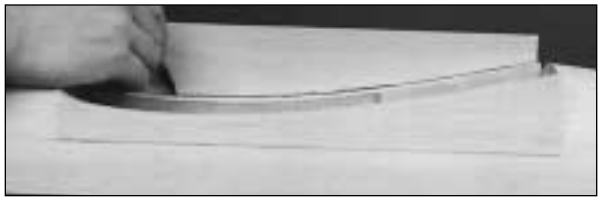
NOTE: There are many techniques to build a wing fillet. Some modelers prefer to carve the entire fillet from balsa. Others use a mixture of epoxy and micro balloons to finish the fillet. If you have a favorite technique, feel free to use it. The technique described below works fine for MonoKote-covered aircraft.

❑ 1. Draw (or tape) a reference line along the upper & lower Fuse joint. Measure 1-1/2" towards the Saddle, then draw a line parallel to the reference line.

❑ 2. Cover the center section of the wing with waxed paper or plastic wrap, then bolt the wing in position.

❑ 3. Press the 1/16" balsa saddle sheeting into contact with the wing, then run a bead of thick CA along the seam between the balsa saddle and the balsa saddle sheeting. This technique will take care of any unevenness on the wing's surface. The wing may be removed after the CA has cured.

❑ 4. Position the die-cut 3/32" **Wing Fillet Formers** at the locations shown (dotted line) on the plans. There are three formers per side. Glue the formers in place. Sand them flush.



❑ 5. Cut two 13-1/2" long **Fillet Skins** from 1/16" x 3" x 30" balsa sheet. Taper one long edge to blend with the Fuse. Hold the skin against the Fillet Formers, even with the **fillet** reference line, then trace the outline of the saddle on the inside surface. Cut away the excess when marked.

❑ 6. Glue the Fillet Skins in position. Lightly sand the top edge with a sanding block. Apply a thin layer of Balsa Filler along the *long* edge and also at the forward end to start building up the LE contour.

❑ 7. Use the templates provided on the plans to cut **two sets** of Rear Fillet parts from 1/16" balsa. Taper (to a sharp edge) the edges of each part that will contact the fuse sheeting. Glue the parts to the fuse in the order shown in the photo. Test fit each piece as you proceed, then use medium CA along the edges. Lightly sand the joints, then apply a thin layer of balsa filler to blend and contour the edges with the fuse.

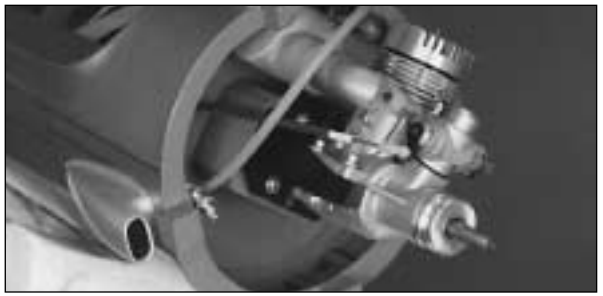
❑ 8. When the filler is dry, sand and blend the fillet with the fuse. Add extra filler as needed to obtain smooth curves.

With regards to building, you are on the home stretch. Get a good night's sleep, then play hooky from work to do the final assembly steps.

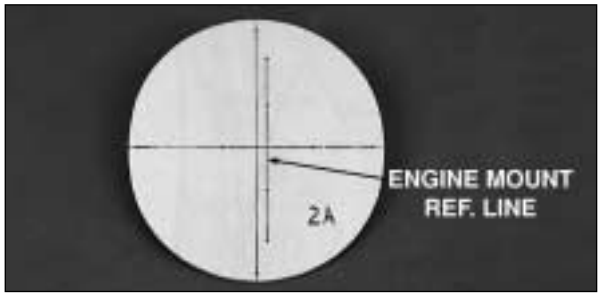
INSTALL THE ENGINE

You have a variety of options when it comes to engine selection. Our original prototype weighed 8.75 lbs and flew **extremely well** with an **O. S. .61SF** 2-stroke for power. We have also successfully flight tested the model with an O.S. 1.20 Surpass 4-stroke engine. Due to the high lift design of the wing, the Texan will have a tendency to climb as full power is applied when using a 1.20 4-stroke engine. This condition can be controlled by adding an **additional one degree of down thrust** to the engine.

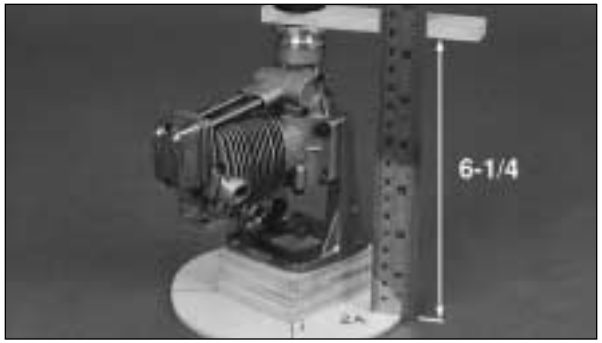
NOTE: The following sequence shows the installation of an O. S. .91 Surpass 4 stroke engine. We mounted all test engines at a 45 degree angle towards the bottom of the fuse. This orientation allows the exhaust port of a 2-stroke engine to be connected to a **Top Flite In-Cowl Muffler** and to exit the cowl via the *"scale"* exhaust stack.



If you plan on using the Top Flite In-Cowl Muffler, you will have to do a little sanding on F-1 to provide clearance for the muffler and to permit access to the mounting screws. To **strengthen** the sheeting in the area that the muffler (and scale exhaust stack) will exit the fuse, add some scrap 3/32" balsa between the stringers, from the firewall to F-1.

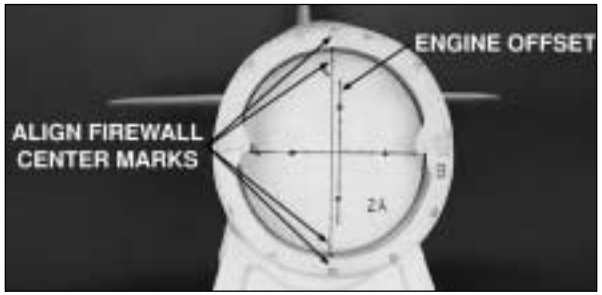


❑ 1. Draw reference lines through the dots that are stamped into the die-cut 1/8" Birch ply **F-2A Firewall.** The short **offset line** is to be used for the centerline of the engine and will allow the prop to be centered in the cowl opening. *Remember, the Firewall already has been built with 2 degrees of right thrust.*



❑ 2. Bolt your engine to an engine mount, then position it on the F-2A Firewall. Add plywood shims, as required, to position the **propeller backplate 6-1/4" from the Firewall** (this applies to all engines).

❑ 3. Glue the plywood shims together. Center the engine mount on top of the shims and mark the mounting hole locations. Center the mount on F-2A using the **offset** line for horizontal alignment. Drill the mounting holes with a 5/32" bit.



❑ 4. Center F-2A on F-2B/F-2C. Use the center joint between the formers and the two punch marks on the top and bottom for alignment. **Note:** When doing this alignment, make sure that the Fuse is **right-side-up** and that the **offset line is to your right (or the pilot's left).** Use the **vertical centerline,** not the offset line, to align the Formers (refer to the firewall drawing on the fuse plans).

❑ 5. Hold F-2A in position, then mark the mounting holes on F-2B/F-2C. Drill these holes with an 11/64" bit to accommodate the blind nuts. Check inside the fuse to see where the holes are in relation to the blind nut cutouts on the forward crutch. Enlarge the cutouts, if necessary, to accommodate the 1/8" ply **Firewall Backups.** *See photo for step #7.*

❑ 6. Locate the four pre-cut 1/8" x 3/4" x 3/4" Birch ply **Firewall Backups.** Drill an 11/64" hole in the center of each. Insert the supplied 6-32 engine mount blind nuts into each ply Backup, then gently seat them with a hammer.

❑ 7. Insert the supplied **6-32 x 2-1/2"** engine mount screws through the mount, spacer shims, and firewall to check the fit. Screw the blind nuts **onto** the mounting screws from inside the fuse. Glue the blind nut assemblies in position on the **inside** of the firewall with CA. ***Hint:*** *work some petroleum jelly into the threads to prevent any stray glue from causing problems. Use a cut-off wheel and Dremel tool to trim excess screw length.*

❑ 8. Once the blind nuts are installed, remove the engine mount assembly. Coat the back side of F-2A with 30-minute epoxy, being careful to stay at least 1/4" clear of the screw holes. Align F-2A with F-2B/F-2C, then install the engine mount with all four screws to *clamp* F-2A in position while the epoxy cures.

FIT THE COWL TO THE FUSE

❑ 1. Make a simple tool to mark the inside of the cowl by inserting a T-pin through a small block of balsa, **3/16"** above the work surface. *3/16" is the distance the cowl will extend over the Fuse sheeting.*

❑ 2. Work on a flat surface. Hold the marking tool with the point against the **inside** of the cowl, then **rotate the cowl** to scribe an even line around the inside circumference.

❑ 3. Center the cowl over the Baffle Template, then mark the four centerline positions around the perimeter of the cowl. These four points will be your mounting block locations.

❑ 4. Measure and mark exactly 7/16" from the rear edge of the cowl at each of the four points. ***Hint:*** *Use the same gadget that you made in step #1, just reposition the T-pin to 7/16".*

❑ 5. Drill a 1/8" hole at each of these locations.

❑ 6. Locate the four 1/2" x 5/8" x 3/4" Maple **Cowl Mounting Blocks.** Slightly curve a 1/2" x 3/4" side to match the cowl contour on each of the four blocks.

❑ 7. Hold the blocks inside the cowl, centered on the 1/8" hole, even with the scribed line, as shown in the photo. Mark the location of each hole. Drill a 3/32" pilot hole on the marks of each block. Attach the blocks to the cowl with four #4 x 1/2" screws and four #4 washers. Make sure that they are aligned with the scribed marks.

❑ 8. Put a dab of 6 minute epoxy on the back of each block, then fit the cowl in position on the front of the fuse. Align the blocks with the center stringers, top, bottom, left, and right. The small open areas on each side are designed to allow engine cooling air to exit the cowl. When centered, use masking tape to hold the cowl in position until the epoxy cures. ***Hint:*** *If you keep the Fuse in a nose up position, gravity will help hold the cowl in position.*

❑ 9. After the epoxy has cured, mark the "TOP" of the cowl on the inside, then unscrew it. Add a substantial fillet of fresh epoxy around each block for added strength.

FIT THE COWL TO THE ENGINE

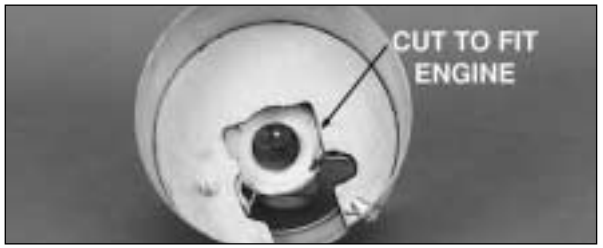
❑ 1. Mount the engine. Install the needle valve, and, if you will be using a 4-stroke engine, the choke control wire.

❑ 2. Use thin cardstock or a file folder to make **location templates** as shown in the photo. Securely tape these templates to the fuse a few inches behind the forward edge.

❑ 3. Remove the control extensions and engine but leave the templates in place. Slide the cowl under the templates and screw it in position. Use a pen to trace the openings on the cowl. Remove the cowl, then use a Dremel tool (or power drill and a round file) to cut the openings.

❑ 4. Put the engine back on the mount with a couple of screws, then check the fit of the cowl openings. Make adjustments as necessary, a little at a time.

IMPORTANT: Fully cowled engines **require** a baffle to direct air flow over the cylinder and to limit the amount of heated engine air that must exit the enclosure.



❑ 5. Cut an **engine baffle** from 1/8" lite ply (not included) using the Baffle Template on the plans. *A Top Flite Dummy Radial Engine (TOPQ7901)* may be glued to the front of the baffle to dress up the front of the model. ***If you plan on using a Dummy Radial, skip the rest of this step, but refer back to it after the cowl has been painted.*** Epoxy the baffle into the front end of the cowl with the open area in front of the engine cylinder. Use a file (or Dremel drum sander) to fit the opening to the engine you are using. Be sure to allow adequate clearance for throttle movement through its full range. Also notice in the photo the **fuel filler valve** (GPMQ4160) and the **air filler valve.**

❑ 6. Drill a 3/8" hole in the cowl across from the carb to install an optional fuel filler valve (GPMQ4160). Drill a 1/2" hole, if required, for the glow plug battery connection. Cut an opening for the engine muffler (if required), or to allow heated air to exit the cowl.

FIT THE FLAPS

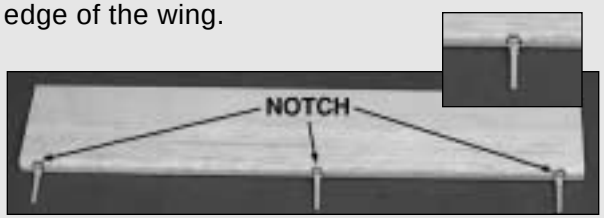
DO THESE STEPS FOR **OPERATING** FLAPS

❑ ❑ 1. Mark the locations of the hinges on the wing and flaps *(You should have already done this step, but if not, check the wing plans for the locations).*

❑ ❑ 2. Use a T-bar to true up the aft edge of the wing sheeting in the flap section.

❑ ❑ 3. Sand a **radius** from the LE of each Flap around to the sheeted side (See the cross-section on the wing plan for the required radius).

❑ ❑ 4. Test fit the flaps. Check that all edges are flush. **NOTE:** The aft edge of the flaps should match the aft edge of the wing. Also the flaps should lie flat against the trailing edge of the wing.



❑ ❑ 5. When a good fit is obtained, install the **Pivot Point Hinges** (GPMQ4003). **NOTE:** The hinges are **not glued** in until **after** the finish has been applied. Drill 1/8" holes at the hinge locations. Use a sharp #11 knife to cut a notch in the leading edge of the flaps at the hinge locations. This will allow the hinge to pivot in the **center of the flap's LE radius** (refer to the cross-sections on the wing plan).

❑ ❑ 6. Plug the flaps with the hinges into the wing. Check the fit and run the flaps through their complete range of motion. The TE of the flaps should swing 1-1/2" away from the TE of the wing. Make any required adjustments until the flaps swing freely. Remember, the flaps must **close flush** against the wing TE.

❑ ❑ 7. Insert the wire joiners into the brass tubes and test the operation. Once again, make adjustments as needed to assure smooth operation.

FINAL FIT THE RETRACTS

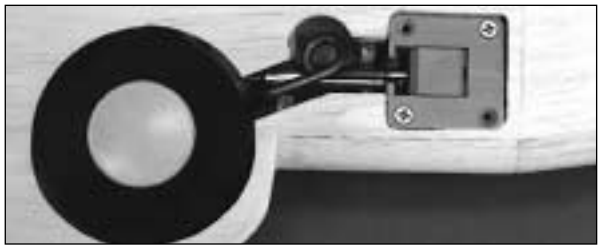
DO THESE STEPS FOR OPERATIONAL LANDING GEAR.

❑ ❑ 1. Temporarily install the retract mechanism.

❑ ❑ 2. Install the wire landing gear strut and wheel. Carefully swing the strut down to contact the wing. Draw a line around the wheel to mark the area of sheeting to be removed.

❑ ❑ 3. Cut away the sheeting from the inside of the circle, leaving yourself room to make adjustments with a drum sander.

❑ ❑ 4. Cut away as much of the wing rib as necessary, being careful not to remove more than required.



❑ ❑ 5. Fit the wheel in position. There should be about 1/8" clearance around the wheel.

❑ 6. Repeat steps 1 - 5 for the other side.

FIT THE FIXED GEAR

DO THESE STEPS FOR FIXED LANDING GEAR

❏ ❏ 1. Insert a 3/16" bent wire landing gear leg into the hole in the torque block that you drilled during the wing's construction. Press the wire all the way into the landing gear groove.

❏ ❏ 2. Refer to the plans for the location of the Nylon Landing Gear Straps, then trace the strap's outline onto the sheeting. Carefully cut away balsa from the locations down to the hardwood landing gear rails. This will allow the straps to be recessed flush with the surface of the wing.

❏ ❏ 3. Mark the location of the screw holes through each of the gear straps. Drill 1/16" pilot holes through the landing gear rails at each of these marks. Be careful **not to go through** the top skin of the wing.

❏ ❏ 4. Remove the landing gear. **After covering**, the gear is permanently mounted using the nylon straps and #2 x 3/8" screws.

FINISHING

FINAL SANDING

Nearly every imperfection in your wood structure will show through the covering material; therefore, before covering, you should make a final check of the entire structure. Fix any "dings," then sand the entire structure smooth using progressively finer grades of sandpaper.

FUEL PROOFING

Fuel proofing may be done after covering.

❏ 1. Fuel proof the engine compartment, paying special attention to the firewall. Gray (mix black and white) K&B epoxy paint or 30 minute epoxy is recommended.

❏ 2. Fuel proof any external exposed wood (*e.g.* flap pushrod exits). Matching brush-on Perfect Paint works nicely here.

BALANCE THE AIRPLANE *LATERALLY*

SPECIAL NOTE: Do not confuse this procedure with "checking the C.G." or "balancing the airplane fore and aft." That very important step will be covered later in the manual.

Now that you have the basic airframe nearly completed, this is a good time to balance the airplane **laterally** (side-to-side). Here is how to do it:

❏ 1. Temporarily attach the wing and engine (with muffler) to the fuselage.

❏ 2. With the wing level, lift the model by the engine propeller shaft and the fin post (this may require two people). Do this several times.

❏ 3. If one wing always drops when you lift the model, it means that side is heavy. Balance the airplane by gluing weight to the other wing tip. **NOTE: An airplane that has been laterally balanced will track better in loops and other maneuvers.**

FINISHING REFERENCE BOOKS

The AT-6 does not require much painting to obtain the scheme shown on the box, as most of the finish is done with Top Flite MonoKote. The only painting that is required is for the plastic parts, wheel wells, and the inside of the flaps. There are many other schemes used on AT-6s, but the one shown on the box has proved to be highly visible in the air and is "scale" for an instrument flight trainer.

Here are two of the many books available that have useful AT-6 information.

1. **T-6 in Action**, Squadron/Signal Publication, Aircraft No. 94.
Good general AT-6 information. Has many black and white photos and color illustrations of various AT-6s. Very helpful.

2. **T-6 Texan, The Immortal Pilot Trainer**, Motorbooks International.
More good stuff! Hundreds of great color photos showing lots of details and a wide variety of color schemes.

COVER THE STRUCTURE WITH MONOKOTE

The technique we will describe here is how the model pictured on the box was finished. In general, it involves covering most of the model with MonoKote, then priming and painting the cowl and surface details.

Make sure the structure is smoothly sanded with **320 grit** sandpaper. Remove all dust from the structure so the Monokote will stick well.

Cover the aircraft with MonoKote following the sequence below. Make sure the MonoKote is thoroughly stuck down to the structure and all of the edges are sealed. Use a **Top Flite MonoKote Hot Sock** on your covering iron to avoid scratching the MonoKote.

NOTE: When covering areas that involve fillets and sharp junctions, like the tail section of the AT-6, cut narrow strips (3/8" to 5/8") and apply them in the corners **before** covering the major surfaces. The larger pieces of MonoKote will overlap and capture these smaller pieces. This technique also bypasses the need to cut the MonoKote in these areas after it has been applied. **DO NOT, under any circumstances, attempt to cut the covering material after it has been applied to the fin and stab, except around the leading and trailing edges and the tip.** Modelers who do this often cut through the covering and part-way into the balsa stab skin. This can weaken the stab to the point where it may fail in flight!

Recommended Covering Sequence:

1. Tail Fillet Strips as described in above note
2. Rudder left side
3. Rudder right side
4. Bottom of elevators
5. Top of elevators
6. Stab bottom
7. Stab top
8. Fin left side
9. Fin right side
10. Fuse color band*
11. Wing fillet (on fuselage)**
12. Fuse bottom
13. Fuse sides
14. Fuse top
15. Ends of ailerons and flaps
16. Bottom of ailerons and flaps
17. Top of ailerons
18. TE surfaces of wing (at ailerons and flaps)
19. Bottom of left wing panel
20. Bottom of right wing panel
21. Bottom of center panel (overlap covering 1/4" at the outer panels)
22. Top of left wing panel (overlap covering 1/4" at wing LE)
23. Top of right wing panel (overlap covering 1/4" at the LE)
24. Top of center wing panel (overlap covering 1/4" at the outer panels)

*A pattern has been provided to aid in cutting the wrap-around fuselage color band.
**When covering concave surfaces, follow the iron with a damp cloth, pressing the covering down.

APPLY THE DECALS

NOTE: The decal sheet does not give you everything you need to completely trim your model, but it does provide all the intricate detailing and difficult items, including some Army and Air Force markings.

1. Study the plans and the photos on the box to decide where to place the decals.

2. Thoroughly clean your airplane before applying decals.

3. Trim the decals as close as practical. Carefully apply the decals to the model.

NOTE: Certain decals (such as "No Push," etc.) are provided and may be used at your discretion. Our scheme deviates from true scale because we incorporated the "6 of Diamonds" emblem from another aircraft of the same type to the scheme shown in the Frank Tiano documentation pack.

DRAW THE PANEL LINES ON THE MODEL

(OPTIONAL)

Inked-on panel lines are easy to draw and enhance the model's appearance. For the most accurate results, refer to the 3-view drawings from Scale Model Research for placement of the lines. You may also use the pictures on the box for reference.

To draw the panel lines we used a **Staedtler Lumocolor 313 Permanent** fine point pen. These pens are available from engineering/drafting supply stores. We suggest using this pen because it works well on MonoKote and mistakes can be removed with 70% rubbing alcohol. Your model may be cleaned with most cleaners without seriously affecting the lines. Remember, you can easily do touch-ups with this method.

HINT: Apply a strip or two of masking tape to the bottom side of the ruler about 1/8" from the edge. The tape will add friction so the ruler won't slide and prevents the ink from wicking under the ruler.

ASSEMBLE THE AIR INTAKES AND EXHAUST STACK

❏ ❏ 1. Cut out the front and rear sections of the plastic *oil cooler* and *carb* **Air Intakes.** Sand the edges smooth.

❏ ❏ 2. Test fit the parts together, then roughen the inside mating surfaces and glue them together with CA.

❏ ❏ 3. Repeat steps 1 & 2 for the **Exhaust Stack.**

❏ ❏ 4. Use fiberglass resin automotive filler to fill in any gaps between the parts. Use a sanding block to level out the surfaces. **Hint:** *Wet sanding works very well on automotive filler.*

❏ ❏ 5. Fit the Air Intakes to the fuse. You will probably need to sand the underside of the intakes to a slight radius to blend with the sheeting.

Note: *If you will be installing a 2-stroke engine with a Top Flite* ***In-Cowl Muffler****, don't cut the hole for the exhaust stack until the muffler has been installed. You will find that by using a* ***Hobbico Exhaust Diverter*** *(#HCAP2175) the exhaust can be routed out through the scale exhaust stack.*

PAINTING

Paints used on the prototype:
We used K & B Super Poxy primer and color coat for everything **except** the **Canopy frame**. K & B has been known to **attack butyrate plastic,** so we used ***Chevron Perfect*** for the Canopy.

Surface Preparation

Mix **equal parts** of K & B primer, hardener, and thinner, then stir well. Spray the **Cowl, Air Intakes,** and **Exhaust Pipe** with a **thin** coat of primer. Add a second coat of primer to areas that need it. Mask the wing (plastic garbage bags work well for this) around the plastic **LE Fairing,** then apply primer to prepare the Fairing for paint. Wet sand the primer with 320 and 400 grit sandpaper using a block where possible. Most of the primer should be sanded off.

Cut the excess material from around the **Canopy,** then sand off the rough edges with 320 grit sandpaper. Mask the window panes with vinyl electrician's tape or Frisket film (available at art supply stores).

Apply the colors

Spray the **aluminum** parts with K & B Super Poxy (but **not** the canopy). Spray the **canopy frame** with Chevron Perfect. The inside of the flaps and wheel wells may be painted **zinc chromate green** with a brush. We mixed the Zink Chromate Green color by combining K & B Super Poxy : roughly 5 parts yellow, 1 part blue, and drop of black. Wet sand any rough parts with 400 to 600 grit sandpaper.

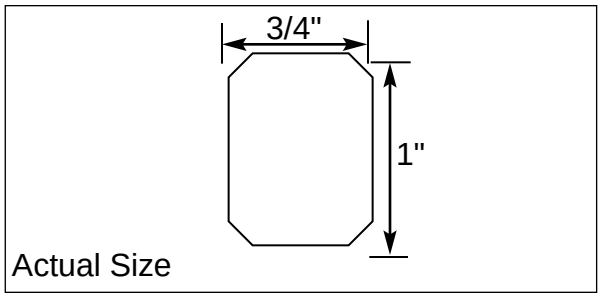
We custom mixed the K & B paint to match the red MonoKote by mixing a little yellow into their standard red color. Start with 6 parts red and 1 part yellow. A drop or two of black may be needed to obtain an exact match. Keep a swatch of MonoKote handy to test and compare the color on a regular basis.

Note: All paints dry slightly darker than they appear while wet. Spray on the color coat when satisfied with the match.

K & B paints are not difficult to use if you have spray equipment. Use equal parts of the color paint (Part A) and hardener (Part B), mix well, then thin the mixture with K & B Thinner so that it can be sprayed. (e. g. 1 oz. Part A, 1oz. part B, 1oz. Thinner)

HINGING

NOTE: Hinging is usually done after covering and painting. The hinge locations are shown on the plans. Use a #11 blade in a hobby knife to cut the hinge slots.



❏ 1. Cut 15 hinges (3/4" x 1") from the 2" x 9" CA hinge strip. Trim the corners at a 45 deg. angle to make insertion easier.

HINGE THE ELEVATOR

❑ ❑ 2. Test fit the elevators to the stabilizer with all of the hinges and the wire joiner in place. Make sure the elevators are both set at the same angle. Make adjustments if necessary.

❑ ❑ 3. Work a generous amount of 30-minute epoxy into the wire joiner holes in the elevators.

❑ ❑ 4. Work the elevator hinges into the stab and, as you do this, insert the wire joiner all the way. Wipe away any excess epoxy. Glue the hinges in place using 4-6 drops of thin CA on **both sides of each hinge.**

HINGE THE AILERONS AND RUDDER

❑ 5. Pack 30 minute epoxy into the tail wheel hole in the rudder, then install the Rudder in the same manner as the Elevators.

❑ ❑ 6. Hinge the Ailerons using the same technique as the Elevators.

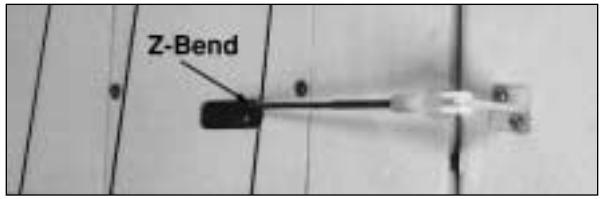
❑ ❑ 7. **Flap hinge** installation is covered in the Flap Fitting section on page 41.

THERE SHOULD BE NO HINGE GAP

FINAL CONTROL HARDWARE HOOKUP

❑ ❑ 1. Epoxy the 5/16" x 3/4" x 7/8" hardwood **Flap Servo Mounting Blocks** to the die-cut 1/16" ply **Flap Servo Hatches.** Install the flap servos as shown in the photo and on the plans. Fish the servo wires through to the opening at the center of the wing, then plug them into a "Y" cord. Before permanently screwing the servo hatches in position, hook up your radio and set the flap servos' throws.

❑ ❑ 2. Install the flap and aileron horns in line with the pushrod exits as shown on the plans. Drill 1/16" holes into the control surfaces at the proper horn locations, then soak the holes with CA glue. Screw the horns in place with #2 x 3/8" **Sheet Metal Screws.**



❑ ❑ 3. Hook up and adjust the aileron and flap linkages. Two .074 x 4" **Threaded End Rods** and **Nylon Clevises** are supplied to make the flap pushrods. The flap pushrods may be connected to the servos using Z-bends, or solder-on clevises (not included.) Refer to the **Control Surface Throws** section for movement recommendations.

❑ 4. The **Rudder** is connected using a **Small Control Horn** (cut down to two holes) and a **Nylon Clevis.** Refer to the plans for the proper location. Mark the location of the horn and drill two 1/16" pilot holes part way through the rudder. Thoroughly soak the holes with CA. Put a drop of CA on the back of the horn and screw the horn onto the rudder with two #2 x 3/8" **Sheet Metal Screws.**

❑ 5. The **retract** air valve, tank, and servo installation can be seen in the photos above and below. *We found that a micro (Futaba #133) servo worked well for actuating the air valve.* The tank fits in the built-in cradle in formers F-5 and F-6. It can be secured with two #2 x 3/8" screws and a rubber band (not supplied) or silicone glue.

❑ ❑ 6. Solder-on threaded couplers and nylon clevises are recommended for internal **elevator** and **rudder servo** hookups. Refer to the photos and plans for proper servo and horn orientation.

❑ 7. The **aileron** servo hookup can be seen in the above photo. The aileron servo is fitted with a 2-56 **Threaded Ball Link** connector that points downward toward the dual aileron connector.

❑ 8. Due to the variety of engine configurations and each modeler's *preferred* method, no **throttle** hookup materials are included with this kit. Our 2-stroke and 4-stroke prototypes were hooked up using 2-56 Threaded Ball Link connectors (#GPMQ3850) at the throttle and servo, and a Great Planes Accu-Glide Nylon Pushrod (#GPMQ3710).

RETRACTS

❑ ❑ 1. Hook up the air lines to the retracts and route them to the center of the wing. **Hint:** *For a more scale retract speed, insert air restrictors in the four lines that connect to the retracts. Position the restrictors at the retract end of the line.*

❑ ❑ 2. Screw in the retracts, hook them up, and test their operation.

COCKPIT FINISHING

(Basic cockpit)

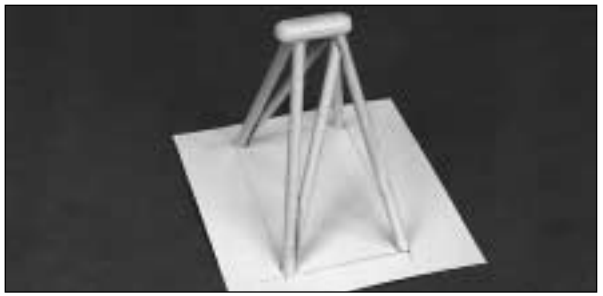
❑ 1. Sand the inside of the cockpit with 320 grit sandpaper. True up any uneven edges in the cockpit area.

❑ 2. Assemble and paint your pilots. Our Williams Brothers scale pilots required a 1/2" block under them to adjust their height. *We also modified the pilots to have ear phones and life jackets.* Test fit the pilots into the model.

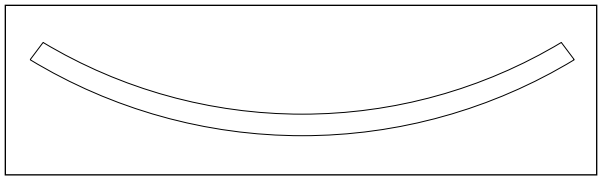
❑ 3. Paint the interior of the cockpit. An alternative to paint is to cover the inside of the cockpit with a fine grit black sandpaper for a textured finish. If you use the sandpaper technique, it is still advisable to first paint the cockpit corners black

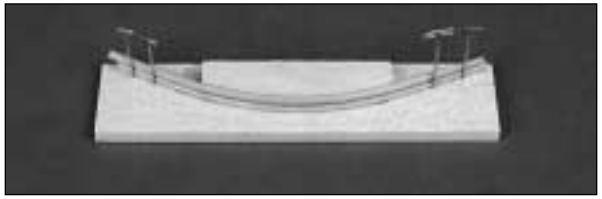
❑ 4. Locate the die-cut rear instrument panel parts. Refer to the photo above, then CA the two sides to the ply instrument panel. Sand the top edges flush. Glue on the top with the **wide end** pointing toward the **front of the fuse.** Paint the entire assembly black, or finish the outside with fine black sandpaper like the cockpit floor.

❑ 5. Install the **Instrument Panel Decals.** They may be applied directly to the existing panel. **Hint:** For best results, stick the decal to a scrap piece of 1/64" to 1/16" plywood, trim it to shape, then glue it in place.



❑ 6. The **Roll Cage** is made from two 3/16" x 12" **dowels** and a scrap of 3/8" x 1/4" x 1-1/14" balsa. Draw a 2" x 3-1/2" rectangle on a piece of cardstock. Round off the edges of the balsa top piece. Cut four legs from the dowels, 3-3/4" long. Hold two of the legs to form an inverted "V" with the bottom ends at the **wide** corners of the rectangle. Using the old **eyeball** method, sand angles on the bottom ends to sit flush with the cardstock. Sand angles at the top ends to blend with the top piece. Glue the legs to the card stock and also to the top piece. Repeat for the other two legs. Cut and fit two diagonal braces that run from the bottom forward leg to the top aft leg. Glue them in place. Fill any gaps with balsa filler, then sand the assembly smooth. Prime, then paint the assembly black. Remove it from the cardstock before gluing it to the cockpit floor.





❑ 7. Seat backs can be made using 1/8" dowel (not included) and card stock (file folder or index card). Make a **bending jig** from scrap 1/4 balsa, using the pattern shown above to set the radius. Cut and bend two 1/8" x 3" lengths of the dowel to form the top rail. **Hint:** *Start with dowels that are **6"** long. Soak the dowels with water, then bend and pin the dowels around the bending jig, one on top of the other. Allow the dowels to dry, then trim them to 3".*

❑ 8. Cut and glue 1" lengths of dowel to form the uprights. Lay the frame on the cardstock, then trace the inside shape. Cut and glue the card in between the dowels. Paint olive drab or tan.

❑ 9. Glue the pilots, instrument panel, roll cage, seat backs, etc., in position. **Hint:** *In addition to gluing, you may also screw the pilots in position from the underside of the cockpit floor for added insurance.* Add any other cockpit details of your choosing at this time.

❑ 10. Glue the canopy to the model. We recommend using RC-56 glue or 5-minute Epoxy to glue on the canopy, but if you have a favorite technique, use it. You should remove a small strip of MonoKote (if applicable) from under the frame for good glue adhesion. Use masking tape to hold the canopy in place while the glue sets.

STATIC PROP

We made a static prop by trimming and sanding a Top Flite 15 x 8 wooden prop to the shape shown in the photo. Use your modeling skills, a little imagination, and some epoxy, together with the materials shown in the photo to arrive at a nifty Static Prop. Remember, this prop, is only for looks, **NOT for use on a running engine!**

INSTALL RECEIVER, SWITCH AND BATTERY

❑ 1. Wrap your receiver and battery in plastic bags, then wrap with foam rubber.

❑ 2. Install the **battery** and **receiver** in the fuselage. **NOTE:** On our prototypes, we installed the receiver and battery between formers F-2 and F-3, above the fuel tank. Should the need arise, you can move the battery location to balance the aircraft.

❑ 3. Route the receiver **antenna** in one of the following ways:

a. Route the antenna along the inside of the fuselage side and out of the fuselage top, just behind the canopy. Anchor the antenna to the top of the fin with a rubber band.

b. Insert the antenna into a "pushrod guide tube" (not included) and tape it securely at the aft end. Install the tube and antenna into the aft portion of the fuselage through the lightening holes in the fuselage formers. The entire length of the antenna should be extended relatively straight.

CONTROL SURFACE THROWS

We recommend the following control surface throws:

NOTE: Throws are measured at the **widest part** of the elevators, rudder, and ailerons.

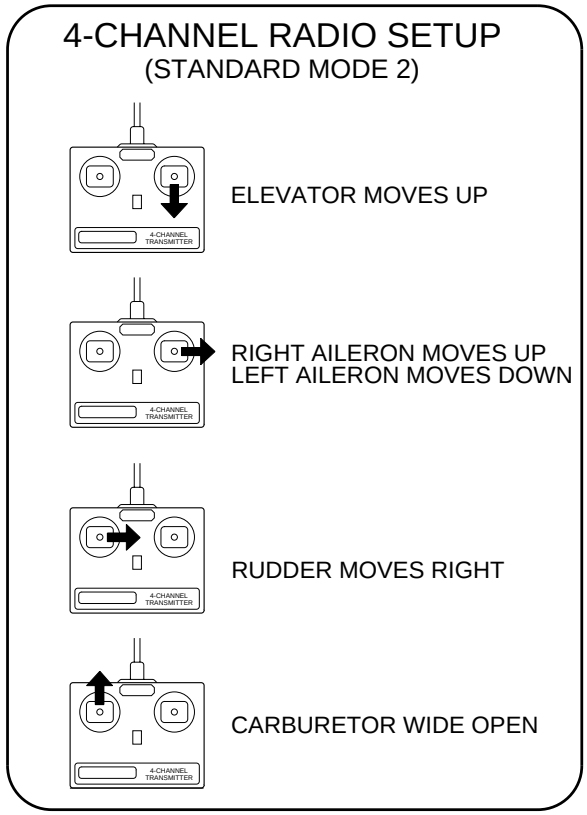
ELEVATOR:	(High Rate)	7/8" up 7/8" down
	(Low Rate)	5/8" up 5/8" down
RUDDER:	(High Rate)	1-5/8" right 1-5/8" left
	(Low Rate)	1-3/8" right 1-3/8" left
AILERONS:	(High Rate)	3/4" up 3/4" down
	(Low Rate)	1/2" up 1/2" down
FLAPS:	(Half Down - Takeoff) 3/4" Down (Full Down - Landing) 1-1/2" Down	

NOTE: If your radio does not have "dual rates," then set up the control surfaces to move at the **high rate** throws.

NOTE: The balance and surface throws for this aircraft have been extensively tested. We are confident that they represent the settings at which the AT-6 flies best. Please set up your aircraft to the specifications listed above. If, after a few flights, you would like to adjust the throws to suit your tastes, that is fine. Most warbirds such as the AT-6 have large elevators and do not require much throw. Too much throw can force the plane into a stall, so remember... "More is not better."

FINAL HOOKUPS AND CHECKS

❑ 1. Make sure the control surfaces move in the proper direction as illustrated in the following sketches:

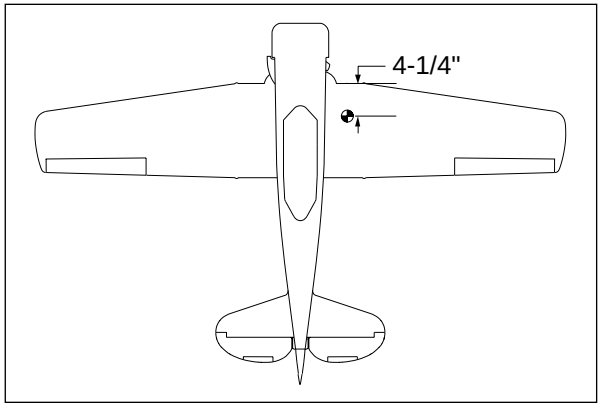


❑ 2. Adjust your pushrod hookups as necessary to provide the proper control surface movements as listed on Page 47.

BALANCE YOUR MODEL

NOTE: This section is VERY important and must NOT be omitted! A model that is not properly balanced will be unstable and possibly unflyable.

Make CG 4-1/4" behind BALSA leading edge. NOT the wheel Fairing.



❑ 1. Accurately mark the balance point on the top of the wing on both sides of the fuselage. The balance point is shown on the plan (CG), and is located 4-1/4 inches back from the leading edge at the location of rib #4 as shown in the sketch and on the plans. Hint: Use the full-size wing plan to help you accurately locate the proper balance point on the wing. This is the balance point at which your model should balance for your first flights. Later, you may wish to experiment by shifting the balance up to 1/4" forward or back to change the flying characteristics. Moving the balance forward may improve the smoothness and arrow-like tracking, but it may then require more speed for takeoff and make it more difficult to slow down for landing. Moving the balance aft makes the model more agile with a lighter and snappier "feel" and often improves knife-edge capabilities. In any case, please start at the location we recommend and do not at any time balance your model outside the recommended range.

❑ 2. With the wing attached to the fuselage, all parts of the model installed (ready to fly), an empty fuel tank, and the landing gear down (extended), hold the model upside down with the stabilizer level.

❑ 3. Lift the model at the balance point. If the tail drops when you lift, the model is "tail heavy" and you must add weight* to the nose to balance. If the nose drops, it is "nose heavy" and you must add weight* to the tail to balance. **NOTE:** Nose weight may be easily installed by using a Heavy Spinner Hub or gluing lead weights into the engine compartment. Tail weight may be added by using Great Planes (GPMQ4485) "stick-on" lead weights, and, later, if the balance proves to be OK you can open the fuse bottom and glue these in permanently.

*If possible, first attempt to balance the model by changing the position of the receiver battery and receiver. If you are unable to obtain good balance by doing so, **then** it will be necessary to add weight to the nose or tail to achieve the proper balance point.

PRE-FLIGHT

CHARGE THE BATTERIES

Follow the battery charging procedures in your radio instruction manual. You should **always** charge your transmitter and receiver batteries the night before you go flying, and at other times as recommended by the radio manufacturer.

FIND A SAFE PLACE TO FLY

1. The best place to fly your R/C model is an AMA (Academy of Model Aeronautics) chartered club field. Ask your hobby shop dealer if there is such a club in your area and join. Club fields are set up for R/C flying and that makes your outing safer and more enjoyable. The AMA also can tell you the name of a club in your area. We recommend that you join AMA and a local club so you can have a safe place to fly and have insurance to cover you in case of a flying accident. (The AMA address is listed on page 3 of this instruction book).

If a club and its flying site are not available, you need to find a large, grassy area at least 6 miles away from any other R/C radio operation like R/C boats and R/C cars and away from houses, buildings and streets. A schoolyard may look inviting, but it is too close to people, power lines and possible radio interference.

GROUND CHECK THE MODEL

If you are not thoroughly familiar with the operation of R/C models, ask an experienced modeler to check to see that you have the radio installed correctly and that all the control surfaces do what they are supposed to. The engine operation also must be checked and the engine "broken-in" on the ground by running the engine for at least two tanks of fuel. **Follow the engine manufacturer's recommendations for break-in.** Check to make sure all screws remain tight, that the hinges are secure and that the prop is on tight.

RANGE CHECK YOUR RADIO

Wherever you do fly, you need to check the operation of the radio before every time you fly. This means with the transmitter antenna collapsed and the receiver and transmitter on, you should be able to walk at least 100 feet away from the model and still have control. Have someone help you. Have them stand by your model and, while you work the controls, tell you what the various control surfaces are doing.

Repeat this test **with the engine running** at various speeds with an assistant holding the model. If the control surfaces are not always acting correctly, **do not fly!** Find and correct the problem first.

ENGINE SAFETY PRECAUTIONS

NOTE: Failure to follow these safety precautions may result in severe injury to yourself and others.

Keep all engine fuel in a safe place, away from high heat, sparks or flames, as fuel is very flammable. Do not smoke near the engine or fuel, and remember that the engine exhaust gives off a great deal of deadly carbon monoxide. Therefore **do not run the engine in a closed room or garage.**

Get help from an experienced pilot when learning to operate engines.

Use safety glasses when starting or running engines.

Do not run the engine in an area of loose gravel or sand, as the propeller may throw such material in your face or eyes.

Keep your face and body as well as all spectators away from the plane of rotation of the propeller as you start and run the engine.

Keep items such as these away from the prop: loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects (pencils, screw drivers) that may fall out of shirt or jacket pockets into the prop.

Use a "chicken stick" device or electric starter; follow instructions supplied with the starter or stick. Make certain the glow plug clip or connector is secure so that it will not pop off or otherwise get into the running propeller.

Make all engine adjustments from **behind** the rotating propeller.

The engine gets hot! Do not touch it during or after operation. Make sure fuel lines are in good condition so fuel will not leak onto a hot engine, causing a fire.

To stop the engine, cut off the fuel supply by closing off the fuel line or following the engine manufacturer's recommendations. Do not use hands, fingers or any body part to try to stop the engine. Do not throw anything into the prop of a running engine.

AMA SAFETY CODE

Read and abide by the following Academy of Model Aeronautics Official Safety Code:

GENERAL

1. I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been previously successfully flight tested.

2. I will not fly my model aircraft higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right of way to, and avoid flying in the proximity of, full scale aircraft. Where necessary an observer shall be used to supervise flying to avoid having models fly in the proximity of full scale aircraft.

3. Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.

7. I will not fly my model unless it is identified with my name and address or AMA number, on or in the model.

9. I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind).

RADIO CONTROL

1. I will have completed a successful radio equipment ground check before the first flight of a new or repaired model.

2. I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.

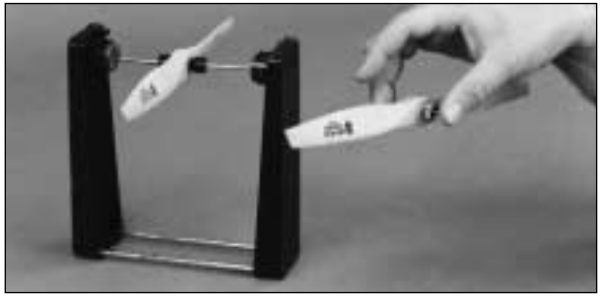
3. I will perform my initial turn after takeoff away from the pit or spectator areas, and I will not thereafter fly over pit or spectator areas, unless beyond my control.

4. I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission...

FLYING

The Top Flite AT-6 Texan is a great flying sport scale airplane that flies smoothly and predictably, yet is highly maneuverable. Compared to other warbirds, its flight characteristics are quite docile and forgiving. It does not, however, have the self-recovery characteristics of a primary R/C trainer; therefore, you must either have mastered the basics of R/C flying or obtained the assistance of a competent R/C pilot to help you with your first flights.

BALANCE THE PROPELLER: Balance your propellers carefully before flying. An unbalanced prop is the single most significant cause of damaging vibration. Not only will engine mounting screws and bolts vibrate out, possibly with disastrous effect, but vibration will also damage your radio receiver and battery. Vibration will cause your fuel to foam, which will, in turn, cause your engine to run rough or quit.



We use a Top Flite Precision Magnetic Prop Balancer (#TOPQ5700) in the workshop and keep a Great Planes Fingertip Balancer (#GPMQ5000) in our flight box.

TAKEOFF: If you have dual rates on your transmitter, set the switches to "high rate" for takeoff, especially when taking off in a crosswind. Although this model has good low speed characteristics, you should always build up as much speed as your runway will permit before lifting off, as this will give you a safety margin in case of a "flame-out." When you first advance the throttle and the tail begins to lift, the plane will start to turn left (a characteristic of all "tail draggers"). Be ready for this, and correct by applying sufficient right rudder to hold it straight down the runway. The left-turning tendency will go away as soon as the tail is up and the plane picks up speed. Be **sure** to allow

the tail to come up. Depending on the surface you are flying from, you will need to apply very little to no up elevator until flying speed is obtained. Don't hold the tail on the ground with too much up elevator, as the Texan will become airborne prematurely and will possibly stall. When the plane has sufficient flying speed, lift off by smoothly applying up elevator (don't "jerk" it off to a steep climb!), and climb out gradually. Do not use flaps for your initial takeoff. After you have the feel of the Texan, takeoffs may be made with the flaps set at 50%.

1.20 4-STROKE

NOTE: If you have installed a 1.20 4-stroke engine, throttle management on takeoff and throughout the flight is a must! Your first few flights should be made using slightly more than half throttle for takeoff. Allow the tail to come up, then lift off when sufficient speed has been obtained. **Apply power gradually until you become familiar with the Texans flight characteristics. Avoid "Power Diving" when using a 1.20 engine.**

FLYING: We recommend that you take it easy with your Texan for the first several flights, gradually "getting acquainted" with this realistic warbird as your engine gets fully broken-in. Add and practice one maneuver at a time, learning how she behaves in each. For ultra-smooth flying and normal maneuvers, we recommend using the "low rate" settings as listed on page 47. "High rate" elevator may be required for crisp snap rolls and spins. "High rate" rudder is best for knife edge. **Speed** is the key to good knife-edge performance. With a 1.20 engine installed, the Texan really scoots along, so good throttle management should be used when performing high "G" diving maneuvers such as split-S and loops.

CAUTION (THIS APPLIES TO ***ALL*** R/C AIRPLANES): If, while flying, you notice any unusual sounds, such as a low-pitched "buzz," this may be an indication of control surface "flutter." Because flutter can quickly destroy components of your airplane, any time you detect flutter you must immediately cut the throttle and land the airplane! Check all servo grommets for deterioration (this will indicate which surface fluttered), and make sure all pushrod linkages are slop-free. If it fluttered once, it probably will flutter again under similar circumstances unless you can eliminate the slop or flexing in the linkages. Here are some things which can result in flutter: excessive hinge gap; not mounting control horns solidly; sloppy fit of clevis pin in horn; elasticity present in flexible plastic pushrods; side-play of pushrod in guide tube caused by tight bends; sloppy fit of Z-bend in servo arm; insufficient glue used when gluing in the elevator joiner wire or aileron torque rod; excessive flexing of aileron, caused by using too soft balsa aileron; excessive "play" or "backlash" in servo gears; and insecure servo mounting.

LANDING: When it's time to land, fly a normal landing pattern and approach. The Texan will probably bleed off airspeed more rapidly than the sport planes you are used to. For this reason, keep a few clicks of power on until you are over the runway threshold. For your first landings, plan to land slightly faster than stall speed and on the main wheels, as this is the easiest way to land your AT-6. Later, with a little technique, you will find you can make slow, 3-point landings.

Full flaps make the Texan very steady in the landing pattern, but just carry a little extra power to make up for the extra drag. The extra drag of the flaps also allows you to make shorter, steeper approaches. Touch and go's and go-arounds can be accomplished with full flaps, but be ready to use a little more up elevator so have your "high rates" on. It is preferred to have the flaps up or at half setting for takeoffs and climb-outs because the plane will accelerate and climb much better.

Have a ball! But always stay in control and fly in a safe manner.

If you enjoyed building the Top Flite AT-6 Texan, try one of these other outstanding .60 size Gold Edition kits as your next project.

(TOPA0120) Top Flite P-40E Warhawk
64" Wingspan, 8 - 10.5 lb.

(TOPA0110) Top Flite P-51D Mustang
65" Wingspan, 8 - 10 lb.

(TOPA0100) Top Flite F4U Corsair
62" Wingspan, 7 - 9.5 lb.

TWO-VIEW DRAWING

Use this layout for trim scheme planning only. Not suitable for scale documentation.