# T-34B MENTOR

GOLD EDITION™


MADE IN USA

**Wingspan:** 80 in [2032 mm]
**Wing Area:** 1025 sq in [66.1 sq dm]
**Weight:** 10 to 14 lb [4536 – 6350 g]
**Wing Loading:** 22.5 to 31.5 oz/sq ft [68.7 – 96.1 g/sq dm]
**Fuselage Length:** 62.8 in [1595 mm]

**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 buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to immediately return this kit in new and unused condition to the place of purchase.**

**Top Flite Models P.O. Box 788 Urbana, Il 61803** **Technical Assistance Call (217)398-8970 productsupport@top-flite.com**

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

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## PROTECT YOUR MODEL, YOURSELF & OTHERS FOLLOW THESE IMPORTANT SAFETY PRECAUTIONS

Your Beechcraft T-34B Mentor is not a toy, but a sophisticated working model that functions very much like an actual airplane. Because of its realistic performance, if you do not assemble and operate your T-34B Mentor correctly, you could possibly injure yourself or spectators and damage property.

**To make your R/C modeling experience totally enjoyable, get assistance with assembly and your first flights from an experienced, knowledgeable modeler.** 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 Academy of Model Aeronautics (AMA), which has more than 2,600 chartered clubs across the United States. We recommend you join the AMA which will insure you at AMA club sites and events. AMA Membership is required at chartered club fields where qualified flight instructors 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**
**(800) 435-9262**
**Fax (765) 741-0057**
or via the Internet at: http://www.modelaircraft.org

# INTRODUCTION

Congratulations and thank you for purchasing the **Top Flite Gold Edition Beechcraft T-34B Mentor**.

Since this is a scale model with lots of detail, you'll find it takes longer to complete than the sport models you've built before. But since this is a Top Flite Gold Edition kit, it isn't more difficult to build than those sport models. The Top Flite T-34B Mentor uses the same materials and standard construction techniques you've already become accustomed to. You won't have to learn anything new to end up with a first class scale model! Not only that, nearly all of the trim schemes you'll find on full size T-34B Mentors are quite simple and should be easy to duplicate with Top Flite MonoKote film! The Top Flite Beechcraft T-34B Mentor is an excellent Sportsman or Expert Scale subject. Its large size and accurate scale outline afford you the opportunity to go all out with as many extra details as you like. And with the abundance of T-34B Mentors at airports around the country, finding a full-scale plane to model shouldn't be a problem.

Anyone who has mastered a low wing sport model should be able to fly the T-34B Mentor without difficulty. It handles very much like a full size T-34B Mentor–smooth and predictable.

Because of its 80" wingspan, the Top Flite Beechcraft T-34B Mentor is eligible for IMAA* events. In order to be IMAA legal some of the control components and hardware may need to be replaced to conform to Giant Scale rules even though this model does not require heavy-duty hookups.

Several scale accessories specially designed for the Top Flite T-34B Mentor are available separately including a full cockpit interior, in-cowl exhaust system, and a complete lighting kit. See the Scale Accessories section on page 5 for more information.

*IMAA (International Miniature Aircraft Association) is an organization that promotes non-competitive flying of giant scale models.

International Miniature Aircraft Association
205 S. Hilldale Road
Salina, KS 67401
(913) 832 - 5569
www.fly-imaa.org/imaa/sanction.html

**NOTE:** We, as the kit manufacturer, 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.

**Please inspect all parts carefully before you start 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 or e-mail us at: productsupport@top-flite.com.**

**We'll be glad to help. If you are calling for replacement parts, please look up the part numbers and have them ready when you call.**

# 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 every 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 them if they show signs of wear.

6. If you are not already an experienced R/C pilot, you must **fly** the model **only with the help** of a competent, experienced R/C pilot.

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

# DECISIONS YOU MUST MAKE

## ENGINE SELECTION

**Recommended engine size:**

.60 to .91 cu. in. [9.8 to 14.9 cc] **2-stroke**
.90 to 1.20 cu. in. [14.7 to 19.7 cc] **4-stroke**

Your Top Flite Gold Edition T-34B Mentor will perform **well** with any of the engines within the recommended range. The 4-stroke engines and most .90 [14.7 cc] 2-stroke engines will turn a larger prop at lower RPM. This is often desirable for scale realism. Many .60 [9.8 cc] 2-stroke engines produce about as much horsepower as the popular .75 [12.3 cc] engines and will fly the T-34B Mentor well. If you use a .60 [9.8 cc] 2-stroke, a ball bearing, Schnuerle-ported engine is highly recommended. Some newer .70 [11.5 cc] 4-stroke engines also produce enough power as well.

Our prototype T-34B Mentor weighed 13 pounds [5900 g] with all of the options, including flaps and scale cockpit interior. It was flown with the SuperTigre® G-75, that turned a Top Flite Power Point® 12 x 8 prop at 9,600 RPM. **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 included Great Planes® Adjustable Engine Mount will hold a range of engines from .60 [9.8 cc] 2-stroke through 1.20 [19.7 cc] 4-stroke.

## EXHAUST SYSTEM

A Top Flite header and muffler are available for most of the popular 2-stroke engines that will fit inside your cowl. They are designed for 2-stroke engines mounted horizontally, as used on the model and shown in the instructions. For part numbers see the accessory list on page 6.

This muffler system is not recommended for engines larger than .75 [12.3 cc] as it may cause the engine to overheat.

## RETRACTABLE LANDING GEAR

You may build your T-34B Mentor either with fixed or retractable landing gear. Fixed gear is easier to install and all the hardware you need for fixed gear is supplied with this kit. We also provide detailed instructions on how to install retractable landing gear available from Robart. We chose the Robart 630BNZ retracts which were specifically designed for this model. This landing gear is an adaptation of the Robart #640 mains and the #631 nose gear. Other systems may work as well but it is up to you to make modifications to fit them into the model.

**For Retractable Landing Gear you will need these items (not included):**

- ❏ Robart 630BNZ Retracts (ROBQ1620)
- ❏ Standard Air Kit (ROBQ2302)
- ❏ Standard or mini servo
- ❏ Extra Pressure Tubing (ROBQ2369)
- ❏ Tubing Connectors (ROBQ2395)
- ❏ 2-56 Pull-Pull cable system (DUBQ1417)
- ❏ (2) Screw-Lock Connectors (GPMQ3870)
- ❏ (2) 2-56 Ball Link set (GPMQ3840)
- ❏ (2) 1/4" Wheel Collars (DUBQ1200)
- ❏ (1) Nylon Clevis and Pushrod (GPMQ3770)
- ❏ (8) #4 x 3/8" [9.5mm] flat head sheet metal screws

## FLAPS

Your T-34B Mentor is designed to incorporate scale flaps; however, **flaps are optional** and **not necessary** for an excellent flying experience. Without flaps, the takeoff roll is longer and the landing speed is faster.

The flaps are not difficult to build, but they do require good craftsmanship to fit well. Flaps add nicely to the model's flight characteristics and scale appearance while causing no bad effects. Only slight trim correction is needed when they are used with the recommended throws. They are a highly recommended *fun option* for those who wish to install them. More information on the use of the flaps may be found in the "flying" section.

**For Flaps, you will need the following additional items:**

- ❏ (2) Standard servos.
- ❏ Servo "Y" Harness
- ❏ Robart #309 Super Hinge Points (ROBQ2509)

### Scale cockpit interior

Your model won't be complete without the Top Flite Beechcraft T-34B Mentor Scale Cockpit Interior (TOPQ8413). It includes the floor, side panels, instrument panels and seats! You can install the Cockpit Interior at any time because the canopy is removable but it's easiest to build the cockpit into the model while it's under construction. The servos and pushrods are located so the Cockpit Interior can be installed without any modification.

The canopy has been designed so that it can be cut apart and made into a sliding canopy if you wish.

## NOTES FOR COMPETITION MINDED MODELERS

We designed our model from documentation obtained from Bob's Aircraft Documentation and from measurements taken from a T34B at a local airport. The model scale is 1:5.

If you plan to enter your T-34B Mentor in scale competition (it's lots of fun, and the runways are almost always paved!), this kit qualifies for Fun Scale and the Sportsman and Expert classes in Sport Scale. Fun Scale and Sport Scale have the same flight requirements where you must perform ten maneuvers of which five are mandatory. If you have never competed in a scale contest, you could start out in Fun Scale. In Fun Scale, the only documentation you need for static judging is any proof that a full size aircraft of this type, in the paint/markings scheme on your model, did exist. A single photo, kit box cover, even a painting is sufficient proof! If you're interested, contact the AMA for a rulebook which will tell you everything you need to know. Look in the back of the AMA magazine, Model Aviation, for a schedule of events.

The trim scheme of the T-34B Mentor on the kit box is from a T-34B Mentor owned by Rudy Frasca. If you are going to compete in scale competition, use the photos in your documentation package as a guide for your trim scheme.

## DOCUMENTATION

Three view drawings and photo packs of full size Beechcraft T-34B Mentors are available from:

**Bob's Aircraft Documentation**
3114 Yukon Avenue
Costa Mesa, CA 92626
(714) 979-8058

## NOTES FROM THE DESIGNER

The Top Flite Beechcraft Bonanza was introduced several years ago. Since then many modelers have requested that we do the T-34B Mentor as well. The Mentor is a Bonanza, modified as a military trainer.

**Scale Accuracy:** The T-34B Mentor was designed using three view drawings for the Beechcraft Bonanza dated 1969 and from documentation obtained from Bob's Aircraft Documentation. In addition, measurements of all aircraft components were taken from an actual T-34B Mentor.

**Wing Design:** The Top Flite T-34B Mentor was designed with an "I-Beam" type of wing spar rather than the more traditional "D-Tube" type construction. Actually, the design could be called an "I-Tube". This simplifies construction and is approximately 50% stronger than D-Tube designs. The wing was designed with an absolute minimum number of seams that must be sanded on the finished wing. The result is a very smooth wing.

**Flaps:** Flaps on the full-scale aircraft allow steeper approaches and slower landing speeds. They do exactly the same on this model. The improvement in performance is well worth the effort.

**Landing Gear:** If you are installing fixed gear you will note that the strut extends out from the center of the grooved rail instead of the end. This allows landing stresses to be distributed across three ply reinforced ribs, rather than being concentrated at the end of the rail. The mounting rails are designed to minimize damage in the event of hard landings or contact with obstacles. If you plan to install retractable landing gear, we highly recommend the Robart units especially designed for the Bonanza. They are very robust and include shock-absorbing struts. Gear doors would look great on this model but you will have to do some modifications if you want to install then.

**Fuselage Design:** The fuselage design is fairly conventional. The T-34B Mentor differs from the Bonanza primarily in the tandem two place cockpit and the fin and rudder. The large canopy is supplied in two parts, which can be held in place with canopy glue and/or screws. The canopy has been designed so that it can be cut apart and made into a sliding canopy system. You will need to install rails for the canopy to slide on as well. For help in this area, there are several scale publications that have covered sliding canopy installations.

The cabin area is reinforced with 1/8" lite ply. If you are going to install the cockpit kit, you should reinforce the area with some basswood rails along the bottom of formers F2, F4 and F6 across the width of the fuselage. The cockpit kit requires that a portion of several formers be trimmed and the basswood rails are needed for reinforcement in those areas. We have included ample extra 1/4" x 3/8" basswood material for this purpose.

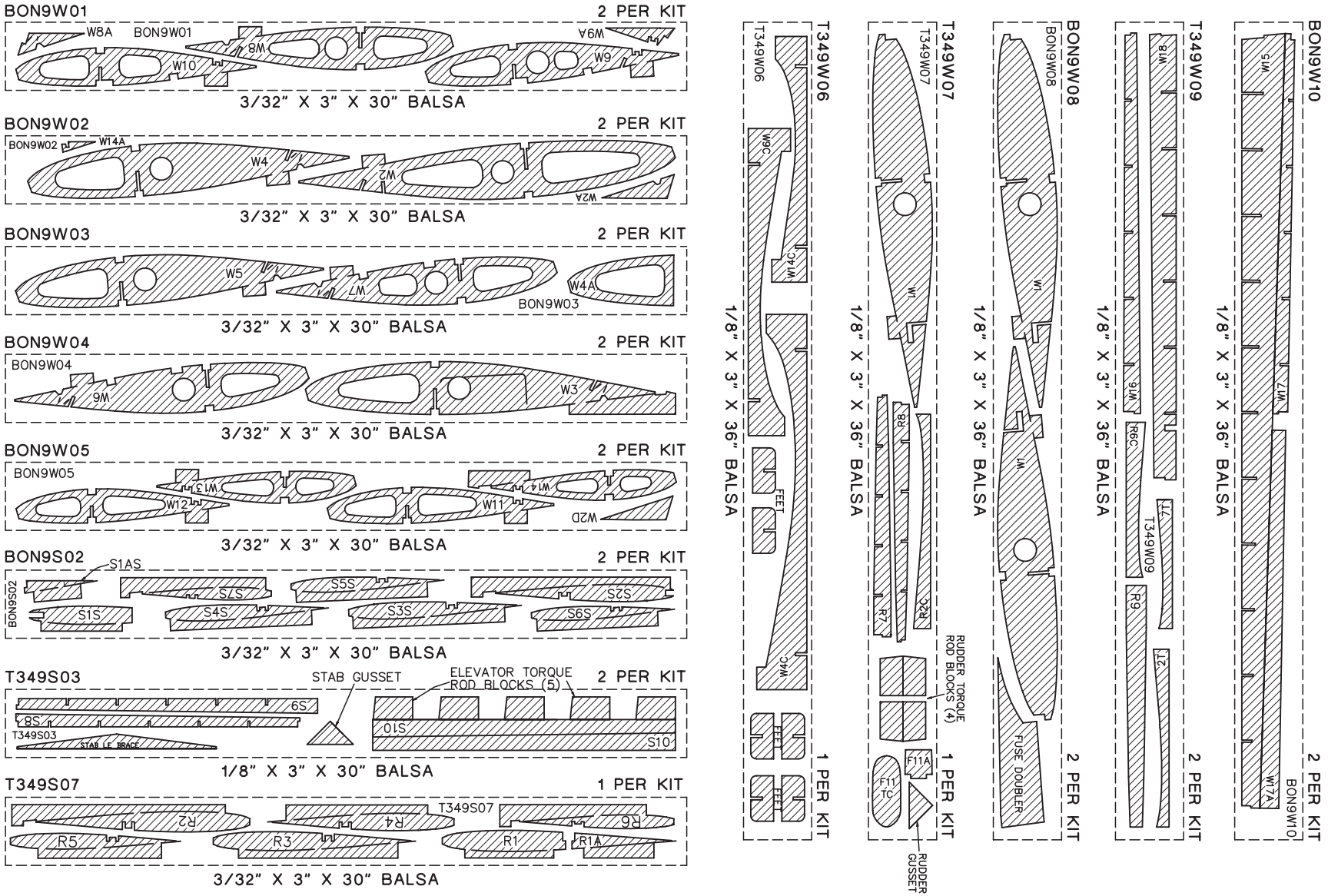
**Will It Really Fly On a .60 Size Engine?** YES!! And very scale like as well. Our test flying was done with a new O. S. .61FX with a TF in-cowl muffler. It was turning a TF 12-6 Power Point prop and we never felt a need for more power. It flew in a very scale like manner.

Good luck and good flying. I hope you enjoy building and flying your T-34B Mentor as much as we did designing it.

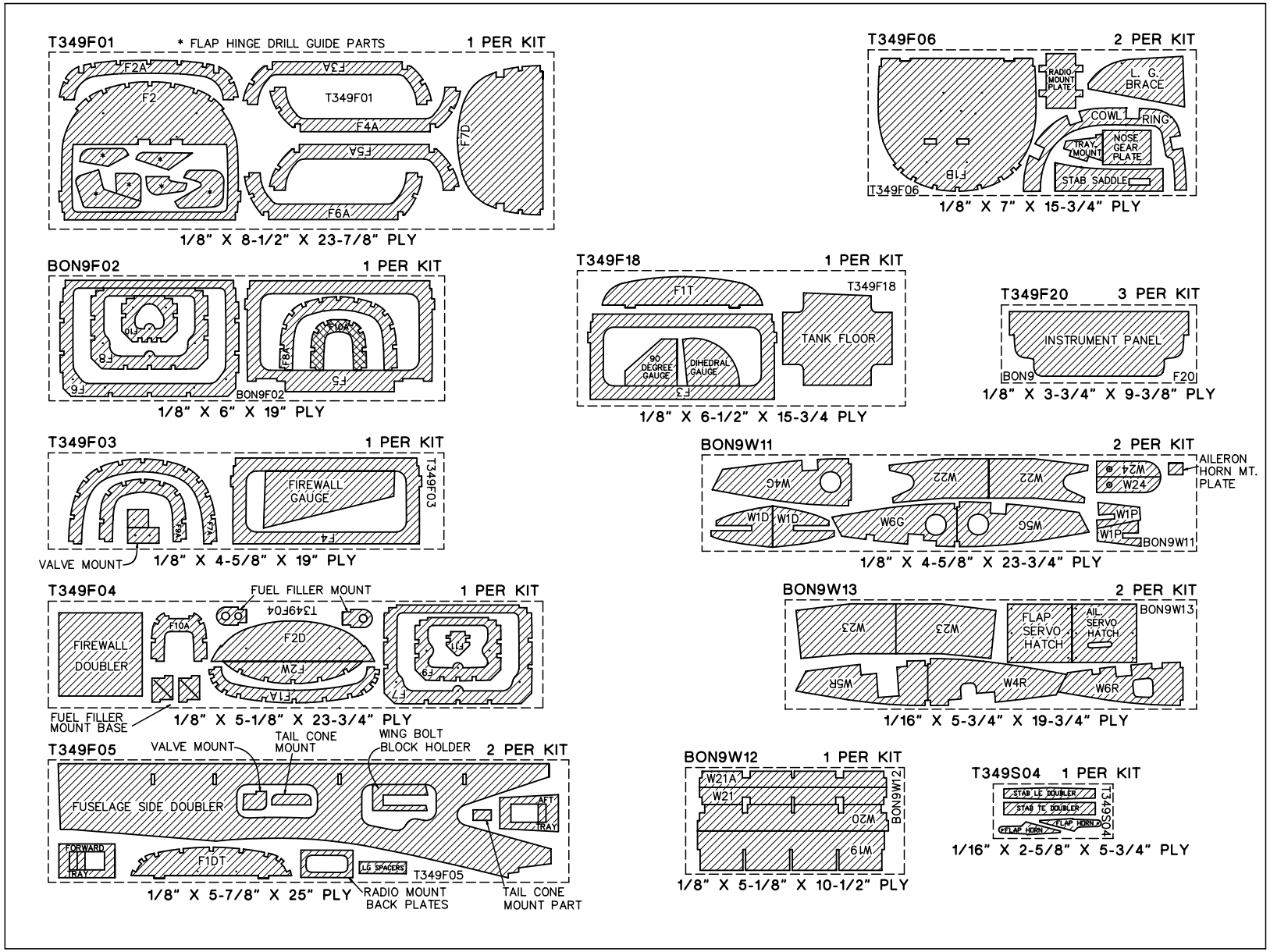
# DIE-CUT PATTERNS

**IMPORTANT**

Do not remove the wing ribs or other wing parts from the die-cut sheets until instructed to do so.



# DIE-CUT PATTERNS



# OTHER ITEMS REQUIRED

## Accessories

These are additional items you will need to complete your T-34B Mentor that are not included with your kit. Order numbers are in parentheses (GPMQ4130). Our exclusive brand is listed where possible: TOP is the Top Flite brand, GPM is the Great Planes brand, and HCA is the Hobbico® brand.

- ❏ 4- to 6-channel radio with 6 to 9 servos
- ❏ (2) 12" extension for ailerons
- ❏ (2) 6" extension for elevator and rudder servo
- ❏ (1) "Y" Harness for ailerons
- ❏ 3-1/2" Main Wheels (ROBQ1516)
- ❏ 2-3/4" Nose Wheel (ROBQ1513)
- ❏ 14 oz. Fuel Tank (GPMQ4106)
- ❏ 2-3/4" Aluminum Spinner (GPMQ4555)
- ❏ 36" Medium Silicone Fuel Tubing (GPMQ4131)
- ❏ 1/4" R/C Foam Rubber Padding (HCAQ1000)
- ❏ 1/5 Scale Pilot Figures. If using Williams Bro. use (WBRQ2625) - 1/4 scale fits best.
- ❏ Fuel Filler Valve (GPMQ4160)
- ❏ Exhaust Deflector (HCAP2175)
- ❏ 3-4 rolls Top Flite Super MonoKote covering, see Finishing on page 58
- ❏ Paint, see Finishing on page 59
- ❏ Propellers, see the engine instructions

**For an In Cowl Muffler setup, the following items will be required:**

O.S.® .61FX & FX Top Flite Header (TOPQ7920)
SuperTigre .75G Top Flite Header (TOPQ7926)
.61-.75 In Cowl Muffler (TOPQ7917)

**Note:** This muffler is NOT recommended for .90 or larger size engines.

## Building supplies

Here's a checklist of supplies you should have on hand while you're building. We recommend **Great Planes Pro**™ CA and Epoxy.

**Glue/Filler**

- ❏ 4 oz. Thin CA (GPMR6003)
- ❏ 4 oz. Medium CA+ (GPMR6009)
- ❏ 2 oz. Thick CA- (GPMR6015)
- ❏ CA Accelerator (GPMR6035)
- ❏ CA Debonder (GMPR6039)
- ❏ CA Applicator Tips (HCAR3780)
- ❏ 30-Minute Epoxy (GPMR6047)
- ❏ 6-Minute Epoxy (GPMR6045)
- ❏ Pro Wood Glue (GPMR6161)
- ❏ J & Z Products Z RC/56 canopy glue (JOZR5007)
- ❏ Microballoons (TOPR1090)
- ❏ Milled Fiberglass (GPMR6165)
- ❏ Lightweight Hobby Filler (HCAR3401)
- ❏ Auto Body Filler (Bondo® or similar)
- ❏ 3M #75 Spray Adhesive (MMMR1900)
- ❏ Denatured or Isopropyl Alcohol

**Tools**

- ❏ #11 Blades (HCAR0311, 100 qty.)
- ❏ Single Edge Razor Blades (HCAR0312, 100 qty.)
- ❏ Razor Plane (MASR1510)
- ❏ X-Acto® Building Square (XACR7726)
- ❏ X-Acto Building Triangle (XACR7725)
- ❏ T-Pins (HCAR5100 - Small, HCAR5150 - Medium, HCAR5200 - Large)
- ❏ 1/4-20 Tap and Drill Set (GPMR8105)
- ❏ 8-32 Tap and Drill Set (GPMR8103)
- ❏ Hobbico Curved Tip Canopy Scissors (HCAR0667)
- ❏ Long Handle 9/64" Ball Driver (GPMR8004)
- ❏ Long Handle 3/32" Ball Driver (GPMR8002)
- ❏ Silver Solder (GPMR8070 w/flux)
- ❏ Masking Tape (TOPR8018)
- ❏ Great Planes Plan Protector (GPMR6167) or waxed paper
- ❏ Great Planes Dead Center™ Tool (GPMR8130)
- ❏ Easy-Touch™ Bar Sanders*
- ❏ Heat Gun (TOPR2000)
- ❏ Trim Seal Tool (TOPR2200)
- ❏ Hot Sock™ (TOPR2175)
- ❏ Sealing Iron (TOPR2100)
- ❏ Drill Bits:
  1/16", 17/64", 3/32", 9/32", 1/8", 5/16", 5/32", 9/64" or #29, 3/16", 11/64" or #10, 1/4", 13/64" or #7

# EASY-TOUCH™ BAR SANDER

A flat, durable, easy to handle sanding tool is a necessity for building a well finished model. Great Planes makes a complete range of patented Easy-Touch Bar Sanders and replaceable Easy-Touch adhesive-backed sandpaper. While building the T-34B Mentor we used two 5-1/2" Bar Sanders and two 11" Bar Sanders equipped with 80-grit and 150-grit adhesive-backed sandpaper.

Here's the complete list of Easy-Touch Bar Sanders and adhesive backed sandpaper:

| | |
|---|---|
| 5-1/2" Bar Sander | (GPMR6169) |
| 11" Bar Sander | (GPMR6170) |
| 22" Bar Sander | (GPMR6172) |

12' roll of Adhesive-backed sandpaper

| | |
|---|---|
| 80-grit | (GPMR6180) |
| 150-grit | (GPMR6183) |
| 220-grit | (GPMR6185) |

Assortment pack of 5-1/2" strips (GPMR6189)

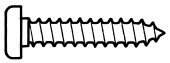
We also use 3M 320-grit or 400-grit wet-or-dry sandpaper for finish sanding.

## IMPORTANT BUILDING NOTES

**There are two types of screws used in this kit:**

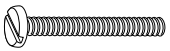
**Sheet metal screws** are designated by a number and a length.

For example #6 x 3/4" long [19.1mm]



**Machine screws** are designated by a number, threads per inch, and a length.

For example 4-40 x 3/4" long [19.1mm]



- When you see the term ***test fit*** in the instructions, it means that you should first position the part on the assembly **without using any glue**, then slightly modify or *custom fit* the part as necessary for the best fit.

- Whenever the term ***glue*** is written you should rely upon your experience to decide what type of glue to use. When a specific type of adhesive works best for that step, the instructions will tell you what glue is recommended.

- Whenever just ***epoxy*** is specified you may use ***either*** 30-minute epoxy ***or*** 6-minute epoxy. When 30-minute epoxy is **specified,** it is **highly recommended** that you use only 30-minute (or 45-minute) epoxy because you will need the working time and/or the additional strength.

- Occasionally we refer to the *top* or *bottom* of the model or *up* or *down*. To avoid confusion, the *top* or *bottom* of the model is as it would be when the airplane is right side up and will be referred to as the top even if the model is upside-down during that step, *i.e.* the top main spar is always the top main spar even if the wing is upside-down when you are working on it. Similarly, *move the former up* means move the former toward the top of the fuselage even if the fuselage is upside-down when you are working on it.

- **Incidence and Thrust Angles**: The incidence angles and down thrust angles shown on the fuselage side view are in reference to the stepped main fuselage stringer (the 1/4" x 3/8" x 36" stepped stringer), which is set at 0°. The right thrust shown on the bottom view is in reference to the centerline of the fuselage. Remember, this is the **bottom view** so right thrust is viewed as an offset to the left from the bottom.

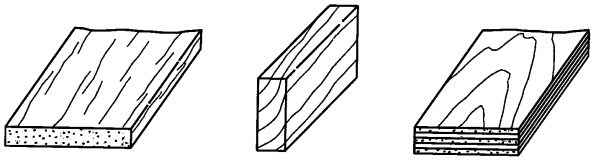
- When you get to each step, read that step **completely through to the end** before you begin. Frequently there is important information or a note at the end of the step that you need to know before you start.

- **Photos** and **sketches** are placed **before** the step they refer to. Frequently you can study photos in following steps to get another view of the same parts.

## COMMON ABBREVIATIONS

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

## TYPES OF WOOD

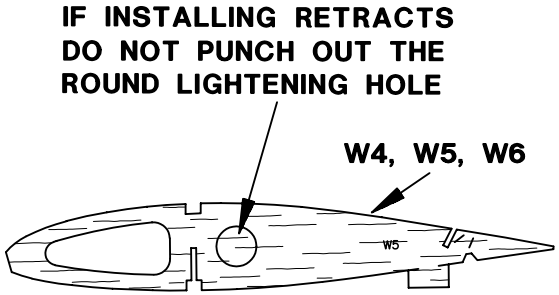


**BALSA** **BASSWOOD** **PLYWOOD**

## GET READY TO BUILD

1. Unroll the plan sheets. Roll them inside out so they lie flat.

2. Remove all the parts from the box. Use a ballpoint pen (not a felt tip pen) to lightly write the **name** or **size** on each piece so you can identify it later. Use the ***die-cut patterns*** on pages 6 and 7 to identify and mark the die-cut parts **before** you remove them from their die sheets. Many of the parts already have numbers stamped on them, but in some cases the number is located alongside the parts or only on the die drawings in the manual. Do not remove the die-cut parts until instructed to do so. If a part is difficult to remove, don't force it out but cut around it with a hobby knife and a #11 blade. After you remove the parts from their die sheets, lightly sand the edges to remove slivers or die-cutting irregularities. Save some of the larger leftover pieces of wood.




**Note:** If you are going to install retracts, don't punch out the round *lightening hole* in the die-cut 3/32" [2.4mm] balsa **wing ribs W4, W5 and W6**. Instead, apply thin CA around the lightening hole to glue it in place.

3. Separate the parts into groups such as **stab, fin, wing,** and **fuse.** Store smaller parts in zipper-top food storage bags.

# BUILD THE TAIL SURFACES

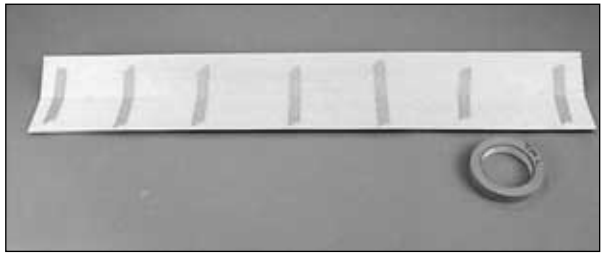
## *MAKE THE SKINS FOR THE TAIL SURFACES*

❏ 1. See the **Hot Tip** that follows and use six 1/16" x 3" x 30" [1.6 x 76 x 762mm] balsa sheets to make two 1/16" x 9" x 30" [1.6 x 229 x 762mm] **stab skin planks**. Make a third plank for the **fin/rudder skin** from three more 1/16" x 3" x 30" [1.6 x 76 x 762mm] balsa sheets.

HOT TIP

### HOW TO MAKE THE SKINS

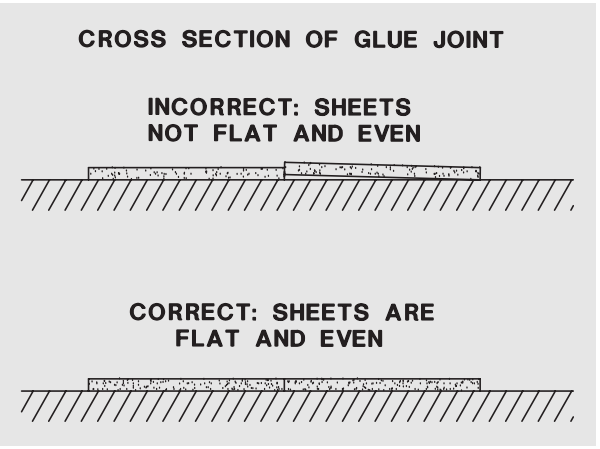
**A**. Use a straightedge and a sharp #11 blade to true the joining edges of the sheets. When you trim them, do not cut all the way through the first time but make several passes so you **slice** the wood instead of splitting it.



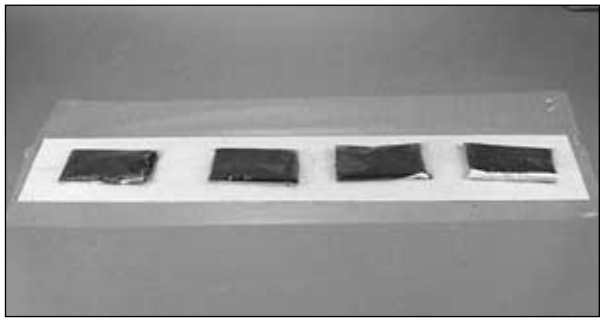
**B**. Tightly tape the sheets together with masking tape placed about every 4" along the seams. The sheets will not lay flat because they are tightly taped together

**C**. Place waxed paper on your workbench. Flip the sheets over and apply a bead of aliphatic resin (*wood workers glue* such as Great Planes Pro™) between the seams. Immediately proceed to the next step.

**D**. Use a credit card or a piece of thin plywood to simultaneously **press** the sheets flat as you squeegee the excess glue from the seam. Wipe the glue off your squeegee with a paper towel or a stick of wood. Immediately proceed to the next step.




**E**. Press the joining edges of the sheets down with your fingers so they are flat and even.

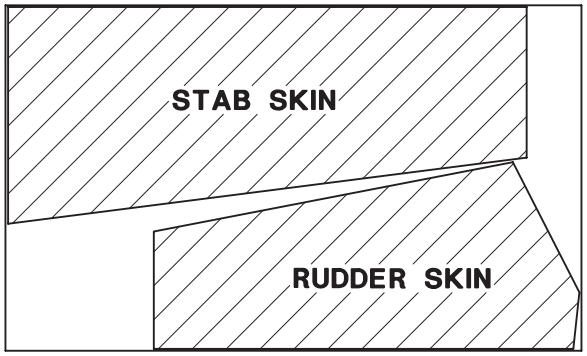


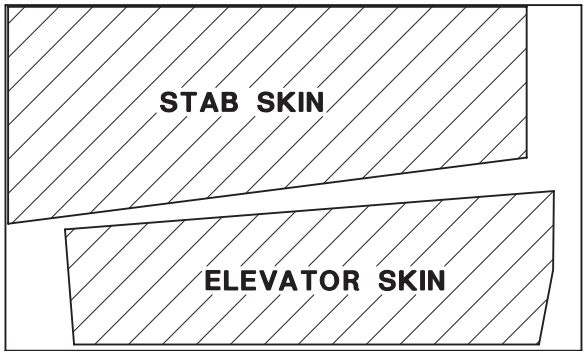
**F**. Place weights along the glue joint and let the glue dry.

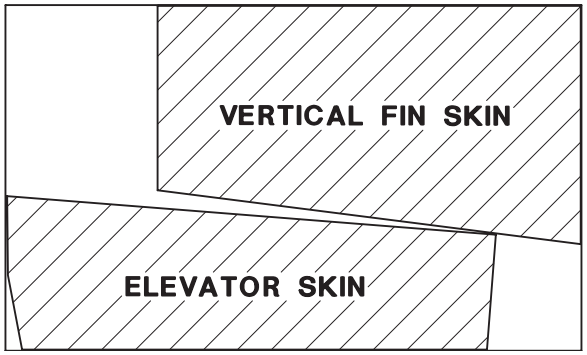
**G**. Use the same procedure to make the wing skins when you build the wing.

❏ 2. After the glue is dry, peel off the masking tape and decide which side of the planks will be the outside. Use a bar sander or a large, flat sanding block and 150-grit sandpaper to sand the outside of the planks so they are flat, even and smooth. The idea is to do the sanding ***before*** you glue the skins to the structure.

❏ 3. Cut the three 9" x 30" [229 x 762mm] sheets in half, making six 9" x 15" [229 x 381mm] planks.




❏ 4. Cut the **stab, elevator, vertical fin and rudder skin templates** from the plan. Use a straightedge and ballpoint pen to mark their outline onto the 9" x 15" [229 x 381mm] planks (do not use a felt-tip pen). The templates are slightly oversize to allow slight variances in construction. Note the **grain direction**. Follow this sequence:

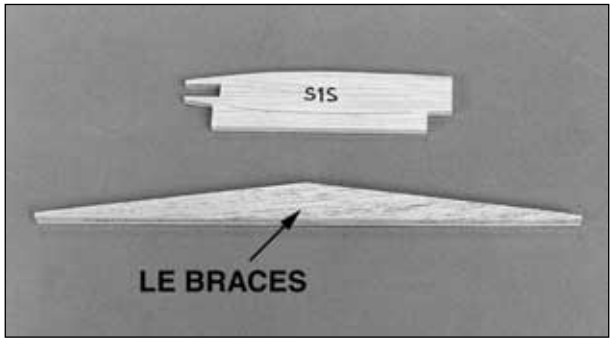
(2) planks – stab and rudder.
(2) planks – stab and elevator.
(2) planks – vertical fin and elevator.

**Beech Fact:** In 1946 Walter H. Beech announced his all new, revolutionary, single engine entry in the postwar market. He named it the Bonanza, descriptive of an extra value offered in the way of economy, performance and pleasure to the owner.

## BUILD THE STABILIZER AND ELEVATORS

Build the right and left stab halves simultaneously.

❏ 1. Position the plan so the stab is over your flat building board (or cut the stab from the plan), tape it down and cover it with waxed paper or Plan Protector.



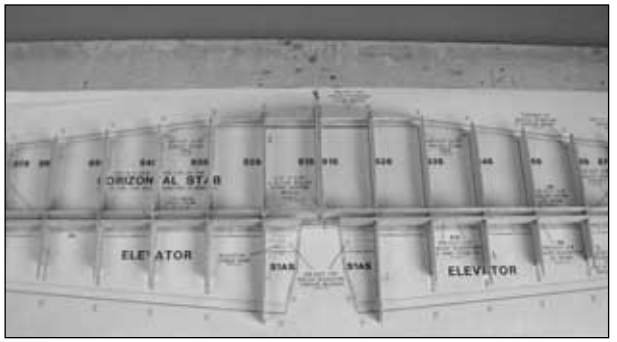

❏ 2. Glue both die-cut 1/8" [3.2mm] balsa **LE braces** together and both die-cut 3/32" [2.4mm] balsa **S1S ribs** together.

❏ 3. Test fit the die-cut 3/32" [2.4mm] balsa **stab ribs S2S** through **S7S** in the notches of both die-cut 1/8" [3.2mm] balsa **stab TE spars (S9)**. Make a left and right assembly. Place both assemblies over the plan and add the **LE brace**. See the photo at step 4.

❏ 4. Use a small square to align the stab TE spar at rib S2S over the plan. Pin rib S2S over its location on the plan with a T-pin about 1/4" in front of the TE spar. **Note:** The above photo shows S1S in place, but it is not installed until step 11.

❏ 5. Use the same method to align the TE spar and pin the rest of the ribs on both sides of the stab to your building board over the plan.

❏ 6. Pin the fronts of the ribs to your building board over the plan.




❏ 7. Add both die-cut 1/8" [3.2mm] balsa **elevator LE spars (S8)** to the assembly.

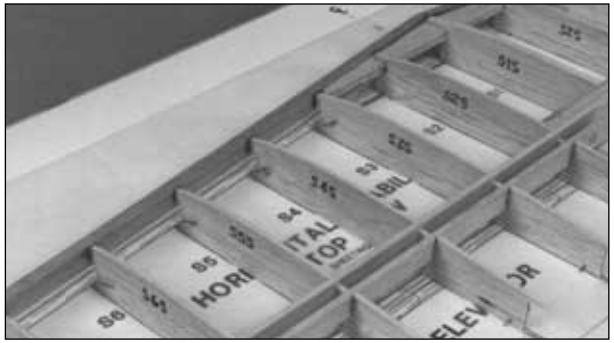
❏ 8. Make sure all the jig tabs of all the ribs are contacting your building board. Glue the stab TE spar and elevator LE spar to the ribs with medium CA. Don't use large amounts of CA or build up fillets of glue. Later we will instruct you to reinforce glue joints that don't look strong.

**Use this photo for the next three steps.**

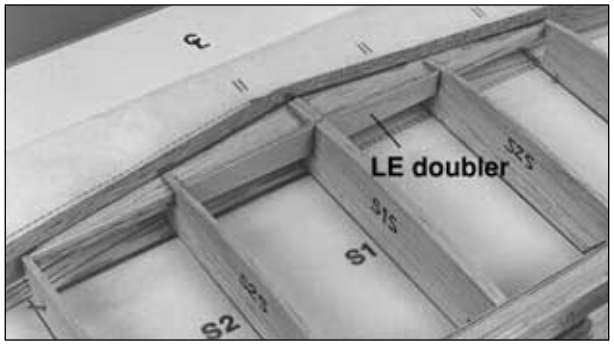

❑ 9. Glue the 1/4" x 5/8" x 4-3/8" [6.4 x 15.9 x 111mm] balsa **TE center brace** to **the front** of the stab TE spars of both stab halves.

❑ 10. Glue the die-cut 1/16" [1.6mm] plywood **TE doubler** to **the front** of the TE brace (it's the one with straight edges).

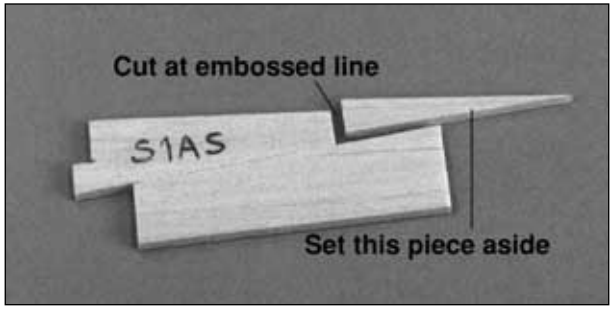
❑ 11. Add the die-cut 3/32" [2.4mm] balsa **center rib S1S** and glue it into position.

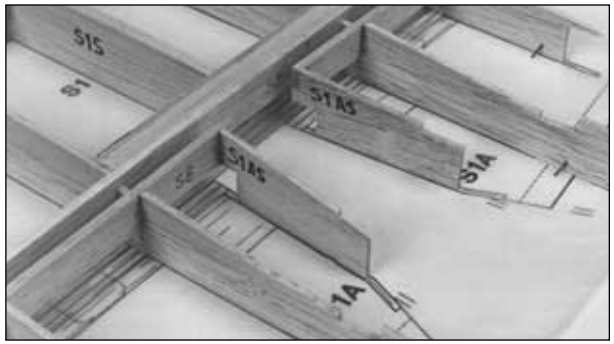


❑ 12. Sand the fronts of the ribs to match the aft sweep of the leading edge. Cut two shaped 5/16" x 15" [7.9 x 381mm] balsa **stab/fin leading edges** to a length of 13-3/4" [349mm] and bevel the joining ends to match the plan. Glue them to the ribs and the LE brace so the **top** edge is **even** with the **top** of the ribs. The bottom will extend below the ribs but will be sanded flush later.




❑ 13. Cut a 1/16" [1.6mm] notch in center rib S1S behind the LE brace. Test fit the die-cut 1/16" [1.6mm] plywood **LE doubler** in the notch. Deepen the notch as necessary so the top of the doubler is even with the top of rib S1S. Glue the doubler to the LE brace and glue rib S1S to the doubler.



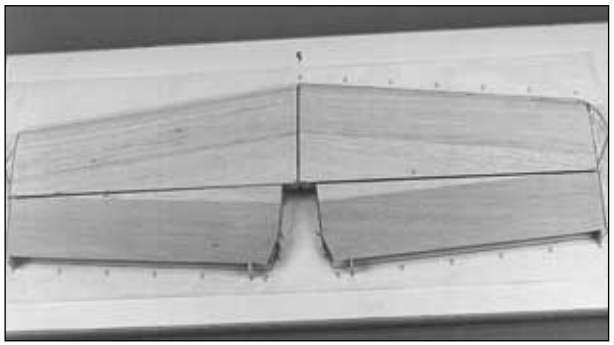




❑ 14. Cut the end off both die-cut 3/32" [2.4mm] balsa **S1AS ribs** at the embossed line and set those little pieces aside. They will be used later to glue the aft end of S1AS into position. Fit the S1AS's to the elevator LE spars, pin them to the plan, and then glue them to the elevator LE spars.

❑ 15. Sand the top of the leading edges, stab and elevator spars, and the TE brace so they match the contour of the ribs. Do not change the shape of the airfoil by sanding too much.

❑ 16. **THIS STEP IS VERY IMPORTANT!** Arrange the T-pins so **every other rib** is held down with one pin near the front and one pin near the rear and make sure all the pins go into the jig tabs **at the same angle**. This will allow you to remove the stab from your building board by lifting it up and to one side after the top sheeting is glued in place (because the T-pins are concealed).

❑ 17. Use your favorite method to glue the stab skin to the stab. We recommend using aliphatic resin to glue the skin to the ribs and TE spar, and medium CA for only the leading edge. Apply glue to the stab structure. Working quickly, position the stab skin and hold the leading edge down until the CA hardens. When the CA is hardened, wet the front of the skin with a 50/50 mix of alcohol and water and press it to the rest of the frame, holding it down with weights until the glue dries.
**Note:** If you choose to use CA for the entire job, be aware that residual accelerator you may have used earlier can make the CA you use for this step cure quickly. You'll have to work rapidly.

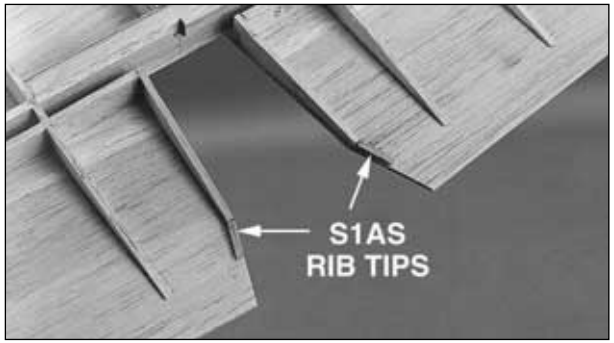


❑ 18. Glue the elevator skin to the elevator. You can use CA for this step since the skin is small and easy to position. Make sure the trailing edge contacts the stoppers on the top of the jig tabs on ribs S7S and S2S. **Note:** You may have to trim the LE of the skin to fit it into position.

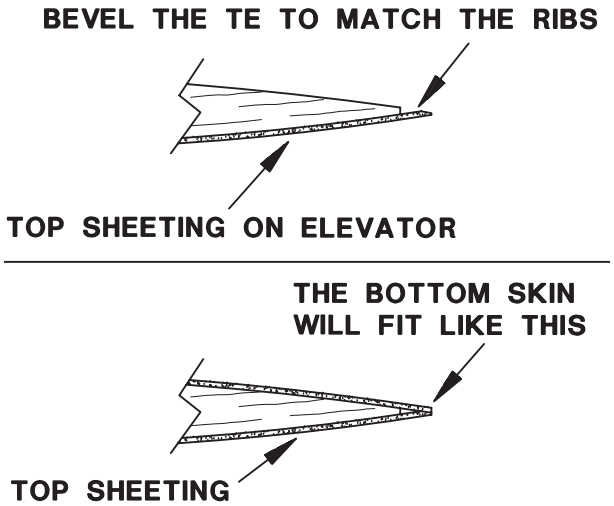
❑ 19. After the glue has thoroughly dried, remove all the T-pins you can reach. **Carefully** lift the stab (with the elevators) from your building board. Trim the jig tabs from the ribs and take out the rest of the T-pins.

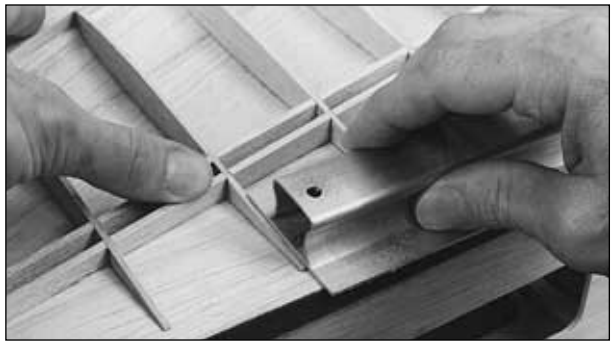
❑ 20. Use a razor plane or a #11 blade to trim the **bottom** of the LE so it is the same size as the front of the ribs and matches the airfoil shape.

❑ 21. Sand the bottoms of the ribs, leading edges, stab spars, elevator spars and the TE brace so they smoothly blend.

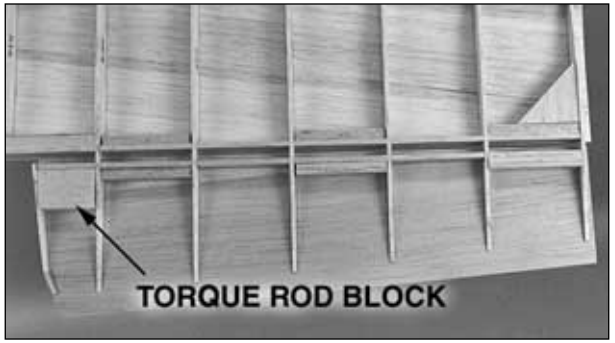



❑ 22. Glue the little tips you cut off the end of the S1AS ribs to the sheeting and S1AS.



❑ 23. Use a bar sander and 150-grit sandpaper to bevel the trailing edge of the top elevator skin so it will accommodate the bottom skin. While you sand, apply pressure only to the sheeting and use the ribs to set your sander at the correct angle. Do not bevel the trailing edge to a *sharp edge* but leave about 1/32" [0.8mm] *squared off*. **Hint:** Support the TE with the edge of your workbench or a platform while you sand.



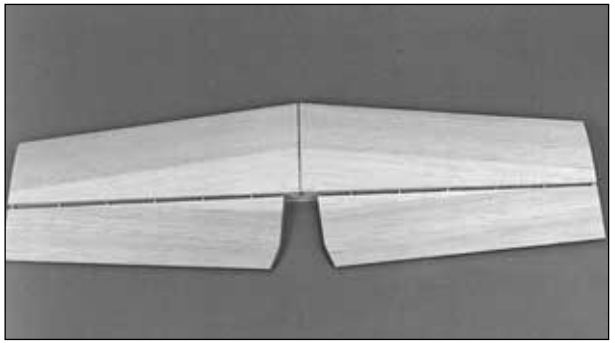

❑ 24. Glue four die-cut 1/8" [3.2mm] balsa **elevator torque rod blocks** between both sets of ribs S1AS and S2S.

❑ 25. Cut twelve 1-7/8" [47.6mm] long **hinge blocks** from the 1/4" x 3/8" x 36" [6.4 x 9.5 x 914mm] balsa stick. Glue them evenly spaced vertically to the stab TE spar and the elevator LE spar where shown on the plan. Glue the die-cut 1/8" [3.2mm] balsa **stab gusset** to the hinge block and rib S7S as shown on the plan. Position the gusset so it is even with the bottom of the hinge block so you do not break it when you cut the hinge slot.

❑ 26. Trim the elevator torque rod blocks and any protruding hinge blocks so they are even with the bottoms of the ribs.

❑ 27. Reinforce any glue joints that do not look strong.

**Use this photo for the next two steps.**



❑ 28. Glue the elevator skins to the bottom of the elevators so the trailing edges align.

**Optional:** Use the die-cut 1/8" [3.2mm] balsa **stab cradles S2T** and **S7T** to hold the stab flat on your workbench while you glue the bottom skins on. Use the stab cradles the same as the wing cradles shown in steps 1-5 on page 28.

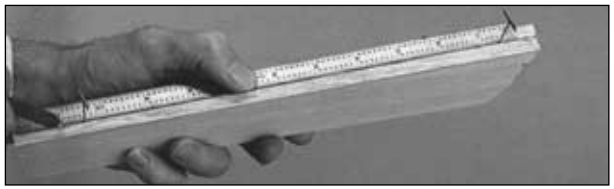
❑ 29. Glue the stab skins to the bottom of the stab. If you have not used any accelerator on the stab you may glue the skins on with thick or medium CA. Otherwise, use aliphatic resin. Work over a flat work surface and be careful not to add any twist into the stab as you press the skins to the stab frame.

❑ 30. After the glue dries, use a bar sander with 150-grit sandpaper to sand the sheeting even with the ends of the stab and elevators.

❑ 31. Cut the ribs and separate the elevators from the stab. Sand the excess sheeting and rib stubs from the TE of the stab and the LE of the elevator. Sand the elevator sheeting even with rib S1AS.

❑ 32. Glue a die-cut 1/8" [3.2mm] balsa **stab TE (S10)** to the TE of both stab halves. Glue a die-cut 1/8" [3.2mm] balsa **elevator LE (also S10)** to the LE of both elevators.

❑ 33. Sand the stab TE's and the elevator LE's so they are even with the ends of the stab and elevators. Sand the stab TE and elevator LE's so they blend with the tips and skins.



❑ 34. Use two T-pins, placed in the **center** of the leading edge of one of the elevators near the ends, to align a straightedge and draw a centerline with a ballpoint pen.

❑ 35. Mark the other elevator and the TE of the stab the same way.

## IMPORTANT NOTES ABOUT CA HINGES

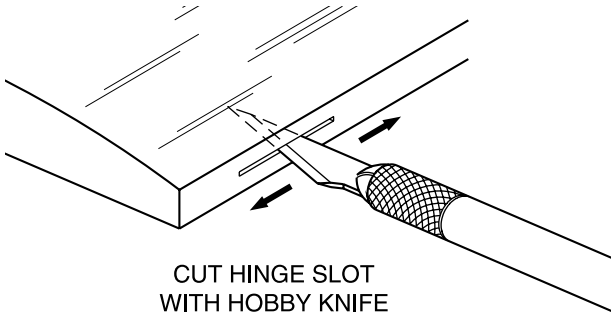
This kit is supplied with a CA hinge material consisting of a 3-layer lamination of Mylar and polyester. It is specially made for hinging model airplane control surfaces. When properly installed, this type of CA hinge provides the best combination of strength, durability and easy installation. We trust all of our Gold Edition warbirds to these hinges, but **it is essential to install them correctly**. Carefully follow the hinging instructions in this manual for the best result.

The most common mistake made by modelers when installing CA hinges is making the hinge slots too tight, restricting the flow of CA to the back of the hinges; or not using enough glue to fully secure the hinge over its entire surface area. This results in hinges that are only *tack glued* into the hinge slots. The techniques for cutting the hinge slots and gluing in the CA hinges (near the end of the manual) have been developed to ensure thorough and secure attachment.

## HOT TIP

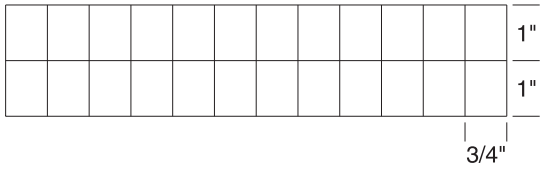
### HOW TO MAKE THE HINGE SLOTS


We HIGHLY recommend that you use the Great Plans Slot Machine™ for cutting your hinge slots. This motorized hinge slotting tool makes clean slots of the exact size needed for CA hinges. Once you use this tool, you will never cut your hinge slots any other way.



CUT HINGE SLOT
WITH HOBBY KNIFE
AND #11 BLADE

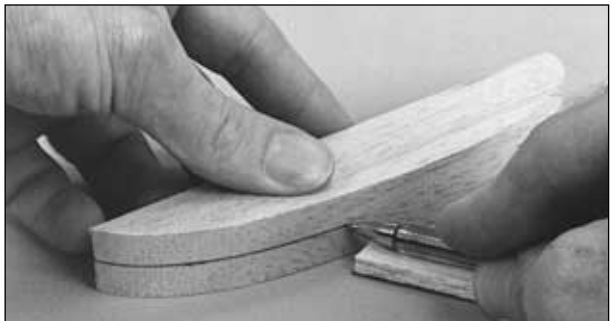
❑ 36. Cut the hinge slots on the centerlines of the elevators and the stab where shown on the plan.



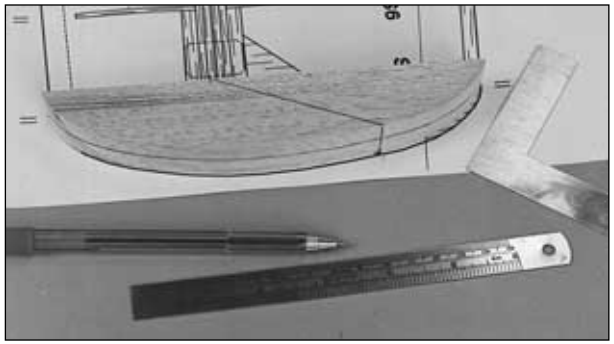

❑ 37. Cut six **hinges** from the 2" x 9" [51 x 229mm] **CA hinge strip** as shown in the sketch. Snip the corners off the hinges so they go into the slots easier. Temporarily join both elevators to the stab with the hinges. If necessary, adjust the hinge slots so the elevators and stab align.

❑ 38. Locate the 3/4" x 1-3/8" x 6-1/2" [19 x 35 x 165mm] shaped balsa **stab tip blocks**.

❑ ❑ 39. Securely tape the elevator to the stab with masking tape on both sides. Sand the ends of the stab and elevators so they are even.

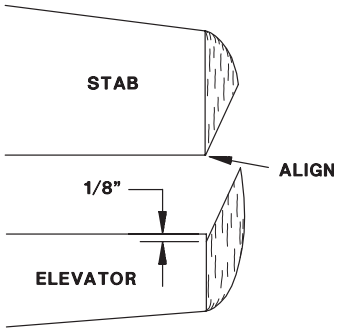


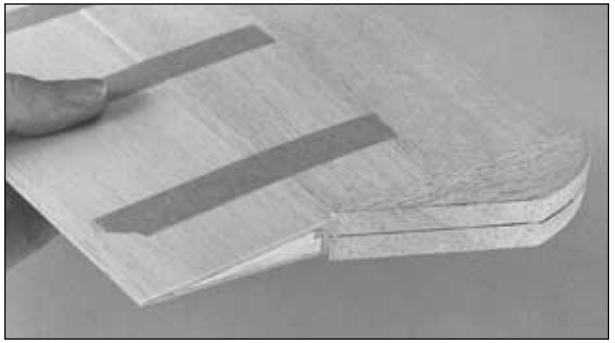
❑ ❑ 40. Draw a centerline all the way around a 3/4" [19mm] shaped balsa **stab tip block**.



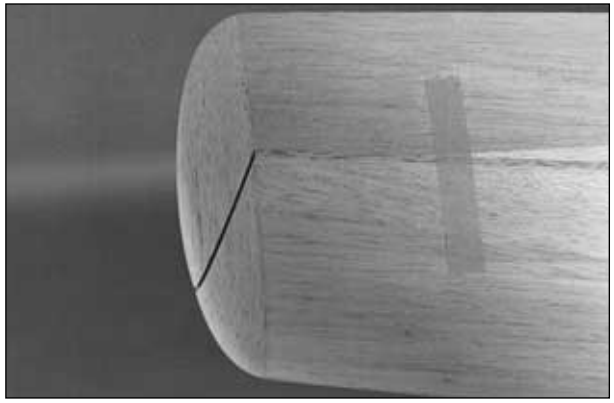
❏ ❏ 41. Place the stab tip block over its location on the plan. Mark where the elevator tip meets the stab tip on both sides of the block.

❏ ❏ 42. Cut the stab tip from the elevator tip. True the edges you just cut with a bar sander.



❏ ❏ 43. Glue the **stab tip** to the stab. The sharp *point* of the stab tip should align with the TE of the stab. Glue the **elevator tip** to the elevator so it is 1/8" [3.2mm] aft of the LE and aligns with the stab tip (as shown in the sketch).

❏ ❏ 44. Use a razor plane or a hobby carving knife, followed by sanding to **carefully** shape the elevator and stab tip. Inspect your progress frequently. Use the centerlines as a guide and the plan as a reference so you know what the curve of the tip should look like.
**Hint:** Stick a T-pin through the elevator tip into the stab. This will hold the elevator tip while you shape it.
**Note:** When you shape the left stab tip, in addition to the plan, use the finished tip on the right stab as a guide to shape the left stab tip. This way you can make sure both of the stab tips are identical.

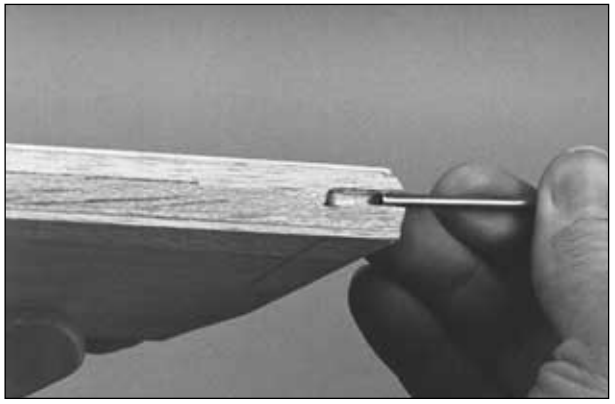
❏ ❏ 45. Shape the stab LE as shown on the plan.

❏ ❏ 46. Separate the elevator from the stab.

❏ ❏ 47. Shape the leading edge of the elevator to a "V" as shown on the plan. Use the centerline on the leading edge as a guide. Make sure that the angle of the "V" will allow the throws indicated in the back of the manual.

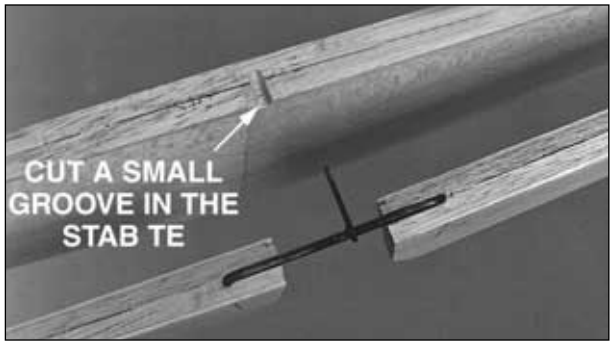
❏ 48. Go back to step 39 and do the other stab tip.

❏ 49. Using the plan, accurately mark the location of the 1/8" [3.2mm] **elevator joiner wire and horn** (from now on referred to as just the ***elevator joiner***) on the elevators.



❏ 50. Drill a 9/64" [3.6mm] hole 1-1/4" deep and cut a groove in the center of both LE's for the joiner. Test fit the elevator joiner in the elevators.

**Hint:** Use a 1/8" [3.2mm] brass tube sharpened at one end to cut the grooves.



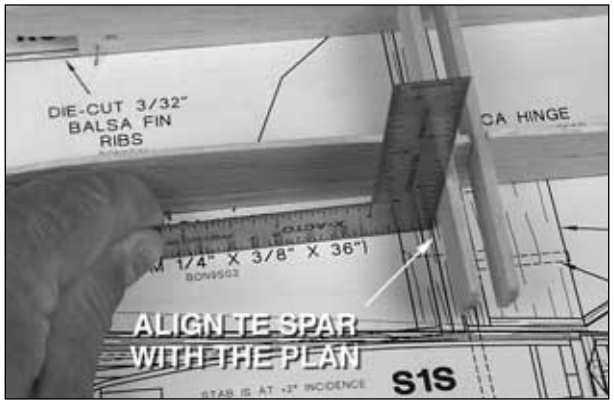

❏ 51. Cut a small groove in the TE of the stab so the **horn** on the elevator joiner will not bind against the stab when the elevator deflects downward. Test fit the elevators to the stab, with the elevator joiner in place, and make adjustments if necessary.

**T-34 Fact:** The T-34 began as a private venture by Walter Beech shortly after the end of WWII. The Beechcraft Model 35 Bonanza had been developed and Mr Beech felt there was a market for a military trainer based on the Bonanza. After the war, there were over 50,000 war-surplus trainers still in the inventory and there was a lack of funding for a new trainer, so Beech built several proof of concept aircraft as a private venture. They used the same basic wing, landing gear and some fuselage parts from the Bonanza and one even had the classic V-tail. These aircraft were developed under the company designation Model 45. The first prototypes use a 205 hp Continental engine while later prototypes used a more powerful 225 hp engine.

## *BUILD THE FIN AND RUDDER*

❏ 1. Place the fin plan over your building board and cover it with Plan Protector or waxed paper.

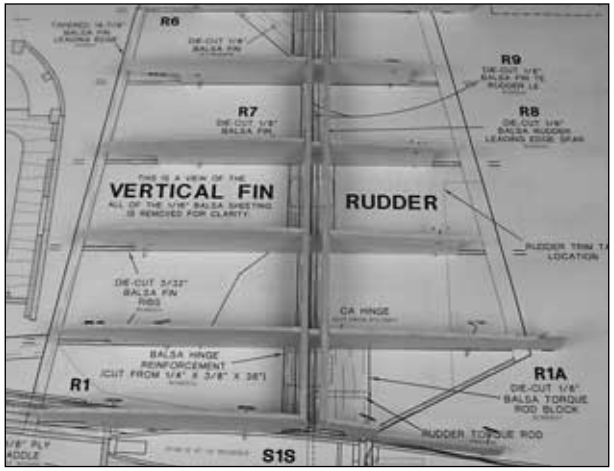
❏ 2. Test fit the die-cut 3/32" [2.4mm] balsa **fin ribs R2 through R6** in the notches of the die-cut 1/8" [3.2mm] balsa **fin TE spar (R7)** and **rudder LE spar (R8)**. Place the assembly over the plan.




❏ 3. Use a small square to position the fin TE spar over the plan near rib R2. Align rib R2 over the plan and pin it to your building board. Use one T-pin near the front of the jig tab and one T-pin near the rear of the jig tab.

❏ 4. Use the same method to align the fin TE spar over the plan at each rib. Pin the rib to your building board. Glue the ribs to the spars with medium CA. Use small drops of CA and do not build up fillets. Later, we will remind you to reinforce the glue joints.

**Refer to this photo for the next three steps**

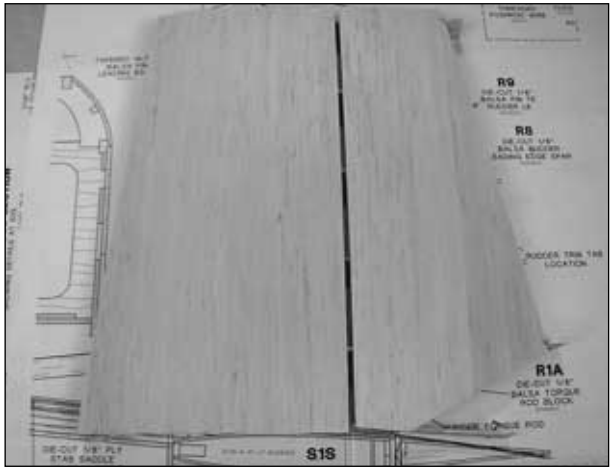



❏ 5. Pin rib **R1** in place and glue it to the spar. Cut the end off rib **R1A** at the embossed line and set the cut-off piece aside. Pin the remaining part of R1A in place and glue it to the rudder LE spar.

❏ 6. Sand the fronts of the ribs to match the aft sweep of the leading edge. Cut a shaped 5/16" x 15" [8 x 381mm] balsa **stab/fin leading edge** to a length of 11" [280mm]. Glue it to the front of the ribs so the **top** edge of the LE is **even** with the **top** of the ribs. The bottom of the LE will extend below the bottom of the ribs but will be sanded flush later.

❏ 7. Sand the upward facing edges of the leading edge and the sub spars so they match the contour of the ribs. Do not change the shape of the airfoil by sanding too much.

❏ 8. Arrange the T-pins so they all go into the jig tabs at the same angle. This will allow you to remove the fin and rudder from your building board by lifting it up and to one side after the top sheeting is glued in place (because the T-pins are concealed).




❏ 9. Glue the fin and rudder skin to the structure. The bottom of the fin skin should extend below rib R1 by approximately 1/4" [6.4mm] so you can trim it later. Make sure the trailing edge of the rudder meets the stoppers on the top of the jig tabs on ribs R2 and R6. **Note:** The rudder skin was cut wider than needed, to allow enough material to trim it to size now.

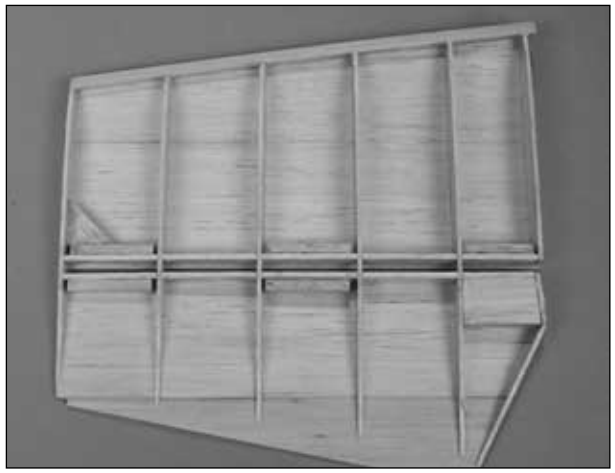
❏ 10. After the glue has thoroughly dried, remove all the T-pins you can reach. Carefully lift the fin (with the rudder) from your building board. Trim the jig tabs from the ribs and take out the rest of the T-pins.

❏ 11. Use a razor plane or a #11 blade to trim the right side of the LE so it is the same size as the front of the ribs and matches the airfoil shape.

❏ 12. Sand the ribs, leading edges, fin spar, rudder spar and trailing edges so that they blend.

❏ 13. Glue the end of R1A, that was cut off earlier, to the sheeting and to R1A.

❏ 14. Bevel the trailing edge of the left rudder skin the same way you did the stab.



❏ 15. Glue the four die-cut 1/8" [3.2mm] balsa **rudder torque rod blocks** between ribs R1A and R2 in the rudder.

❏ 16. Cut five 1-7/8" [47.6mm] long **hinge blocks** from the 1/4" x 3/8" x 36" [6.4 x 9.5 x 914mm] balsa stick. Test fit, then glue the hinge blocks, evenly spaced vertically, to the fin TE spar and the rudder LE spar where shown on the plan.

❏ 17. Glue the die-cut 1/8" [3.2mm] balsa **fin gusset** to the hinge block and rib R6. The gusset should be raised so it is even with the left side of the fin TE and rib R6 (so it does not interfere with the hinge slot).

❏ 18. Trim the rudder torque rod blocks and any hinge blocks so they are even with the ribs.

❏ 19. Reinforce all glue joints that don't look strong.

❏ 20. Glue the other rudder and fin skin to the right side of the rudder and fin. **Optional:** Use the die-cut 1/8" [3.2mm] balsa **fin/stab cradles R1C** and **R6C** to hold the fin and rudder flat on your workbench while you glue the right skins on.

❏ 21. Sand the tip of the fin and rudder sheeting flush with rib R6.

❏ 22. Cut the ribs and separate the rudder from the fin. Sand the excess sheeting and rib stubs from the TE of the fin and the LE of the rudder. Sand the bottom of the rudder even with rib R1A.

❏ 23. Glue a die-cut 1/8" [3.2mm] balsa **fin trailing edge (R9)** to the fin TE spar and a die-cut 1/8" [3.2mm] balsa **rudder leading edge (R9)** to the rudder LE spar. Sand the fin TE and rudder LE so they blend with the tips and skins.

❏ 24. Use the *straightedge and pin* technique to draw a centerline on the LE of the rudder and the TE of the fin.

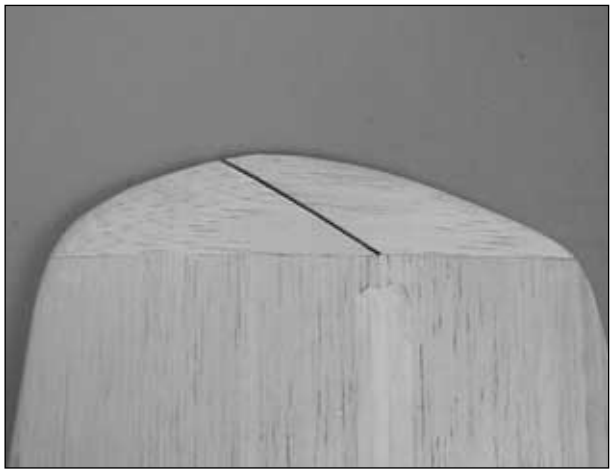
❏ 25. Cut the **hinge slots** on the centerline of the fin and rudder where shown on the plan.

❏ 26. Cut three more hinges from the hinge strip and temporarily join the rudder to the fin. If necessary, adjust the hinge slots so the fin and rudder align.

❏ 27. Securely tape the rudder to the fin with masking tape on both sides. Sand the ends of the fin and rudder so they are even.

❏ 28. Draw a centerline on the top and bottom of the 3/4" x 1-7/16" x 7-3/8" [19 x 36.5 x 187mm] balsa **fin tip block**. Cut the block into two pieces as shown on the plan. Sand the edges you just cut so they are smooth and match the angle on the plan.

**Use this photo for the next two steps.**



❏ 29. Use thick or medium CA to glue the rudder and fin tip blocks to the rudder and fin in the same manner that you glued the tip blocks to the elevator and stab. Use the centerline on the tip blocks as a guide to make sure it is centered on the rudder and fin.

❏ 30. Use a razor plane or a hobby carving knife followed by sanding to carefully shape the fin and rudder tip blocks. Inspect your progress frequently and use the centerlines as a guide.
**Hint:** Stick a T-pin through the top of the rudder tip into the fin. This will hold the rudder tip while you shape it.

❏ 31. Shape the LE of the fin as you did with the stab.

❏ 32. Separate the rudder from the fin.

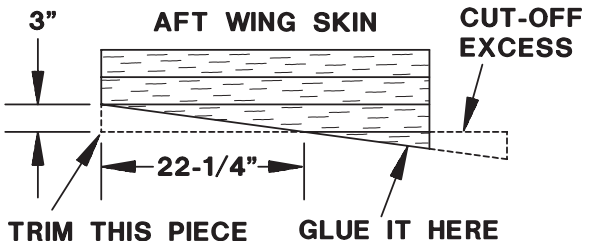
❏ 33. Shape the leading edge of the rudder to a "V" as you did with the elevators. Use the centerline on the leading edge as a guide. Make sure the angle of the "V" will allow the throws indicated in the back of this manual.

What a nice piece of workmanship! Put the stab and fin in a safe place, clean off your workbench, vacuum the floor, then read the following T34 Fact.

**T34 Fact:** The Model 45 made its first test flight on December 2, 1948. After the U.S. Air Force was shown the prototypes, they ordered three test aircraft under the designation YT-34. The Model 45 made its' public debut at the 1949 Cleveland Air Races and was flown by Bevo Howard and Betty Skelton. Bevo Howard's Hawthorn Aviation later became the Air Force's first contract flight school to use the T-34.

## BUILD THE WING

### *MAKE THE WING SKINS*




❏ 1. Glue **three** 3/32" x 3" x 36" [2.4 x 76 x 914mm] balsa sheets together to make an **aft wing skin**. Trim a *wedge* from the aft wing skin. Glue it back onto the skin as shown in the sketch.

❏ 2. Glue **two** 3/32" x 3" x 30" [2.4 x 76 x 762mm] (**not** 36" [914mm]) balsa sheets together to make the **forward outer wing skin**.

**Note:** You will need a total of *four* **aft wing skins** and *five* **forward outer wing skins** (one of the forward wing skins will be cut into four pieces to make the forward **inner** skins). You can make all the wing skins now in an **assembly line** fashion or make them as needed.

❏ 3. After the glue dries, remove the masking tape and mark the best side of each skin as the top. Sand the bottoms of both wing skins so they are flat (or almost flat). Sand the tops of the skins so they are flat and smooth.

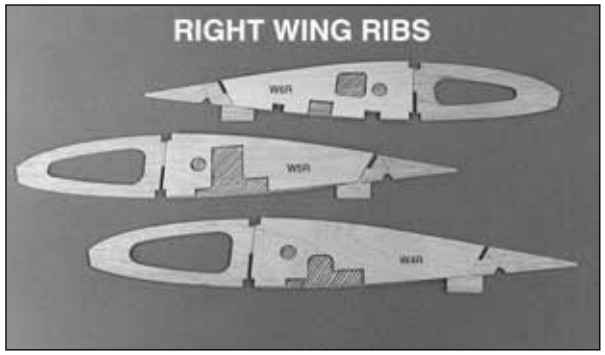
### *PREPARATIONS*

❏ 1. Unroll the wing plan. Roll it inside out so it will lie flat. Cut the **right** wing panel with the center section from the wing plan. Position it on your **flat** building board and cover the plan with Plan Protector or waxed paper.

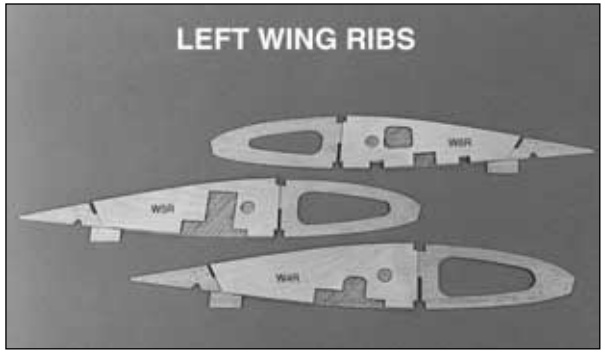
During construction of the wing and fuselage, some steps refer to fixed gear installation and other steps refer to retractable gear installation. Steps for fixed gear start with "F" and steps for retractable gear start with "R".

Perform steps R2 through R6 if you are installing retractable landing gear.


Have you purchased your retracts yet? If you have (or as soon as you do), take the neoprene air lines out of the package and hang them from a hook somewhere in your shop, letting them dangle under their own weight. This will get all the kinks out and make them easier to work with when it's time to install them.

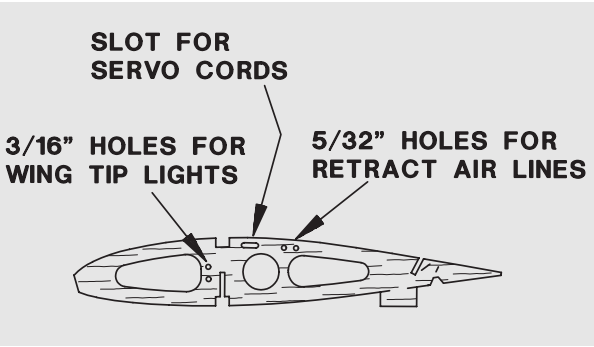



**R2**. Prepare a set of **right** wing ribs by using 30-minute epoxy to glue the die-cut 1/16" [1.6mm] plywood **retract landing gear rib doublers W4R, W5R** and **W6R** to the die-cut 3/32" [2.4mm] balsa **ribs W4, W5** and **W6** ***exactly*** as shown in the photo. Make sure the doublers are on the side of the ribs as shown in the photo and on the right wing plan.

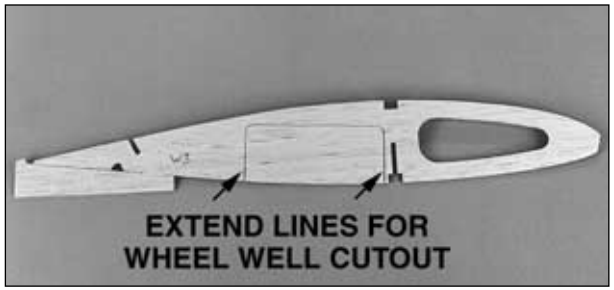



**R3**. Prepare a set of **left** wing ribs the same way but **use the photo above** to make sure you glue the doublers to the correct side of the ribs.

**R4**. Remove the shaded area of balsa shown in the previous two photos after the epoxy is fully cured.




**R5**. Drill 5/32" [4mm] holes and cut slots at the locations suggested in the sketch in both sets of ribs W2, W3 and W4 for the retract air lines and servo leads. Make the slots large enough so the connectors on the ends of your servo leads will pass through. **Hint:** An appropriate size brass tube sharpened at one end cuts very clean holes.




**R6**. Use a ballpoint pen to *extend* the die-cut *wheel well cutout* in both W3 ribs. Cut partway through the rib along the line so the cutout will be easier to remove later.

**Note:** Details for retractable landing gear are shown on the **right** wing plan.

**T-34 Fact:** The T-34 ended up being the last project done by Walter Beech, who died of a heart attack late in 1950. Of the six prototype/service test aircraft, only one remains and is on static display at March AFB.

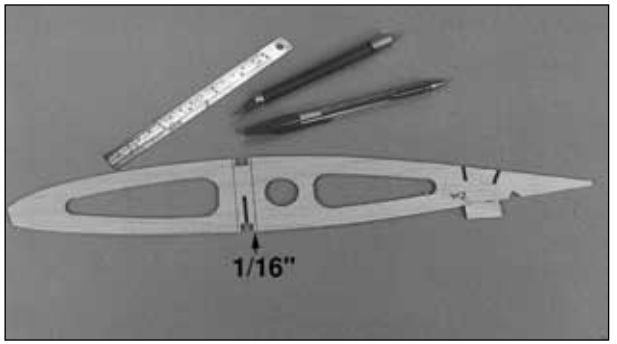
**Perform steps F7 through F10 only if you are installing fixed landing gear.**


❏ F7. Prepare a set of **right** wing ribs by using 30-minute epoxy to glue the die-cut 1/8" [3.2mm] plywood **fixed landing gear rib doublers W4G, W5G** and **W6G** to the die-cut 3/32" [2.4mm] balsa **ribs W4, W5** and **W6** ***exactly*** as shown in the photo. Make sure the doublers are on the side of the ribs as shown in the photo.


❏ F8. Prepare a set of **left** wing ribs the same way but **use the photo above** to make sure you glue the doublers to the correct side of the ribs.

❏ F9. Remove the shaded area of balsa shown in the previous two photos after the epoxy is fully cured. **Note:** Details for fixed landing gear are shown on the **left** wing plan.

❏ F10. Cut slots at the locations suggested in the sketch in both sets of ribs W2, W3 and W4 for the servo leads. Make the slots large enough so the connectors on the ends of your servo leads will pass through. (See R5)



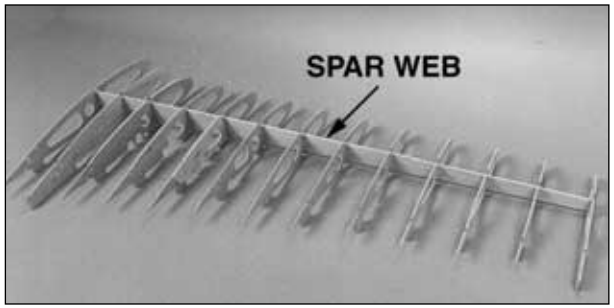

❏ 11. Use a straightedge and a ballpoint pen to mark a vertical line 1/16" [1.6mm] from the front and back of the spar notches in both **W2 ribs**. Use a sharp hobby knife to **lightly** cut halfway through the balsa along the lines. You will remove this section of balsa to accommodate the spar joiners when it is time to join the wing.

## *BUILD THE OUTER WING PANELS*

*For clarity, some of the photos show the wing off the building board without the plan, but of course you should build your wing over the plan as we do.*

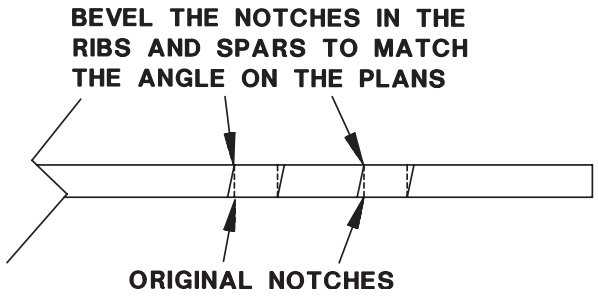
*Build the **right** wing panel first so your progress matches the photos.*

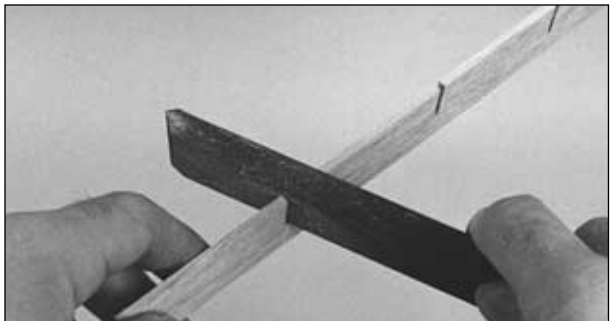
❏ ❏ 1. **Do not use any glue until step 8**. Pin a 1/4" x 3/8" x 36" [6.4 x 9.5 x 914mm] basswood **bottom spar** over its location on the plan so the root end extends past the dashed line by about 1/8" [3.2mm]. Stick the pins through the spar at an angle so they will not interfere with the spar web when you position it in the next step.



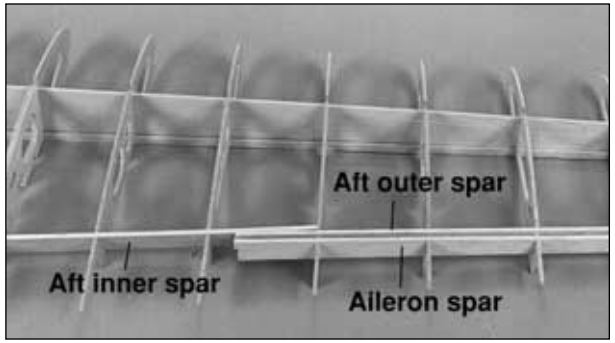

❏ ❏ 2. Test fit ribs **W2 through W14** to the die-cut 1/8" [3.2mm] balsa **spar web (W15)**. If necessary, deepen the notches (in the ribs or in the spar web) so the ribs fit all the way into the spar web.
**Note:** Do not be concerned if the ribs do not exactly align spanwise with the plan. Paper plans can expand and contract as much as 1/8" [3.2mm] due to moisture.

❏ ❏ 3. Fit the ribs and spar web to the bottom spar so the ribs align as close as possible with the plan.



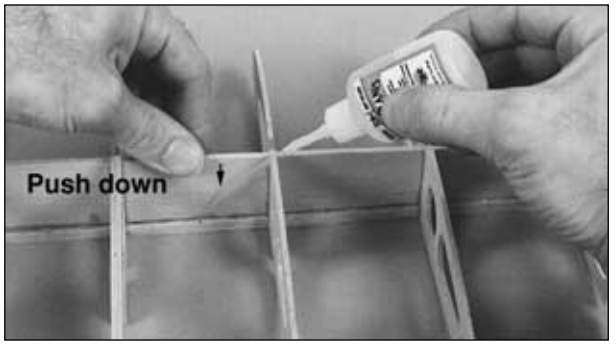
❏ ❏ 4. Test fit the die-cut 1/8" [3.2mm] balsa **aft inner spar (W18)** into the notches of ribs W2 through W9. If the spar fits too tightly use a single edge razor blade or a flat Perma-Grit sander to bevel the notches in the ribs and the spar at the same angle that they cross. Reinstall the aft inner spar.



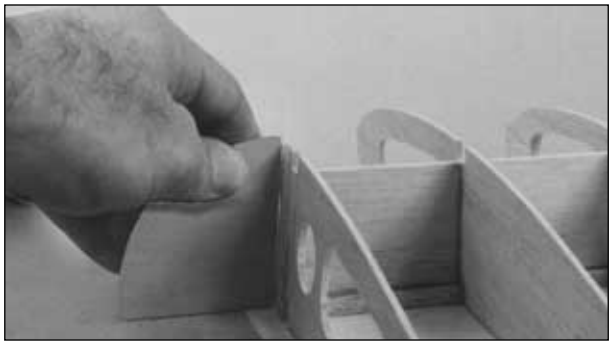

❏ ❏ 5. Test fit the die-cut 1/8" [3.2mm] balsa **aft outer spar (W16)** and the die-cut 1/8" [3.2mm] balsa **aileron spar (W17)** into the notches of ribs W9 through W14. If necessary, bevel the notches in the spars and ribs the same way you did in the previous step.

❏ ❏ 6. Temporarily remove rib W2 from the assembly.

❏ ❏ 7. One at a time, accurately align the jig tabs of all the ribs with the plan and pin them to your building board. In addition to T-pins, place weights on top of the ribs and the aft spars to insure that **all the jig tabs are contacting your building board**. Inspect all joints and make sure everything aligns with the plan. The spar web must fully contact the bottom spar. A die-cut 1/8" [3.2mm] plywood **90 degree gauge** is supplied in the kit to help you keep the ribs vertical as you glue them.

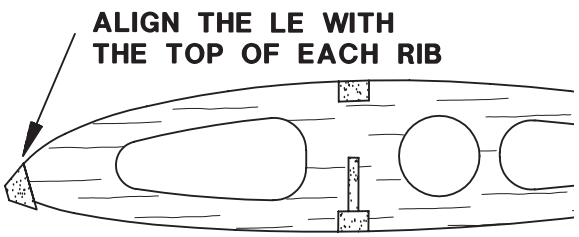


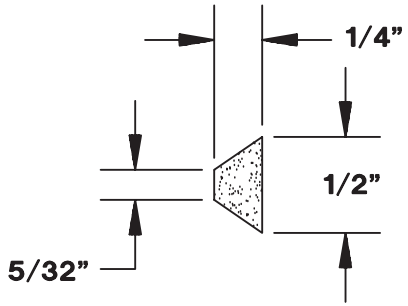

❏ ❏ 8. Use medium or thin CA to glue all the joints. Use the CA sparingly at this stage of construction and do not build up fillets. This will allow you to realign parts if necessary and keep you from gluing the jig tabs to the ribs. We will remind you to reinforce all glue joints later.



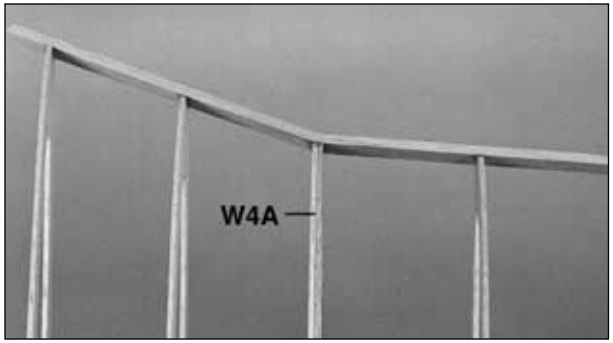
❏ ❏ 9. Place rib W2 back onto the assembly. Align W2 with the dashed line depicting where it contacts the plan. Use the die-cut 1/8" [32.mm] plywood **dihedral gauge** to set W2 at the correct angle. Glue it to the bottom spar and the spar web. Glue W2 to the aft inner spar using the dihedral gauge to set it at the correct angle.

❏ ❏ 10. Test fit a 1/4" x 3/8" x 36" [6.4 x 9.5 x 914mm] basswood **upper spar** in the notches of the ribs so the end of the spar aligns with rib W2. Glue the spar to the ribs and the spar web with thick or medium CA. Remember, don't use too much glue.




❏ ❏ 11. Cut a 1/4" x 36" [6.4 x 914mm] shaped balsa **leading edge** to a length of 29-1/2" [749mm]. Glue the LE to ribs W4 through W14 so the top aligns with the tops of the ribs (the same as on the stab).




❏ ❏ 12. Bevel the end of the remaining piece of 6-1/2" [165mm] leading edge so it matches the LE on the wing when you position it on ribs W4, W3 and W2. Glue it in position. Glue **rib W4A** to the side of rib W4. **Hint:** Glue the LE to rib W2 *last* so you can use the dihedral gauge to make sure W2 is at the correct angle.

**Note:** Use a long straightedge along the length of W2 to insure that it is flat along it's length (from the LE to the TE).

**Beech Fact:** In 1952 the USAF ordered the YT-34 into production under the designation T-34A Mentor. Beechcraft built a total of 353 T-34 Mentors for the USAF. [An additional 100 were built for the USAF in Canada, as well as 25 for the Canadian Air Force.] The T-34A was in production from 1953 to 1956.

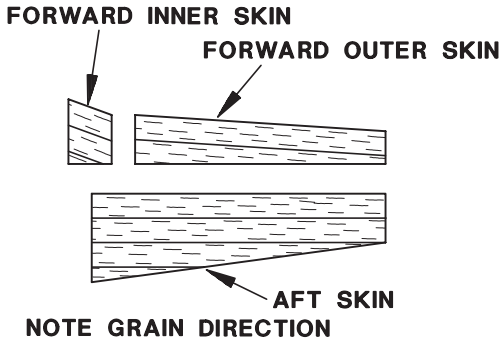
## SHEET THE TOP OF THE WING PANELS

❏ ❏ 1. Use a large sanding block or a bar sander with 150-grit sandpaper to sand the tops of the top spar, aft spars, LE and ribs so they all smoothly blend together. Make sure the tops of the aft spars match the tapering angle of the ribs but sand the ribs lightly so you maintain the designed airfoil shape.

❏ ❏ 2. Remove the T-pins from the bottom spar and replace them so they are all sticking in from the front. This way you will be able to remove them when the aft top sheet is in position. Remove the T-pins from the aft jig tabs and replace them in every other jig tab so they all go into the building board at the same angle (*you know the drill*). Remove the weights from the top of the wing (if you used them).

**Note:** If you observe that the wing panel remains flat and all the jig tabs are contacting your building board when you remove the T-pins, you may leave the T-pins out of the jig tabs. In this case the weights that will be used to hold the sheeting to the ribs will be enough to hold the wing flat to your building board.

**Use this photo and the sketch for the next few steps**. This photo shows a few weights on top of the wing, but in actuality we used enough weights to fully cover the skins. You can use magazines for weights too. T-pins in the front ensure that the skins are securely bonded to the top spar.



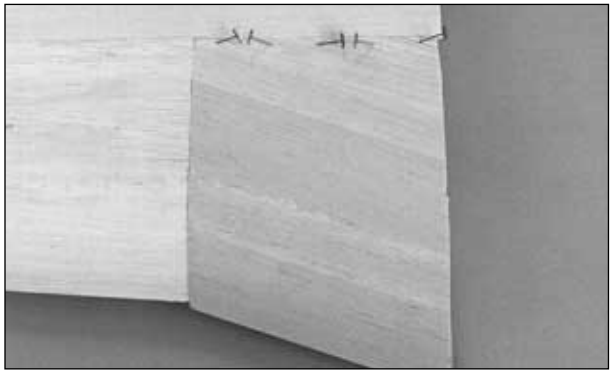

❏ ❏ 3. Trim the aft wing skin so it fits the wing. The **TE** should be straight and true and contact the *stopper* portion of the jig tabs on ribs W14 and W3. The **front** of the sheet should *end* in the center of the top spar. The ends should extend past W2 and W14 equally.

❏ ❏ 4. Use your favorite method to glue the **aft** wing skin to the wing. We recommend using aliphatic resin because it gives you plenty of time to align the skin and position your weights or T-pins. Hold the wing skin in position with magazines or weights made from plastic bags filled with lead shot or BBs. If you choose to use T-pins to hold the skin to the wing, **lightly** mark lines on the top of the wing skin indicating the location of the ribs underneath. **Do not disturb the wing until the glue fully cures.**

❏ ❏ 5. Remove the T-pins from the bottom spar. The weights on the aft sheeting will hold your wing flat.

❏ ❏ 6. Trim the forward **outer** wing skin so it fits the wing. The **aft** edge of the skin should contact the aft skin (in the center of the spar) and the **front** edge of the skin should extend past the leading edge of the wing by approximately 1/4" [6.4mm]. The **root** end of the sheet should accurately align with the glue joint between W4 and W4-A and the **tip** of the sheet should extend past W14 by about 1/16" [1.6mm].
**Note:** The grain direction of the forward outer skin runs **parallel to the leading edge** of the wing.

❏ ❏ 7. Wet the top of the forward outer skin with a 50/50 mix of alcohol and water so it will bend easier. Glue it to the wing using weights or T-pins to hold it down.



❏ ❏ 8. If you haven't already done so, glue two more 3/32" x 3" x 30" [2.4 x 76 x 762mm] balsa sheets together for the **forward inner skin**. From that sheet, cut a piece that fits between ribs W2 and W4 and glue on a third piece cut from leftover 3/32" [2.4mm] balsa to fill up the rest of the space. Note that the grain direction is parallel to the leading edge between ribs W2 and W4. Trim the sheet to fit the wing. Glue it in position.

❏ ❏ 9. After the glue on all the sheeting is dry, remove the T-pins you can reach and lift the wing off your building board. Remove any remaining T-pins.

❏ ❏ 10. Clean the glue blobs and wood chips off your workbench so they won't leave dents in your beautiful wing sheeting. Turn the wing over and carefully cut the jig tabs off the ribs.

❏ ❏ 11. Reinforce all glue joints that don't look strong. It is particularly important that the joints between the spar web and both spars are securely glued.

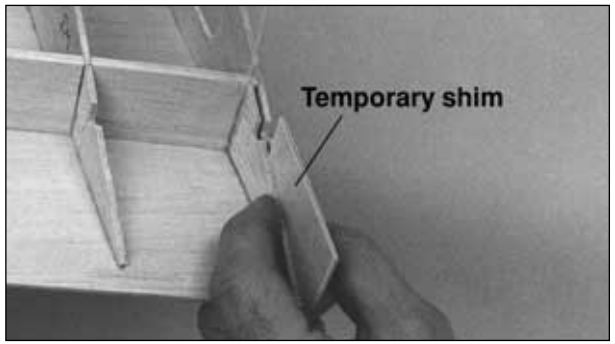
❏ 12. Position the **left wing plan** on your building board and cover it with Plan Protector or waxed paper. Return to step 1 on page 19, and repeat the steps to build the left wing panel.

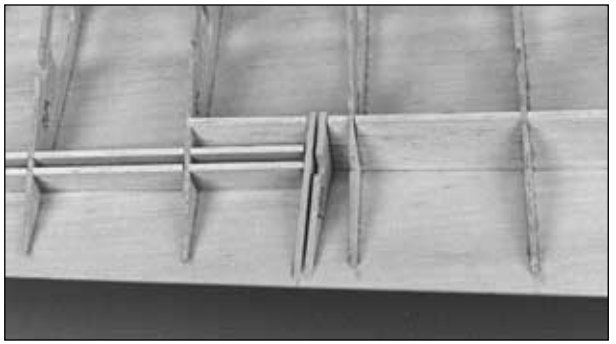
## FINISH THE OUTER WING PANELS

*Start with the **right** wing panel so your progress matches the photos.*

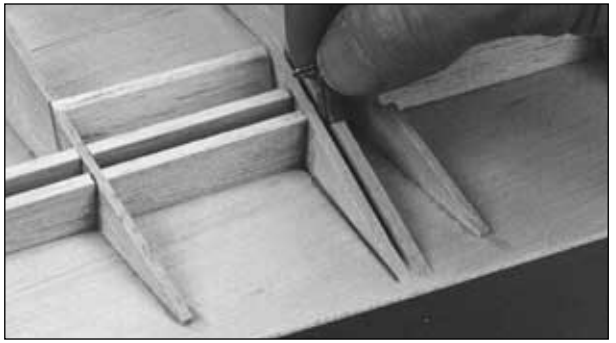
❏ ❏ 1. Glue a die-cut 3/32" [2.4mm] balsa **sub-rib W2D** to rib W2 where shown on the plan. The sub rib provides additional gluing area when the sheeting is installed.

**Note:** The photo below shows W2A being glued into position. The photo does not show W2D, which should already be in place. (We made a change after the photo was taken).

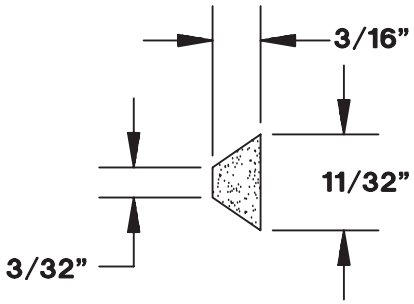


❏ ❏ 2. Glue the die-cut 3/32" [2.4mm] balsa **flap ribs W2A** and **W8A** and **aileron ribs W9A** and **W14A** to the wing where shown on the plan. Note that W8A and W9A are perpendicular to the aileron spar W17. **Hint:** Temporarily place a *shim* made from 1/16" [1.6mm] leftover plywood between the ribs for perfect alignment.

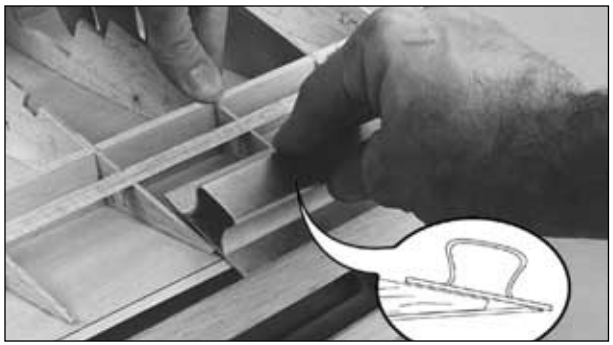


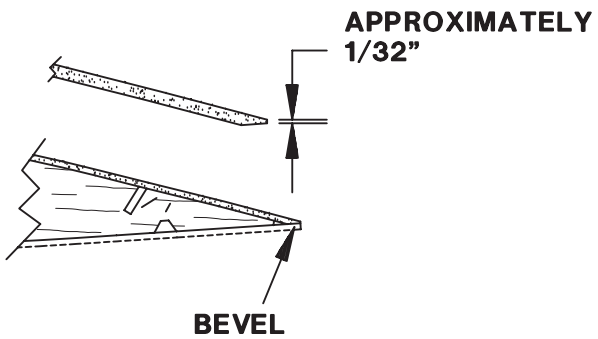
❏ ❏ 3. Stick a pin through the wing sheeting in a few places along the space between W8A and W9A, along the space between W2A and W2D, and along the space between W14A and W14. These pin points will indicate where to cut the sheeting to separate the ends of the flap and aileron from each other and the wing.




❏ ❏ 4. Cut a shaped 18” [457mm] balsa **flap spar** to fit between flap ribs W2A and W8A. Test fit, then glue the flap spar in the notches of the flap ribs.

❏ ❏ 5. Starting with 80-grit sandpaper on a large sanding block or your bar sander, sand the remainder of the jig tabs from the ribs and blend the bottoms of the aft spars, the aileron spar and the LE to the contour of the ribs.

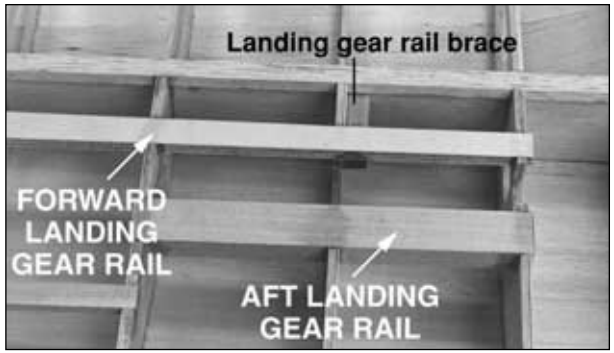





❏ ❏ 6. Use a bar sander and 150-grit sandpaper to bevel the trailing edge of the top wing skin so it will accommodate the bottom skin. While you sand, apply pressure only to the sheeting and use the ribs to set your sander at the correct angle. **Do not** bevel the trailing edge to a *sharp edge* but leave about 1/32” [0.8mm] *squared off*. **Hint:** Support the TE with the edge of your workbench or a platform while you sand.

Perform steps R7-R13 if you are installing retractable landing gear.

**Note:** Details for retractable landing gear are shown on the **right** wing plan. If you are going to install gear doors on your T-34, you will need to recess the retract units into the landing gear rails so that the doors will be flush with the bottom of the wing. If you do so, reinforce the top of the forward 1/4” [6.4mm] ply rail with some leftover 1/4” x 3/8” [6.4 x 9.5mm] basswood.



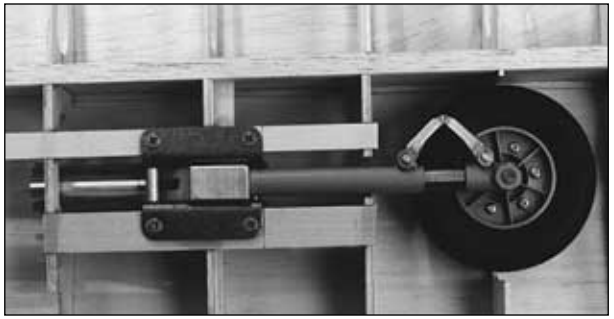

❏ ❏ R7. Cut the 1/2” x 3/4” x 6-3/4” [12.7 x 19 x 172mm] grooved basswood **aft landing gear rail** to a length of 6-1/8” [155.6mm]. Test fit, then glue the rail in position with 30-minute epoxy **(with the groove facing the top sheeting)**. Test fit, then glue the 1/4” x 1/2” x 9” [6.4 x 12.7 x 229mm] plywood **forward landing gear rail** in position with 30- minute epoxy. Immediately proceed to the next step before the epoxy cures.

❏ ❏ R8. From a 1/4” x 3/8” x 24” [6.4 x 9.6 x 610mm] basswood stick, cut a piece that is 1-1/2” [38mm] long. Glue this **landing gear rail brace** to rib doubler W5R and the bottom of the forward landing gear rail with 30-minute epoxy.

❏ ❏ R9. Test fit your retract unit with only the strut but not the wheel. If necessary, enlarge the clearance holes in the ribs and doublers so the air cylinder and the strut do not interfere with the ribs.

❏ ❏ R10. Cut along the line you started earlier on rib W3 for the wheel cutout and remove the section of balsa for the wheel.

❏ ❏ R11. Mount a wheel to your landing gear strut. Cut the axle to length. Place your retract unit on the landing gear rails in the location shown on the plan (by the way, the oleo *scissors* face **forward**). Retract the wheel by hand to check the operation and make sure your retract is mounted in the correct location. *Now is the time to plan your installation and make sure everything fits. It will be more difficult to make corrections after the bottom sheeting is in place.*



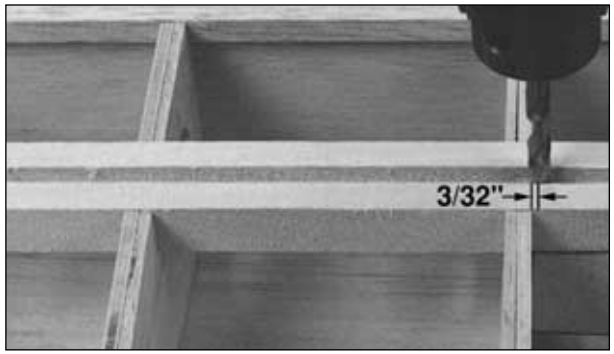
❏ ❏ R12. Drill holes in the rails and mount your landing gear. Use the screws included with your landing gear. Remove the landing gear and reinforce the holes with a few drops of thin CA. When the CA has cured, reinstall the landing gear. **Hint:** Countersink the holes in the landing gear for #6 x 1/2” [12.7mm] flat head screws.

❏ ❏ R13. Now is a convenient time to plan your air line routing. If you haven't already done so, drill or cut holes in the ribs to guide the air lines. A 5/32" [4mm] brass tube sharpened at one end makes a great *drill* to cut holes through the ribs. Do not install the air lines at this time.

Perform steps F14-F16 if you are installing fixed landing gear.
**NOTE:** The fixed landing gear rail and rib doublers are shown on the **left** wing plan.

❏ ❏ F14. Use 30-minute epoxy to glue the 1/2" x 3/4" x 6-3/4" [12.7 x 19 x 172mm] grooved hardwood **landing gear rail** in the notches of the ribs and rib doublers with the groove visible, as shown in the photo. At the same time, glue the 3/4" x 3/4" x 1" [19 x 19 x 25.4mm] maple **torque block** to rib doubler W4G and the top of the landing gear rail.

❏ ❏ F15. Cut the 1/4" x 1/2" x 9" [6.4 x 12.7 x 229mm] plywood **flap servo hatch forward rail** to a length of 3-1/16" [77.8mm]. Glue it into the notches of ribs W6 and W7.




❏ ❏ F16. After the epoxy on the landing gear rail has fully cured, drill a 3/16" [4.8mm] hole through the landing gear rail and the torque block. The center of the hole should be 3/32" [2.4mm] from the plywood rib doubler W4G. Make sure you hold the drill perpendicular to the bottom of the landing gear rail.

❏ ❏ 17. **Optional:** From the plan cut off the two paper tube strips along the dashed lines. Roll these strips and cut them to the lengths needed. They are used to allow easy routing of the servo wires and their extensions. For fixed gear the tubes go from R2 to R9. For retracts they go from R7 to R9. For retract installation, the wires can easily be fished through the small holes in R4, R5 and R6.

❏ ❏ 18. Cut three 3-1/16" [77.8mm] long **servo hatch cover rails** from the 1/4" x 3/8" x 24" [ 6.4 x 9.6 x 610mm] basswood stick (the same stick you used for the landing gear rail support if you are building retracts). Glue the rails in the notches of the ribs where shown on the plan.


❏ ❏ 19. Cut three 1-1/2" [38mm] long **flap hinge blocks** from the shaped 5/8" x 9" [15.9 x 229mm] balsa stock. Bevel one end of each hinge block so they fit the ribs, then glue them in the location shown on the plan. **See the cross section** on the wing plan to be sure you know the position and orientation of the blocks.

❏ ❏ 20. Cut five 1" [25.4mm] long **aileron hinge blocks** from a 1/2" x 1/2" x 6" [12.7 x 12.7 x 152mm] balsa stick. Cut one 2-7/8" [73mm] long hinge block from the 5/8" x 1/2" x 6" [15.9 x 12.7 x 152mm] balsa stick. The long hinge block is the one closest to the root end of the aileron and is the base for the aileron control horn.

❏ ❏ 21. Bevel the ends of all the aileron hinge blocks so they fit against the ribs as shown on the plan. Bevel the **tops** of the hinge blocks that fit in the aileron so they match the angle of the ribs. Glue the hinge blocks in the wing and aileron.

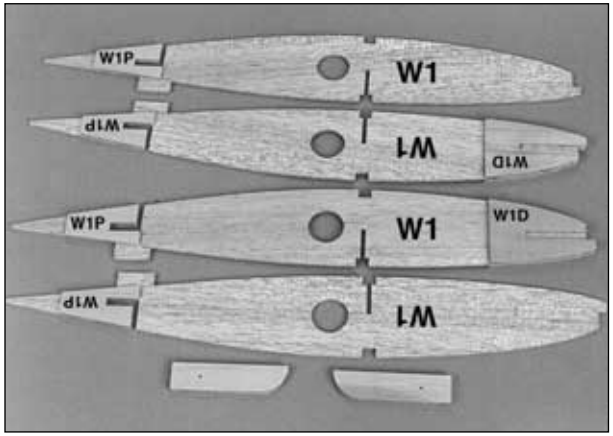
❏ ❏ 22. Use a bar sander and 80-grit sandpaper to sand the sheeting, spars and LE so they are flush with root rib W2 and tip rib W14.

❏ ❏ 23. Mark the locations of the aileron hinge slots on the outer wing TE and the aileron LE, so you will know where to cut the hinge slots after the wing and aileron are sheeted. Mark the location of the flap hinge blocks the same way.

❏ 24. Return to step 1 on page 22 and finish the left wing panel.

## BUILD THE CENTER SECTION

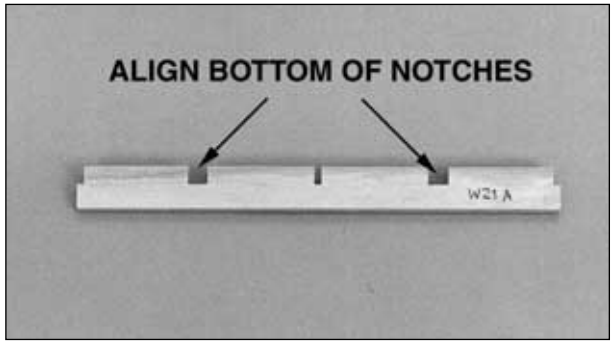
❏ 1. Position the center section wing plan (which is attached to the right wing plan) over your building board and cover the plan with Plan Protector or waxed paper.




❏ 2. Prepare two **W1** ribs as follows: Use thick or medium CA to glue two die-cut 1/8" [3.2mm] plywood **dowel rib doublers W1D** and one **bolt plate rib doubler W1P** to the sides of each die-cut 1/8" [3.2mm] balsa **ribs W1** as shown on the plan. Pay careful attention to which sides of the ribs the doublers are glued.

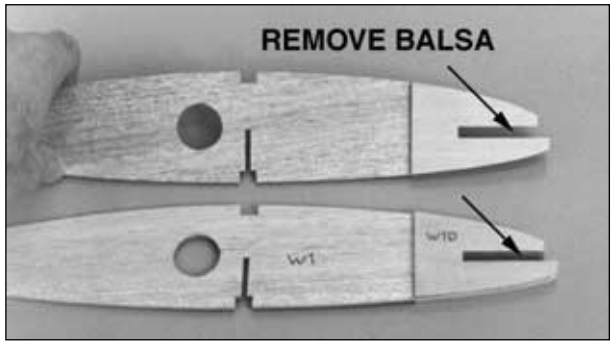
❏ 3. Prepare two additional **W1** ribs as follows: Use thick or medium CA to glue one die-cut 1/8" [3.2mm] plywood **bolt plate rib doubler W1P** to the sides of each die-cut 1/8" [3.2mm] balsa **ribs W1** as shown on the plan. Pay careful attention to which sides of the ribs the doublers are glued.

❏ 4. Glue two sets of die-cut 1/8" [3.2mm] plywood **wing bolt plates** together to make two 1/4" [6.4mm] plates.

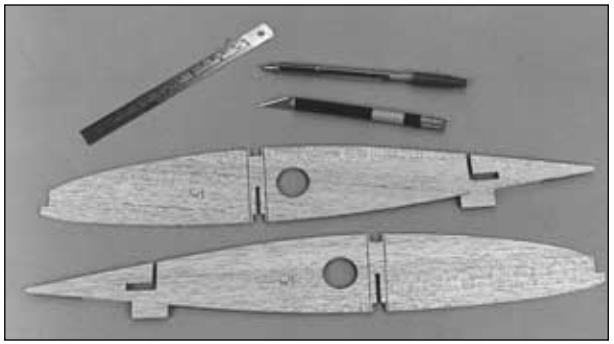



❏ 5. Glue the die-cut 1/8" [3.2mm] plywood **leading edge doubler (W21)** to the die-cut 1/8" [3.2mm] plywood **center leading edge (W21A)** so the **bottoms** of the **notches** align. W21A is narrower than W21 so the top and bottom edges will be offset 1/16" [1.6mm].

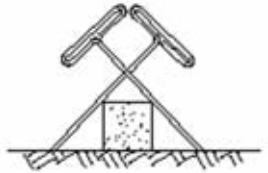
❏ 6. Test fit the wing bolt plate in the notches of the ribs where shown on the plan. Adjust the notches if necessary so the bolt plates fit.




❏ 7. Remove the balsa from both W1 ribs between the notches of the dowel doublers.



❏ 8. With a straightedge and a ballpoint pen mark two vertical lines 1/16" [1.6mm] ahead of and behind the spar notches on the **outside** of both of the W1 ribs, that have only the W1P doublers glued to them. Use a sharp hobby knife to cut halfway through the balsa along the lines. This section of balsa will be removed to accommodate the spar joiners when it is time to join the wing.




❏ 9. Cut one 11" [279mm] long piece for the **bottom center spar** and one 9-1/4" [235mm] long piece for the **top center spar** from a 1/4" x 3/8" x 24" [6.4 x 9.6 x 610mm] basswood stick. Pin only the ends of the 11" bottom center spar to your building board over its location on the plan. Do not stick the T-pins through the basswood spar but insert them in a crossed fashion over the spar to hold it to your building board.

*Now for the fun part. . .*

❏ 10. Fit the ribs onto the die-cut 1/8" [3.2mm] plywood **center spar web W19**. Make sure the ribs go all the way down in the center spar web. Deepen the notches (in the ribs or the spar web) if necessary. Fit the assembly onto the bottom spar.

❏ 11. Join the die-cut 1/8" [3.2mm] plywood **aft center spar W20**, the center leading edge assembly (W21 and W21A), the 9" top spar, and the wing bolt plates to the ribs. Make sure the ribs align with the plan.

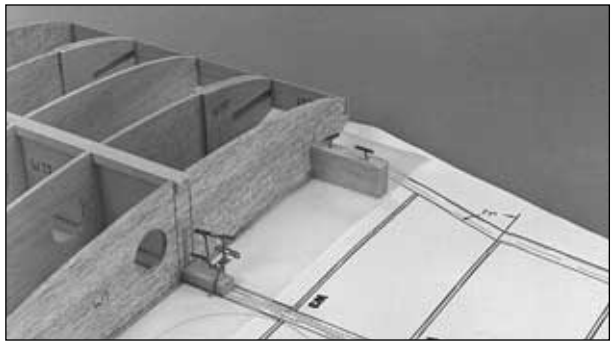
❏ 12. Pin small blocks of leftover balsa to the plan next to the W1 ribs, aligning them over the plan, and place weights on top of the ribs and spars to hold the jig tabs to the building board. Use a small square to make sure the W1 ribs are vertical.

❏ 13. Use medium or thin CA to glue all joints **with the exception of the top spar**. Do not use large amounts of CA and do not build up large fillets. This will make it easier to join other parts to the assembly. You will be reminded to reinforce all glue joints later.

❏ 14. Remove the top spar and apply medium CA to the spar notches in the ribs and to the top of the spar web. Put the top spar back in place and hold it in position until the CA cures.

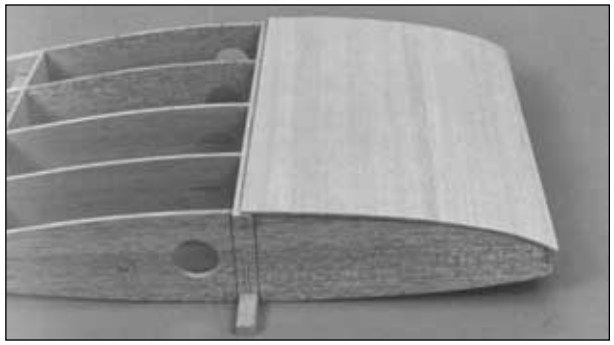
***SHEET THE TOP CENTER SECTION***

❏ 1. Sand the top of the leading edge, spars and ribs so they blend together. You may remove the center section from your building board if necessary, but pin it back down after you're done sanding.



❏ 2. Make sure the center section accurately aligns with the plan. If necessary, pin two more balsa blocks to the building board near the fronts of the ribs.

❏ 3. Use two 3/32" x 3" x 30" [2.4 x 76.2 x 762mm] balsa sheets to make one 7" x 9" [177.8 x 228.6mm] **forward top center section wing skin** and one 11" x 9" [279.4 x 228.6mm] **aft top center section wing skin**.



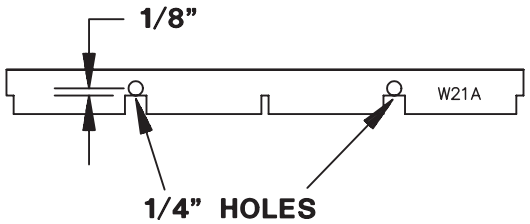
❏ 4. Sand the sheets so they are flat and smooth. Trim the forward skin so the aft edge aligns with the center of the top spar and the front extends past the LE (W21 and W21A) by approximately 1/8" [3.2mm]. If you find it necessary, wet the top of the forward top skin first, before gluing it to the center section of the wing. *You're an expert at sheeting now, so this should be easy.*

❏ 5. Trim the aft skin so the front edge joins the forward skin and the aft edge extends past the ends of the ribs 1/2" [12.7mm]. Trim the ends of the aft top skin so it extends past the W1 ribs by approximately 1/16" [1.6mm] to allow for sanding later.

❏ 6. Glue the aft skin to the center section.

❏ 7. After the glue dries, remove the center section from the plan. Trim, then sand the bottom spar and the top sheeting flush with the end ribs. **Do not** sand off the tabs on the ends of the aft spar W20. They will key into ribs W2 and align the outer panels with the center section.

❏ 8. Remove the jig tabs and sand the bottoms of the ribs and spars so they all blend together. Bevel the trailing edge of the top sheeting the same way you did for the outer panels.




❏ 9. Drill 1/4" [6.4mm] holes through the LE of the center section (W21 and W21A) where shown on the sketch. Slightly round one end of both 1/4" x 2-1/2" [6.4 x 63.5mm] **wing dowels**. Test fit, then glue the wing dowels into the center section with 30-minute epoxy. The rounded end should point out the front of the LE.

❏ 10. Reinforce all glue joints that don't look strong. Do not build up any glue fillets where the dihedral braces will be fitted.

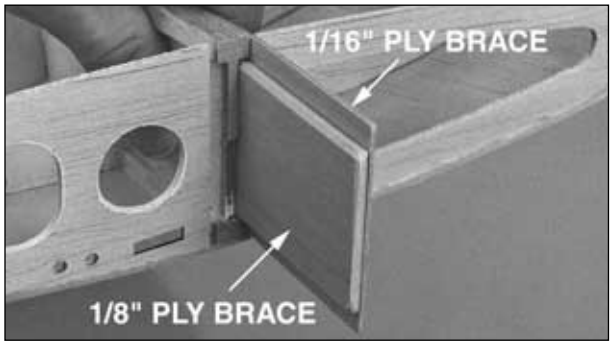
**T-34 Fact:** The service life of the T-34A was very short in the USAF. The aircraft was used as a primary trainer from 1953 until 1961. The USAF then shifted to the Cessna T-37 and Northrop T-38 in an all jet training system.

## PREPARE THE BOTTOM OF THE WING FOR SHEETING

❏ 1. If you are installing retracts, build a *partition* on both wing panels from leftover 3/32" [2.4mm] balsa to seal the wing aft of the wheel well compartment. Fuelproof the *nooks and crannies* of the wheel well inside the wing that you will not be able to reach after the bottom sheeting is in place. You can see the partitions in the following photo.


❏ ❏ 2. Remember where you cut **partway** through ribs W2 on both wing panels 1/16" [1.6mm] ahead of and behind the spar notches? Use a hobby knife or a fine razor saw to cut the rest of the way through rib W2 on the right wing panel and remove the balsa within the area you cut.

❏ ❏ 3. Cut away the portion of balsa on rib W1 between the spars on the right side of the **center section** the same way.




❏ ❏ 4. Test fit the die-cut 1/16" [1.6mm] plywood **dihedral braces W23** and the die-cut 1/8" [3.2mm] plywood **dihedral braces W22** in the outer wing panel. If necessary chamfer the corners of the braces to accommodate small glue fillets in the wing. **Note:** Make certain you fit the braces *right side up* the same as the dihedral of wing.

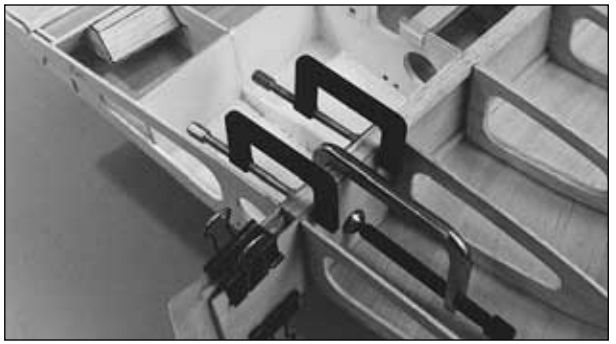
❏ ❏ 5. Temporarily join the center section to the right wing panel with the dihedral braces to make sure everything fits. Make adjustments where needed so the center section fully contacts the right panel. Separate the wing sections and remove the dihedral braces.

*Read the following five steps before you actually use any glue so you understand the procedure and can gather the items you will need.*

❏ ❏ 6. Mix a batch of 45- or 30-minute epoxy. Spread a film of epoxy in the outer wing panel everywhere it contacts the dihedral braces. Spread a film of epoxy on the 1/8" [3.2mm] and 1/16" [1.6mm] ply dihedral braces **except where they will contact the center section** wing panel. Fit the dihedral braces into the right wing panel. **Make certain you fit the braces *right side up*.**

❏ ❏ 7. Remove excess epoxy from the parts of the dihedral braces that will contact the **center section**.

❏ ❏ 8. Set the dihedral braces by **temporarily** joining the center section to the right wing panel. Clamp the dihedral braces **to the right wing panel only**. Carefully remove the center section and wipe away excess epoxy with a paper towel.

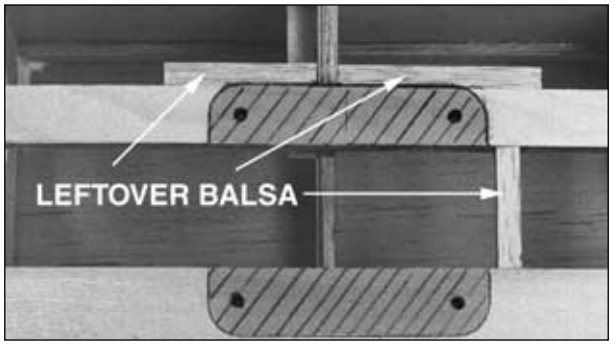


❏ ❏ 9. Insert two approximately 2" x 2" [50.8mm] pieces of waxed paper between the dihedral braces where they protrude from the right panel, then insert a piece of 1/8" [3.2mm] balsa between the two pieces of waxed paper. Clamp the outer 1/16" [1.6mm] ply dihedral braces to the inner 1/8" [3.2mm] ply dihedral braces.

❏ ❏ 10. Use small balsa sticks and small pieces of paper towel to wipe away all excess epoxy so it will not interfere with the center section when it is time to join it to the right wing panel.

❏ ❏ 11. After the epoxy cures, glue the inside of W2 to the 1/16" [1.6mm] dihedral braces.

❏ 12. Return to step 2 and glue the dihedral braces in the left wing panel.




❏ 13. If you're installing retracts, glue leftover 3/16" or 1/4" [4.8 or 6.4mm] balsa to the front of the forward landing gear rail and between the rails to support the sheeting. Use a ballpoint pen or a pencil

(not a felt-tip pen) to trace the outline of the landing gear onto the rails so you know where **not** to apply glue when you glue on the bottom sheeting. Later, the sheeting over this area will be removed to accommodate the landing gear mounts.

❏ 14. Cut holes and slots in the W1's on the ends of the center section to match the holes for the servo leads and retract air lines in the W2's of the outer panels. Cut the holes slightly oversize just in case they don't align perfectly.

*We've temporarily joined the wing panels and installed the air lines and servo leads in the right wing panel to mock-up the installation to give you an idea of how to route them later. If you wish, you could test your installation now to make sure your setup will work.*

❏ 15. Glue a piece of leftover 3/32" [3.2mm] balsa to the center section sheeting aft of the spar (note the grain direction). Cut a 3/4" [19mm] hole through the sheeting at this location for the servo cords and air lines to exit the wing into the fuse.

❏ 16. Separate the wing panels and remove the servo cords and air lines but leave the tip light wires in both outer wing panels.

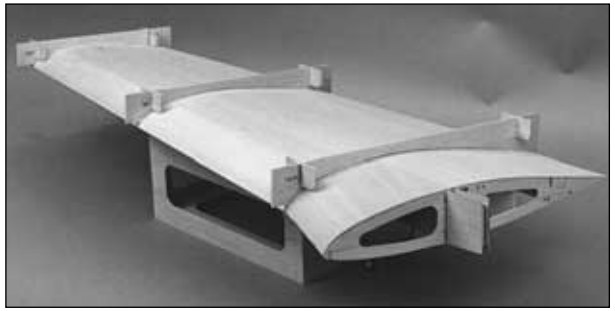
❏ 17. Sand the bottom of the outer wing panels with a bar sander and 150-grit sandpaper so the spars, landing gear and servo rails blend to the shape of the ribs.

## SHEET THE WING PANEL BOTTOMS

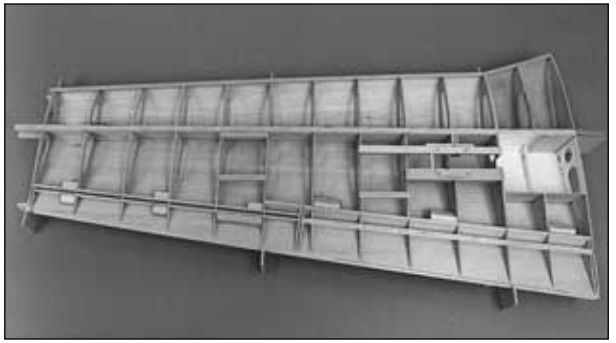
❏ 1. If you have not already done so, make the forward and aft bottom wing skins the same way you made the top wing skins on page 18.

❏ ❏ 2. Use a ballpoint pen to mark the top sheeting over ribs W14, W9 and W4 at the leading and trailing edges. Check all glue joints and reinforce as needed.

❏ ❏ 3. Test fit the die-cut 1/8" [3.2mm] balsa **wing cradles W14C, W9C** and **W4C** on the top of the wing, aligning them with the marks you made. Sand away any slivers or slight die-cutting irregularities until the cradles match the contour of the wing.



❏ ❏ 4. Glue the die-cut 1/8" [3.2mm] balsa **feet** to the cradles. Apply one drop of thick or medium CA near the front and rear of each cradle and tack glue them to the top wing sheeting in their proper locations. You only need enough glue to hold the cradles to the wing so they won't fall off when you turn it upside down.



❏ ❏ 5. Place the wing on your workbench so it is resting on the cradles. Fit the bottom sheeting to the wing. Trim the *stoppers* on the cradles so the trailing edge of the bottom sheeting aligns with the trailing edge of the top sheeting. Trim the front edge of the sheeting so it *ends* at the center of the spar (the same way as the top sheeting).

❏ ❏ 6. Glue the aft bottom skin to the wing. Use T-pins or weights to hold the skin in place until the glue dries. **Do Not** glue the skin to the servo hatch rails or where the retracts will be mounted. **Caution:** Do not add too much weight because this may bow the wing.

❏ ❏ 7. Test fit, trim, then glue the **forward outer skin** to the wing panel. Just the same as the top forward outer skin, the wood grain should be parallel to the **leading edge** of the wing panel.

❏ ❏ 8. Use the remainder of the 3/32" x 6" x 30" [2.4 x 152.4 x 762mm] balsa sheet you used for the forward inner top skin to make a **forward inner bottom skin**. Test fit, then glue the skin to the wing panel.

❏ ❏ 9. After the glue dries remove any T-pins you may have used and take the weights off the wing panel. Trim all the sheeting so it is even with the tip and root ribs and the leading and trailing edges of the wing.

*Perform the following step only if you are installing fixed landing gear.*

❏ ❏ F10. If you are installing fixed landing gear, use the plan as a guide to poke holes through the wing skin with a pin until you locate the groove in the landing gear rail. Remove a strip of balsa from the groove just long enough to accept the landing gear wire. Use the **nylon straps** as a template to mark holes in the sheeting for the #2 x 3/8" [9.6mm] screws. Drill 1/16" [1.6mm] holes at the marks and test fit the landing gear to the wing with the straps and screws as shown on the plan. Remove the landing gear.

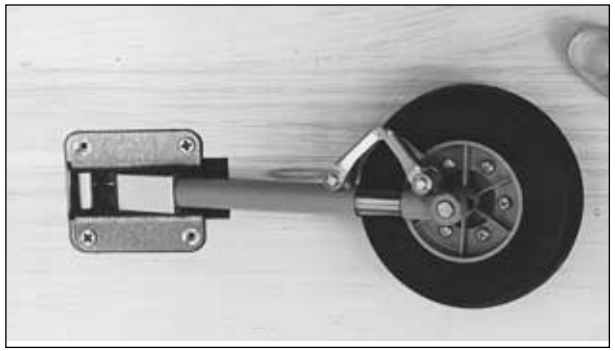
**Note:** The nylon straps should be inset into the balsa skin so that they are secured to the basswood landing rail.

❏ 11. Set the right wing panel aside and sheet the bottom of the left wing panel the same way.

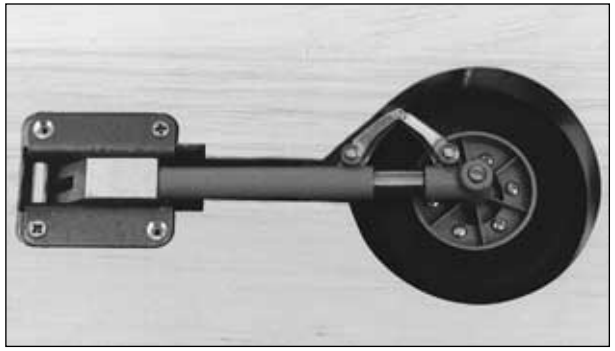
**T-34 Fact:** The production T-34A was powered by a 225 hp Continental O-470-13 engine. The aircraft was fitted with either an eighty-four or eighty-eight inch diameter, hydraulically operated propeller. The aircraft had tricycle retractable landing gear that was electrically operated. There were two main landing gear doors. The inner main gear door opened during gear transition and then closed when the gear was up or down.

## CUT OUT THE WHEEL WELLS

Perform these steps only if you are installing retracts.



❏ ❏ R1. Start by cutting and removing just enough sheeting to mount the landing gear to the rails.



❏ ❏ R2. Retract the gear so that the wheel lays on the wing sheeting and draw a rough outline of the wheel onto the sheeting. Cut the sheeting within the outline. Retract the wheel again and draw a more accurate outline. Cut the sheeting until the wheel fully retracts into the wheel well, leaving at least 1/8" [3.2mm] clearance between the wheel and the sheeting (in case you *tweak* your landing gear on one of those bumpy landings).

❏ ❏ R3. Glue leftover 1/16" [1.6mm] balsa sheeting to the **inside** of the bottom sheeting around the wheel well cutout with the grain direction opposite that of the wing sheeting. This will reinforce the sheeting around the wheel well cutout.

❏ ❏ R4. Brush another coat of fuelproof paint inside the wheel wells while they are still easy to reach with a paint brush.

## BUILD THE WING TIPS

**Refer to this photo for the following steps.**

❏ 1. Locate the 1-1/2" x 1-9/16" x 9" [38 x 39.7 x 228.6mm] shaped balsa **wing tips**. Check the shape of the tips against the plan and sand as needed to fit.

❏ ❏ 2. Glue the wing tip to the wing. Keep the tip centered on the wing.

❏ ❏ 3. Use a razor plane or a hobby carving knife, followed by sanding to **carefully** shape the wing tip. Inspect your progress frequently. Use the plan and the above photo as a reference so you know what the curve of the tip should look like.

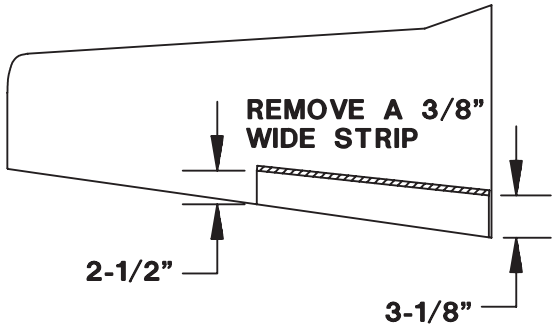
**Note:** When you shape the second wing tip, use the finished tip as a guide to shape the second. This way you can make sure both of the wing tips are identical.

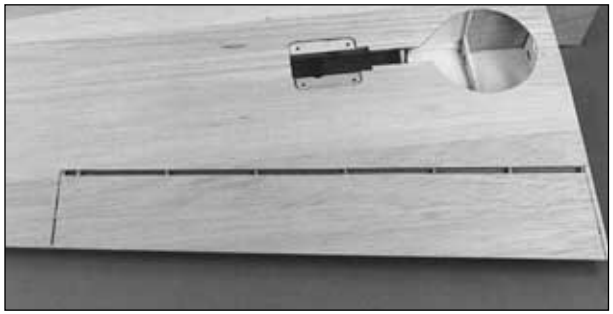
❏ 4. Return to step 2 and build the wing tip on the left wing panel.

## BUILD THE FLAPS

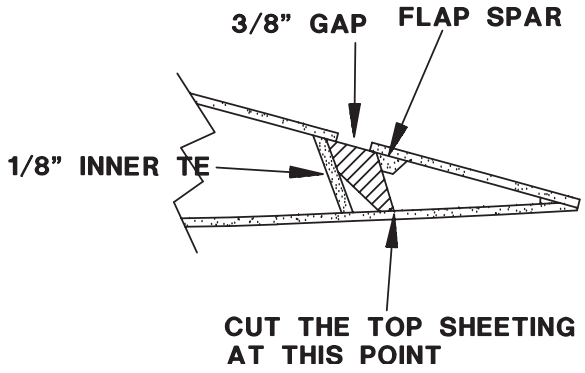
*Skip this section if you are not building flaps.*

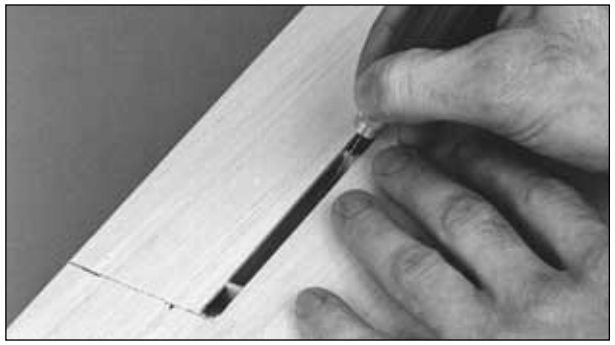
❏ ❏ 1. Use a fine razor saw to cut only the **ends** of the flap from the wing along the holes you poked in the top sheeting.



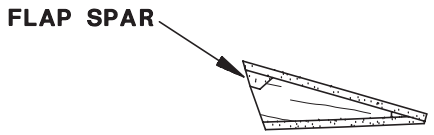



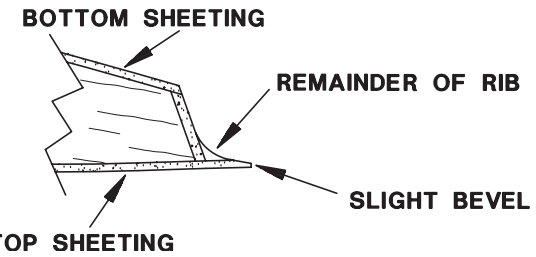
❏ ❏ 2. Use a ballpoint pen to lightly mark the flap on the bottom of the wing as shown in the sketch. Remove the 3/8" [9.5mm] strip of sheeting from the bottom. This will expose the ribs so you know where to cut them to separate the flap from the wing.



❏ ❏ 3. Use a razor saw to cut through the ribs and top sheeting as shown in the sketch.



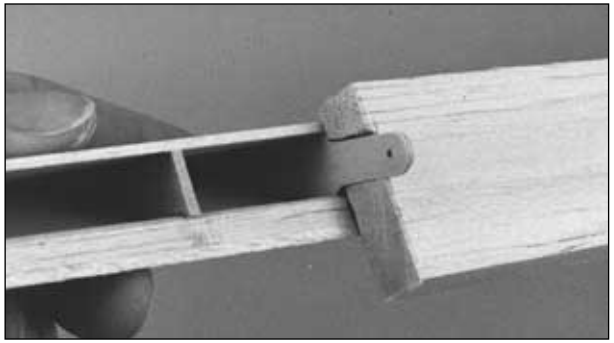




❏ ❏ 4. Trim the TE of the wing in the flap area and the LE of the flap as shown in the sketch. A 3/4" [17.8mm] dowel wrapped with 150-grit sandpaper can be used to round out the rib stubs.

❏ ❏ 5. Cut a hole in the inner wing TE for the flap horn at the location shown on the plan. The hole should be **biased** toward the top of the wing.

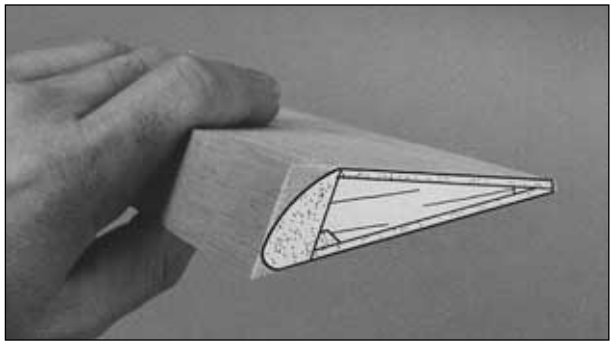
❏ ❏ 6. Place the flap over the plan and mark the location of the die-cut 1/16" [1.6mm] ply **flap horn**. Fit but do not glue the flap horn into the flap.

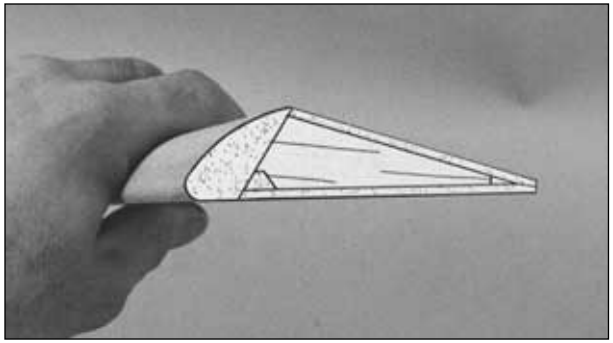
**Note:** Each flap has a different location for the flap horn so make sure you use the correct wing plan for the flap you are working on.



❏ ❏ 7. Cut the 5/8" x 1-3/8" x 18" [15.9 x 34.9 x 457mm] balsa **flap LE** into two pieces that fit on both sides of the flap horn. Cut a 1/16" [1.6mm] notch in the longer LE to accommodate the flap horn. Glue the longer LE to the flap so the top edge is flush with the top of the flap.

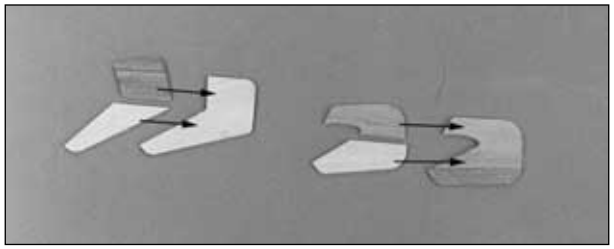
❏ ❏ 8. Remove the flap horn. **Temporarily tack glue** the short flap LE to the flap with **a few drops** of thick or medium CA. Sand the ends of the flap LE so they are even with the ends of the flap. Carve and sand the top and bottom of the flap LE flush with the top and bottom of the flap.

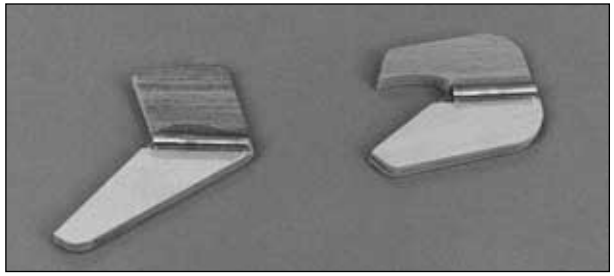




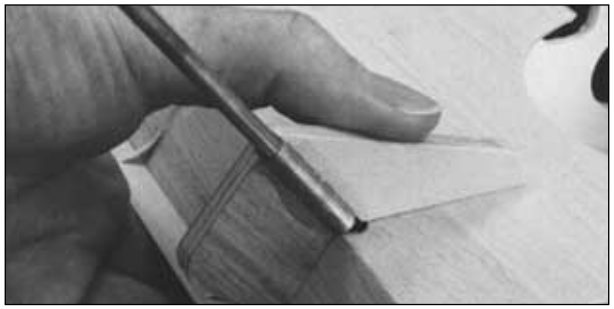
❏ ❏ 9. Cut the **flap root and tip end templates** from the plan. Glue them to the ends of the flap with rubber cement or spray adhesive. Use the templates as a guide to shape the flap LE with a razor plane or a hobby carving knife followed by a bar sander.

❏ ❏ 10. Drill a 1/16" [1.6mm] hole through the punch mark in the front of the flap horn for the clevis. Add a few drops of thin CA to the hole. After the CA hardens redrill the hole. Remove the flap LE you tack glued on. Insert the flap horn into the flap and securely glue it in place. Permanently glue the flap LE to the flap.



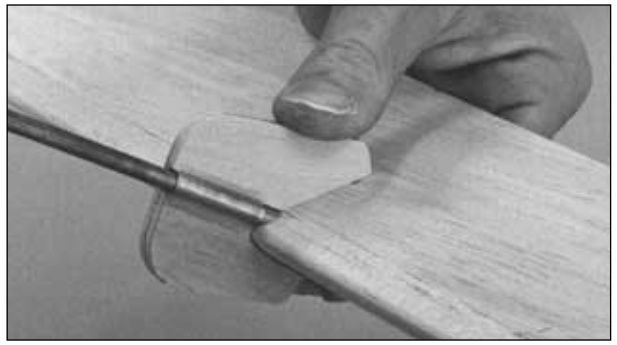


❏ ❏ 11. Assemble the die-cut 1/8" [3.2mm] plywood **flap hinge drill guides** by gluing the pieces together as shown. **Optional:** Glue a piece of 7/32" [5.6mm] brass tubing (3/16" I.D. [4.8mm]) to the hinge drill guides to guide your drill even better.

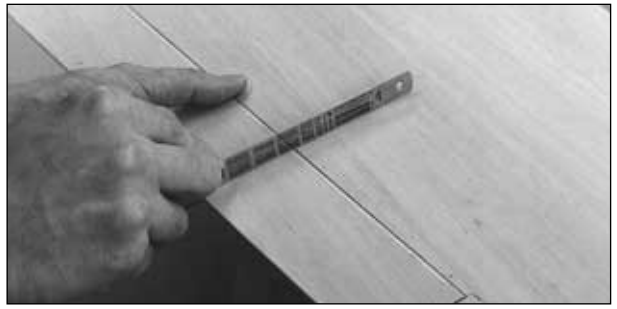


❏ ❏ 12. Position the ***wing*** **flap hinge drill guide** on the wing over each hinge block (you marked them before you sheeted the bottom of the wing) and drill 3/16" [4.8mm] holes 1-1/8" [28.6mm] deep for the Hinge Points. **Hint:** Instead of using a drill bit, use a piece of 3/16" brass tube sharpened at one end to drill holes with clean edges.

❏ ❏ 13. Insert three #309 Robart Super Hinge Points into the holes in the wing but do not glue them in. Fit the flap to the wing and mark the locations of the hinge points on the flap.



❏ ❏ 14. Use the ***flap*** **hinge drill guide** to drill holes in the flap the same way you did for the wing.

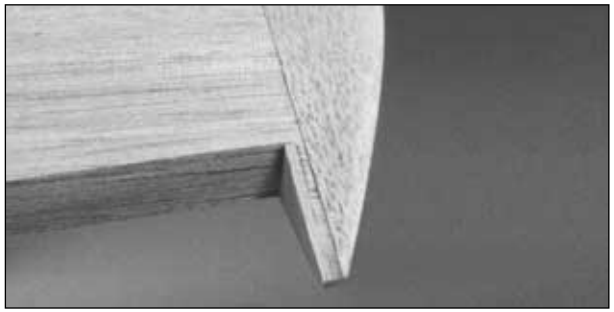


❏ ❏ 15. Cut 1/4" [6.4mm] off the end of the outermost hinge point that fits into the flap. Test fit the flaps to the wing with the hinge points. Adjust the position (depth) of the hinges until the flap aligns with the wing the same way it was before you cut it loose. Make adjustments until the flap fits the wing and freely moves about its range of motion. Strive for a good fit where the top of the flap meets the top of the wing.

❏ 16. Return to step 1 on page 30 and mount the other flap to the wing the same way.

## BUILD THE AILERONS

❏ ❏ 1. If you have built flaps, remove them from the right wing panel. Use a razor saw to separate the aileron from the wing by cutting between the LE of the aileron and the TE of the wing. Refer to the plan to find the location of this gap and poke a pin through the sheeting to verify you have found the gap. Use the razor saw to cut the ends of the aileron from the wing along the holes you poked in the top sheeting.

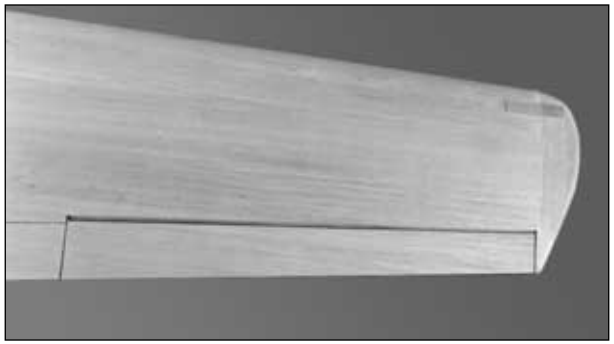


❏ ❏ 2. Sand the sheeting and the *rib stubs* on the wing even with the TE. Glue a piece of leftover 3/32" [2.4mm] balsa to the wing tip rib. Sand it to the shape of the wing.

❏ ❏ 3. Sand the sheeting and the *rib stubs* on the aileron even with the LE and the tips. Glue the die-cut 1/8" [3.2mm] balsa **aileron leading edge (W17A)** to the front of the aileron. Sand the leading edge flush with the ends and top and bottom of the aileron.

❏ ❏ 4. Use the *straightedge and T-pin technique* to mark a centerline on the wing TE and the aileron LE. Cut the hinge slots where shown on the plan. Test fit the aileron to the wing with the hinges. Adjust any hinge slots if necessary so the aileron and wing align. Sand the tip of the aileron so there is about a 1/16" [1.6mm] gap between the end of the aileron and the wing tip.

❏ ❏ 5. Bevel the leading edge of the aileron to a "V" using the centerline as a guide. The bevel must permit the full amount of aileron throw as specified on page 62, plus a bit extra to prevent servo binding.



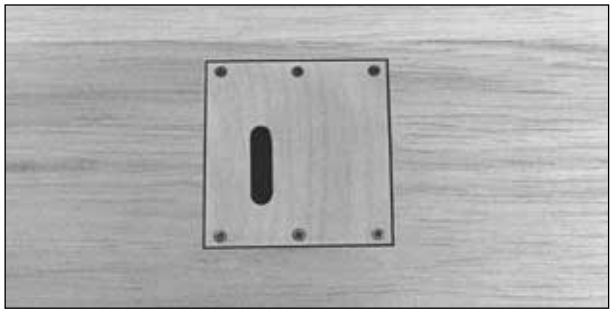
❏ ❏ 6. Replace the flap onto the wing. Adjust the root of the aileron and the tip of the flap so there is approximately a 3/32" [2.4mm] gap between them.

❏ 7. Return to the first step and build the aileron on the left wing panel the same way.

## MOUNT THE FLAP AND AILERON SERVOS

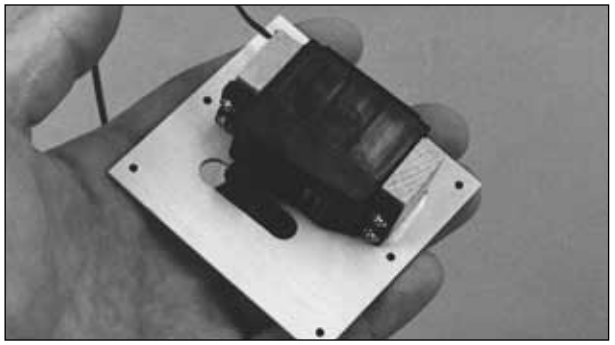
❏ ❏ 1. Cut the openings in the bottom of the wing sheeting for the die-cut 1/16" [1.6mm] plywood **aileron and flap servo hatch covers** (if you're building flaps). Start by cutting a smaller opening at the location indicated on the plan. Carefully enlarge the hatch openings using a fresh #11 blade and a straightedge until the hatch covers fit.
**Hint:** As you *zero-in* on the final shape of the hatch openings, use the hatch covers themselves as a template to cut the openings.

❏ ❏ 2. Drill 1/16" [1.6mm] holes through the punch marks in the servo hatch covers. Place the hatch covers on the rails in the hatches and drill 1/16" [1.6mm] holes through the hatch covers into the rails.



❏ ❏ 3. Enlarge the holes **in the hatch covers only** with a 3/32" [2.4mm] drill bit. *Countersink* the holes for the #2 x 3/8" [9.5mm] flat head screws with a countersink or other pointed tool. Test fit the hatch covers to the rails with the screws. If necessary, remove the hatch covers and sand the sides of the hatch covers so they align with the edges of the hatch openings. Remove the hatch and harden the screw holes with some thin CA. **Note:** Though the hatch covers are 1/16" [1.6mm] thick and the wing sheeting is 3/32" [2.4mm] thick, by the time you sand the wing sheeting smooth it will be the same height as the hatch covers. If not, you can raise the hatch covers by placing thin shims made from 1/64" [0.4mm] plywood or thin cardstock on top of the rails.

**Use this photo for the next two steps.**



❏ ❏ 4. Mount each servo to two 5/16" x 3/4" x 7/8" [7.9 x 19 x 22.2mm] **servo mount blocks** with the screws, grommets and eyelets included with your servos. Remove the screws, harden the screw holes with some thin CA and then reinstall the servo. Be sure that the servo is aligned so that the servo arm is in the center of the cutout.

❏ ❏ 5. Use 30-minute epoxy to glue the servo mount blocks, with the servo attached, to the servo hatch covers as shown on the plan. Roughen the hatches with sandpaper where the blocks will be glued so the glue will adhere better.

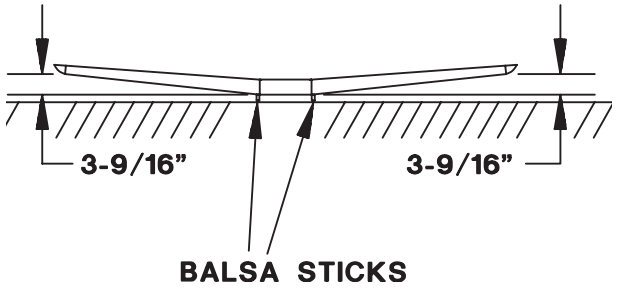
**Note:** You can increase the strength of this joint by drilling a few shallow 1/16" [1.6mm] holes into the servo mount blocks. This will create epoxy pins that extend into the blocks.

❏ ❏ 6. Drill a 1/16" [1.6mm] hole through the hatch covers into each servo mount block. Countersink the holes and install a #2 x 3/8" [9.5mm] flat head sheet metal screw. Test fit the servo hatches in the wing and screw them down with the hatch cover screws.

❏ 7. Return to the first step and mount the flap and aileron servos in the other wing panel.

## JOIN THE WING PANELS

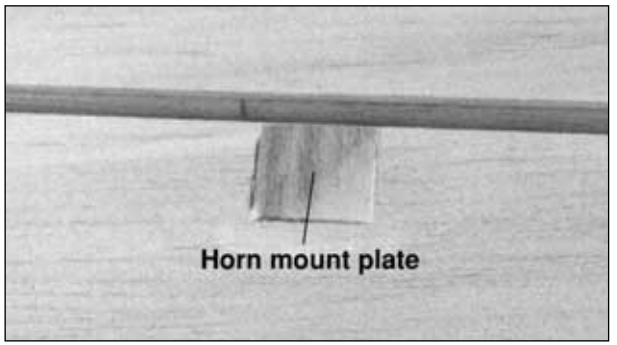

❏ 1. Remove the flaps. Test fit both outer panels to the center section. Make small adjustments if necessary to minimize any gaps you see. *Test fit* your clamps to make sure you have enough of them and to make sure you know where you are going to place the clamps when you actually glue the wing together.



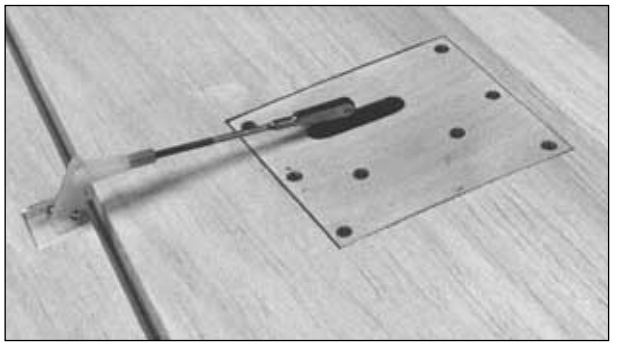

❏ 2. **Optional:** The dihedral braces and the *preset* angle of the root ribs on the outer panels will determine the dihedral in the wing. But if you wish to check the dihedral before you permanently glue the wings together, clamp the wing together, raise the center section off your workbench with balsa sticks of equal size (so the wing is not resting on the clamps) and measure the height of both wing tips. The height of **both** tips (measured under the bottom of the spar at tip rib W14) should be 3-9/16" [90.5mm] (not including the balsa sticks). If the measured dihedral of both wing tips is within a range of 3-3/8" to 3-3/4" [85.7 to 95.3mm], the dihedral is okay. It is important that both sides are the same. Make adjustments as needed.

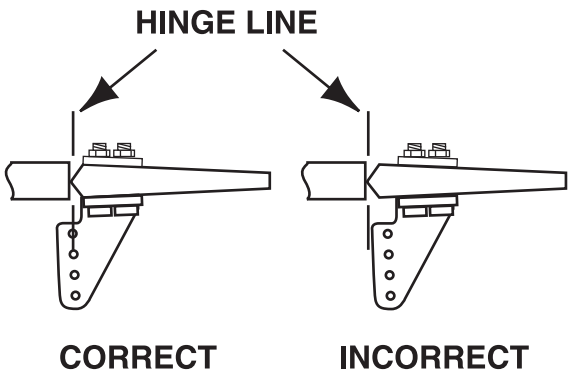
❏ 3. Mix a batch of 45 or 30-minute epoxy to join the wing panels to the center section. Apply epoxy to all the mating surfaces of the end ribs, spars, and dihedral braces. If you have installed the wires for the wing tip lighting, pull the wires through the root ribs so you can route them into the center section. Join the outer panels to the center section and position your clamps. Wipe away excess epoxy with a paper towel before it cures and do not disturb the wing until the epoxy cures.

## MAKE THE FLAP & AILERON PUSHRODS




❏ ❏ 1. Cut a 1/8" [3.2mm] deep notch in the aileron for the die-cut 1/8" [3.2mm] plywood **aileron horn mounting plate** where shown on the plan. Glue the horn mounting plate to the aileron and sand it to match the leading edge.





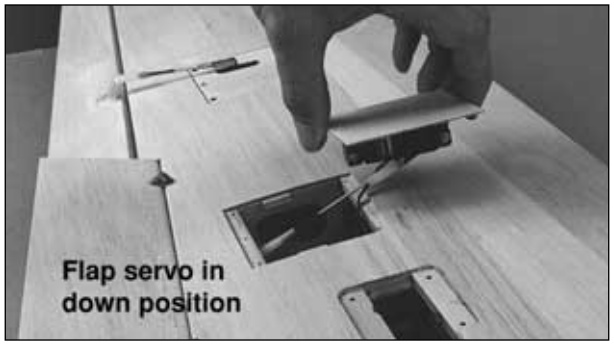

❏ ❏ 2. Make the aileron pushrods from a .074" x 4" [1.9 x 101.6mm] **threaded one end rod** with a **nylon clevis**

and a **solder clevis**. We recommend silver solder for the solder clevis (see the hot tip on soldering below). Drill 1/16" [1.6mm] holes in the aileron horn mounting plate for the control horn (see previous sketch for correct alignment). Be sure to align the horn with the servo arm. Add a few drops of thin CA to the holes and allow to harden. Mount a **control** horn to the aileron with two #2 x 3/8" [9.5mm] screws and hook up the servo with the pushrod.


### SILVER SOLDERING

Use this process when soldering.

A. Thoroughly clean the parts to be soldered with alcohol or other solvent.
B. Roughen the areas to be soldered with fine sandpaper. Clean again.
C. Apply soldering flux or soldering acid to both parts.
D. *Tin* the joining areas of both parts (heat the part and coat it with a thin coat of solder). Apply more soldering flux.
E. Join the parts as you apply heat. Apply more solder and make sure it flows into the joint.
F. Do not move the parts until the solder has solidified.
G. Test the joint by pulling hard.
H. Remove excess flux with alcohol or other solvent. Inspect the joint. A secure solder joint has a shiny appearance. If the solder is rough appearing or not shiny, reheat and allow to cool.
I. Coat the parts with a thin film of oil.




❏ ❏ 3. Thread another **nylon clevis** onto the end of another .074" x 4" [1.9 x 101.6mm] **threaded end wire**. Bend and cut the wire to the length shown on the wing plan for the **right** flap pushrod. Enlarge the holes in your flap servo horns with a hobby knife (or a #48 drill for perfection) and connect the flap pushrod to the servo horn using a **nylon FasLink™**. Rotate the flap servo arm to the *down* position and set the flap hatch cover (with the flap servo and pushrod connected) over the flap hatch and guide the pushrod out of the hole in the TE.

❏ ❏ 4. Temporarily connect the clevis to the flap horn to see if the pushrod is approximately the correct length.

❏ 5. Connect the other aileron and flap pushrod the same way. Make final adjustments to the lengths of the pushrods when you set up your radio.

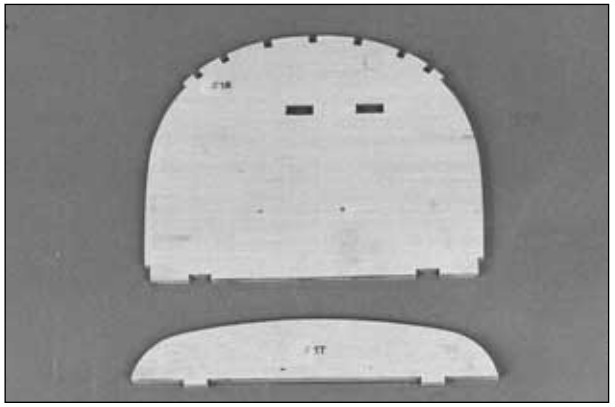
*This is as far as we can go with the wing until it is fitted to the fuse. But first, we need a fuse, so...let's build the fuse!*

## BUILD THE FUSELAGE

### PREPARATION

**Note:** The die-cut 1/8" [3.2mm] plywood formers are stamped with only the necessary portion of their name. For example, F-2B is stamped 2B. All die-cut parts are 1/8" [3.2mm] plywood unless they are otherwise noted.

❏ 1. Position the **bottom view** of the fuselage plan over your flat building board. Cover it with Plan Protector or waxed paper. You may cut the bottom view from the rest of the plan.
**Note:** This is a *bottom* view of the fuselage.

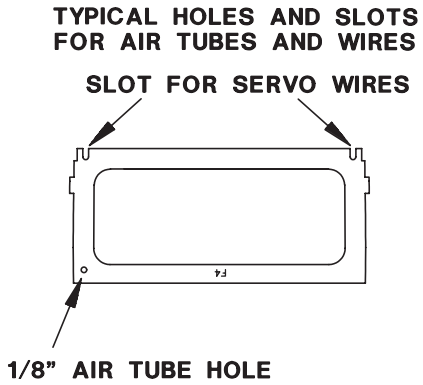


❏ 2. Use 30-minute epoxy to glue two die-cut 1/8" [3.2mm] plywood **F1B's** together and **F1T** to the front of **F1DT** (there are two F1DT's included in the kit but only one is used). Make sure the punch marks are visible on F1T. Clamp the assemblies to a flat table or board or lay weights on them with waxed paper underneath. Inspect the parts closely before the epoxy cures to make sure they remain aligned. Wipe away excess epoxy before it cures. From now on the F1B assembly will be referred to as the ***firewall***.

❏ 3. Drill 1/16" [1.6mm] holes through the punch marks in **F2D** and **F2** that are closest to the bottom of the formers. Glue F2D to the front of F2 with the holes aligned. After the glue dries, drill 5/16" [7.9mm] holes through the punch marks. If you do not have a 5/16" [7.9mm] drill bit you can start with a 1/4" [6.4mm] hole and enlarge it to approximately 5/16" [7.9mm] with a hobby knife or a round wood file. These holes do not have to be *exactly* 5/16" [7.9mm] or perfectly round.

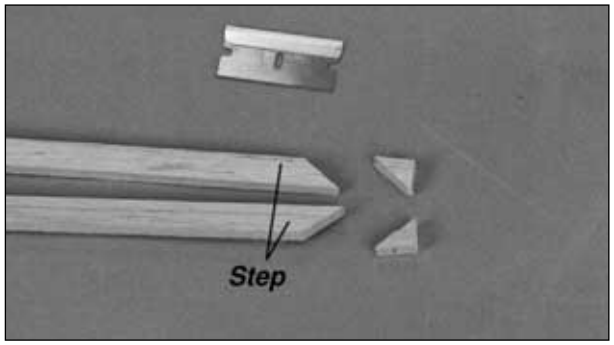
❏ 4. If you're installing retracts, drill 1/8" [3.2mm] holes through the punch marks in the bottom of **F6** for the air tank dowels and through the punch marks in **F2** for the pull/pull nose steering cable guide tubes.

❑ 5. Drill 3/16” [4.8mm] holes through the punch marks in the die-cut 1/8” [3.2mm] plywood formers **F6** through **F10**. When you drill the holes, press down on each former to prevent the wood from splitting when the drill bit goes through. Also drill 3/16” [4.8mm] holes for the antenna tube in formers **F7** through **F11**.




❑ 6. If you plan to install the Top Flite Beechcraft T34B Scale Cockpit Kit (TOPQ8413), drill holes and cut slots in the formers for routing the air lines and servo wires between the fuse sides and the cockpit interior in formers **F3, F4** and **F5**.

## BUILD THE BOTTOM OF THE FUSELAGE



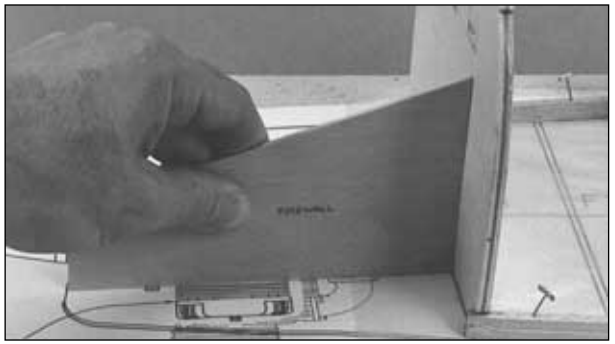

❑ 1. Cut a 45 degree angle at the aft end of two 1/4” x 3/8” x 36” [6.4 x 9.6 x 914mm] stepped balsa **side stringers** so you can *splice* them onto another stringer later.


❑ 2. Pin the stringers over their location on the plan so the ***step*** is on the bottom and faces the outside of the fuselage. The front end of the stringers should align with the **dashed lines** near the front and extend past the firewall by 1/8” [3.2mm]. Use plenty of T-pins to hold the stringers down so they conform to the curvature of the plan.

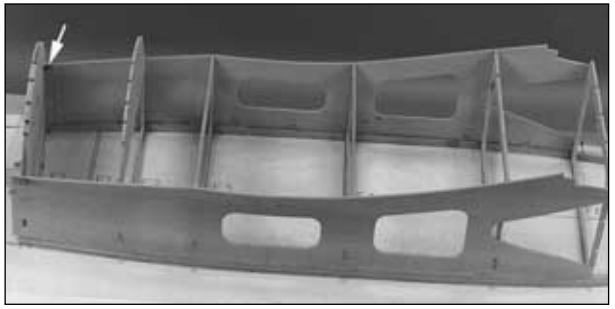
❑ 3. Cut another 1/4” x 3/8” x 36” [6.4 x 9.6 x 914mm] stepped balsa side stringer in half. Bevel one end of both stringers **to match the angles you cut on the stringers already pinned to the plan**. Pin these stringers to the plan and glue them to the front stringers with thin CA. Trim the ends so they extend past former F11 by approximately 1/8” [3.2mm]. You can see the **splice** in the following photo.


❑ 4. Position but do not glue formers **F1** through **F11** on the side stringers so the embossed names on the formers face forward. Adjust the stringers as needed. *Are your 3/16” [4.8mm] pushrod holes drilled?*

❑ 5. Glue formers F2 through F11 to the side stringers, holding them vertical with a 90 degree triangle. Don’t be concerned about formers that are slightly warped or twisted–that is normal. You will be able to straighten these formers when you glue the 3/16” [4.8mm] stringers to them.



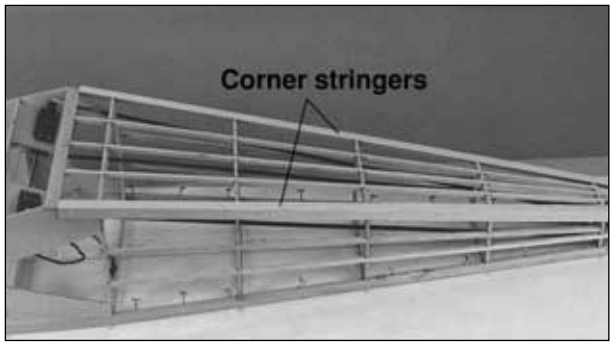
❑ 6. Glue the firewall to the side stringers using the die-cut 1/8” [3.2mm] plywood **firewall angle gauge** to hold the firewall at the correct angle. This will establish the correct down thrust for the engine.

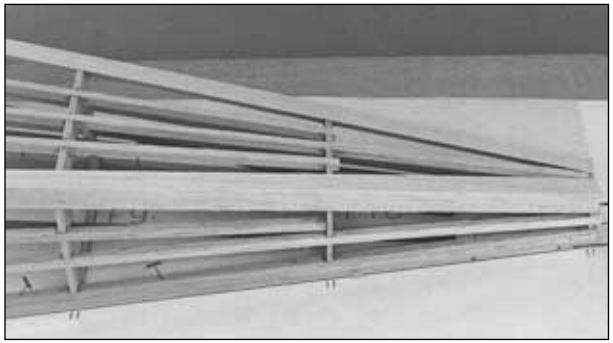


❑ 7. Test fit, then glue the die-cut 1/8” [3.2mm] plywood **fuse side doublers** to formers F2 through F6 only and to the side stringers. **Do not** glue the doublers to the firewall until the next step. You may have to reposition some of your T-pins so they do not interfere with the side doublers. Use your 90 degree triangle to hold the formers vertical while you glue the doublers to them.

❑ 8. Glue the fuse side doublers to the firewall with 30-minute epoxy using the firewall angle gauge to make sure the firewall is set at the correct angle. Use a large C-clamp or masking tape to securely hold the doublers to the firewall until the epoxy fully cures. Cut one 3” [76.2mm] long piece from each of the (2) 1/2” x 36” [12.7 x 914mm] balsa tri-stock pieces. Shape the pieces so they fit between the firewall and the fuse sides on both the left and right sides behind the firewall. Glue them in place with 30-minute epoxy.

❏ 9. Locate two of the 24” [609.6mm] pushrod tubes. Sand the outside of the tubes so glue will stick. Slide them through the holes in formers F6 through F10 so they extend forward of former F6 by [6.4mm] 1/4”. Do not glue the pushrod tubes in place until instructed to do so.



❏ 10. Glue the 3/16” x 1/2” x 10” [4.8 x 12.7 x 254mm] balsa bottom **fuse sheeting support** in position. Sand the ends even with the fuse side doublers. Cut and fit, but **do not glue** the aft bottom fuse stringers from seven 3/16” x 3/16” x 30” [4.8 x 4.8 x 762mm] balsa sticks to fit in the notches of the formers as shown on the plan and in the photo. Save the leftover pieces. The three bottom stringers extend to the sheeting support. You can see the stringers in the photo at step 5 page 37.

❏ 11. Glue the fronts of the three bottom stringers to the sheeting support, then use your 90 degree triangle to hold each former at the correct angle and glue the bottom stringers to the formers.

❏ 12. Glue the 3/16” x 3/16” [4.8mm] side stringers and pushrod guide tubes to the formers.

❏ 13. Cut the bottom **corner stringers** to fit on the formers where shown on the plan from two 1/2” x 36” [12.7 x 914mm] balsa triangle sticks. Glue the corner stringers in place.

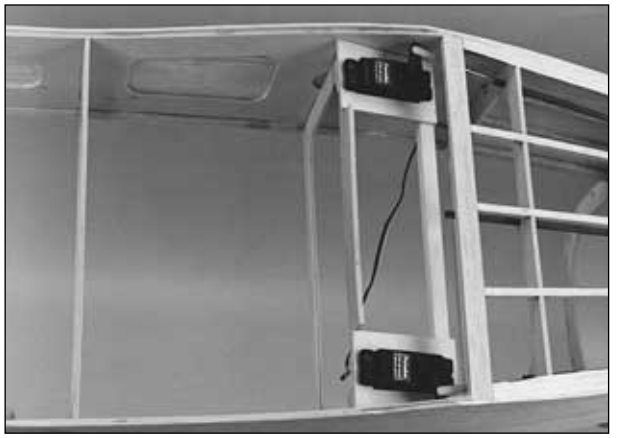
## MOUNT THE SERVOS

❏ 1. **Optional:** For routing your receiver antenna out the back of the fuselage, cut a third 3/16” [4.8mm] outer pushrod guide tube (not included) to a length of 21” [533.4mm]. Roughen the outside of the tube with coarse sandpaper (so glue will stick) and slide the tube through the holes in the bottom of the formers until the front extends past former F7 by approximately 1/2” [12.7mm]. Glue the tube to the formers (this tube is visible in the photo at step 5).

❏ 2. Before they are installed in the fuselage, test fit your servos in the **aft servo trays** to make sure they fit. Glue a servo tray **doubler** to the bottom of the **front** of both trays. The tray is wider at the front than the rear.

❏ 3. Cut an **aft servo tray rail** from a 1/4” x 3/8” x 36” [6.4 x 9.5 x 914mm] basswood stick to fit between the fuse sides approximately 1-7/8” [47.6mm] aft of former F5 where shown on the plan. It will be helpful if you cut the rail to a length that will provide a *friction fit* between the fuse side doublers so it will temporarily stay in position without using glue. Position the aft servo tray rail between the fuse sides.

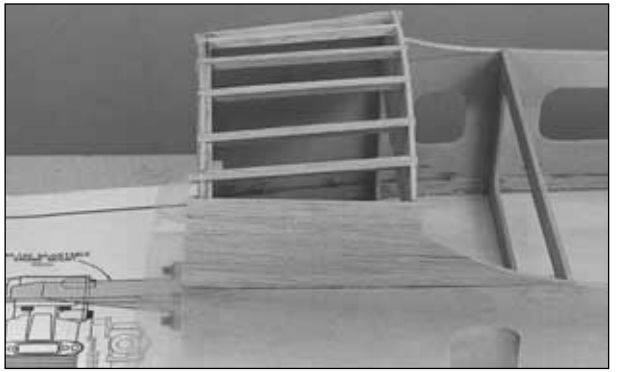
❏ 4. Position your servos into the servo trays and place the trays on the rail and former F5. Temporarily thread two nylon clevises just a few turns onto two 36” [914mm] threaded one-end pushrods. Install the pushrods into the pushrod guide tubes and connect the clevises to servo arms on your servos.



❏ 5. Position the rail and the servo trays so the servo arms align with the pushrods. Glue the rail and servo trays to former F5 and the fuse sides in this position. Drill 1/16” [1.6mm] holes in the servo trays and then harden the holes with some thin CA. Mount the servos with the screws, grommets and eyelets that came with your radio.

## FINISH FRAMING THE FUSE

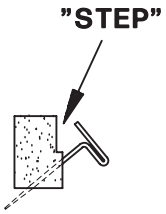
**Use this photo for the next two steps.**



❏ 1. Refer to the photo in the following step and test fit a die-cut 1/8” [3.2mm] balsa **forward fuse doubler** on the right side of the fuse. The front edge of the forward fuse doubler should align with the front edge of the fuse side doubler. Wet the outer surface of the doubler and glue it in place. Be sure that former F2 remains square and flat.

❏ 2. Glue the other forward fuse doubler to the left side of the fuselage. Use 3/16" x 3/16" [4.8 x 4.8mm] balsa sticks leftover from the aft bottom stringers to make the **forward bottom stringers** that fit in the notches of the firewall and F2. Glue the stringers in place.

❏ 3. Sand the stringers even with the formers. Sand the fronts of the triangle corner stringers so they blend to the ply side doublers and the bottom sheeting support.

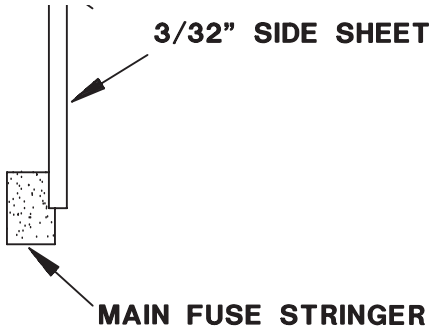



❏ 4. One at a time, remove the T-pins in the main side stringers aft of former F6. Replace them at an angle from the outside so they will not interfere with the side sheeting.

**T-34B Fact:** In the April, 1959 issue of *Fortune Magazine*, the Beechcraft Bonanza was included in the *100 best designs list.* The only other aircraft included in the list was another world famous airplane, the Douglas DC-3.

## SHEET THE FUSELAGE SIDES

❏ ❏ 1. Glue two 3/32" x 3" x 48" [2.4 x 76.2 x 1219mm] balsa sheets together to make a 6" x 48" [152.4 x 1219mm] **fuse side sheet**. After the glue is dry, sand the sheets so they are flat, even and smooth.




❏ ❏ 2. True one edge of the fuse side sheet. Hold the side sheet on the right fuse side with the front of the sheet about 1/4" [6.4mm] past the firewall. The sheet should rest on the edge of the step in the stepped balsa side stringers. Mark the wing saddle and corner stringer on the sheet. Trim the sheet about 3/16" [4.8mm] outside of the lines.

**Note:** The side sheet will not reach all the way back to the end of the fuselage. We will instruct you to add a piece of leftover 3/32" [2.4mm] balsa to the rear of the fuselage later.

❏ ❏ 3. Reposition the side sheet on the fuse. Mark and trim the front bottom of the side sheet 1/8" [3.2mm] above the bottom of the balsa front fuse doubler.

❏ ❏ 4. Test fit the side sheet and make any further adjustments necessary for a good fit.

❏ ❏ 5. Apply a bead of medium CA to the *step* portion of the stepped balsa side stringer from the firewall to former F6. Working quickly, position the side sheet on the ledge of the side stringer and press it into position where you have applied the glue. After the CA dries apply thin CA to the side stringer and side sheet aft of former F6 from inside the fuse. A long CA applicator tip, such as the Hobbico applicator tip (HCAR3780), helps you apply the CA just where you need it.

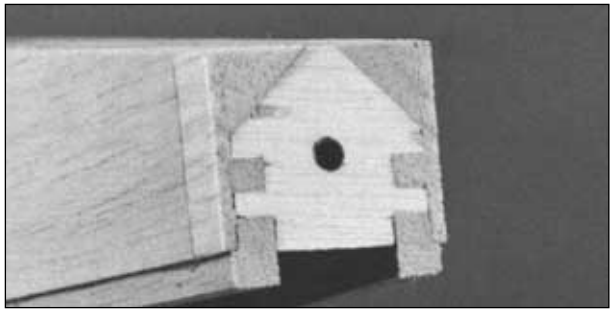
❏ ❏ 6. A little section at a time, carefully pry the fuse side from the fuse side doubler and apply thin or medium CA between the two. Quickly press them together. Do this until the fuse side is thoroughly glued to the side doubler.

❏ ❏ 7. Glue the fuse side to the side stringers with thin CA and hold them together until the CA cures. You can really see how the bottom half of the fuse will remain straight, true and flat when you remove it from your building board!

❏ 8. Return to step 1 and glue another side sheet to the left fuse side the same way.

❏ 9. Add pieces of leftover 3/32" [2.4mm] balsa to extend the side sheets to the end of the fuselage. See the photo at step 11.

❏ 10. Remove the T-pins and lift the fuselage from your building board. Reinforce glue joints you couldn't reach earlier or those that don't look strong.

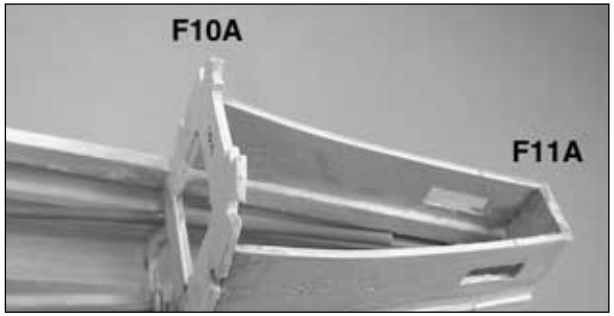


❏ 11. Trim, then sand the fuselage side sheeting and stringers that extend aft of former F11 so they are flush.

## MOUNT THE STAB AND FIN

**Note:** Build accurately during the next few steps. The stab saddle and the aft formers align the stab and set the incidence, which will greatly affect the way your model flies.

**Use this photo for the next three steps.**

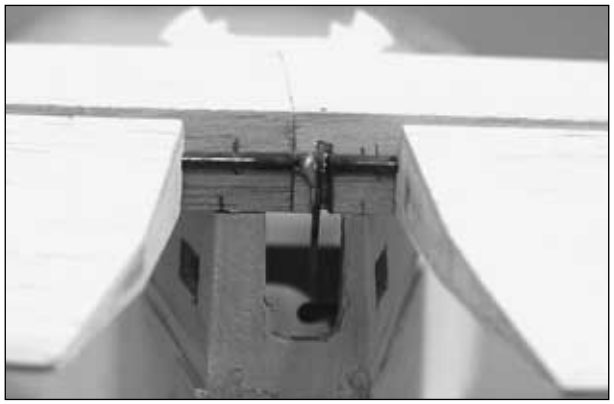



❏ 1. Glue the die-cut 1/8" [3.2mm] balsa **aft upper former F11A** to former F11.

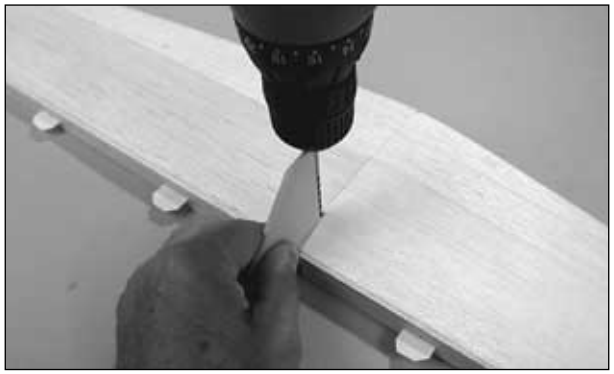
❏ 2. Securely glue the die-cut 1/8" [3.2mm] plywood **stab saddles** to the top of the main fuse side stringer and F11A.

❏ 3. Glue the die-cut 1/8" [3.2mm] plywood **upper former F10A** to the top of former F10. Glue the front of the stab saddles to F10A.

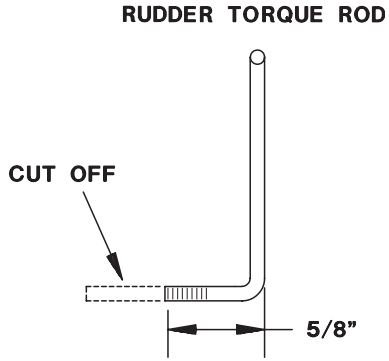
❏ 4. Use a bar sander with 80-grit sandpaper to sand the **front** of the stab so the *TE* will align with F11A when it is placed on the stab saddle.



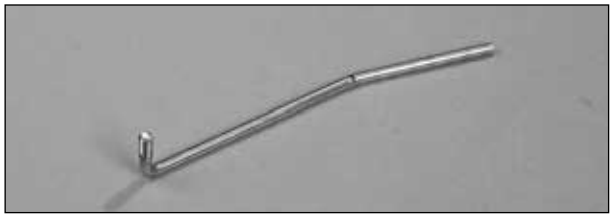
❏ 5. Use a hobby knife or a Multi-Pro™ with a sanding drum to cut F11A to clear the horn on the elevator joiner wire and the rudder torque rod.



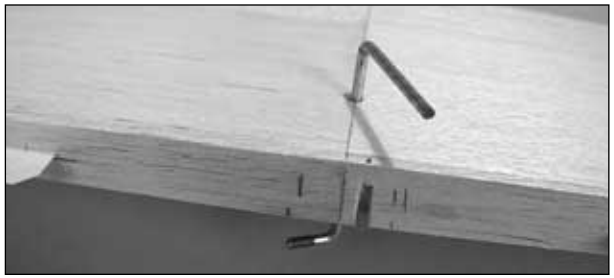
❏ 6. Mark the **center** of the stab 1-1/8" [28.6mm] from the TE. Drill a 1/8" [3.2mm] hole through the center of the stab at the mark. Use the die-cut 1/8" [3.2mm] ply **90 degree gauge** as a guide to keep the drill straight. **Hint:** A 6" [152mm] piece of 1/8" [3.2mm] brass tube sharpened at one end cuts a clean hole. **Note**: You must make sure you are drilling in the center of the stab as you are drilling into the two center 3/32" [2.4mm] ribs. Clean away any glue in the joint so that the drill will get a clean start into the hole.



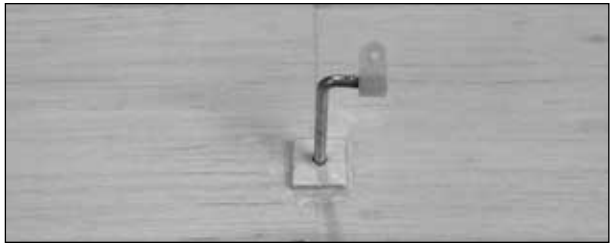

❏ 7. Cut the threaded end of the **rudder torque rod** so the threads extend 5/8" [15.9mm] as in the sketch. Tap threads in the nylon **swivel horn** with a 6-32 tap. Thread it onto the rudder torque rod until it is even with the end.



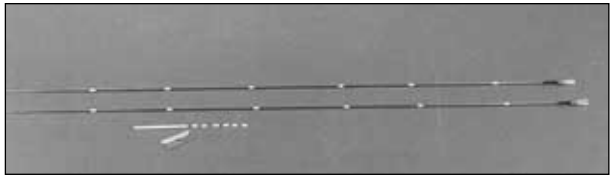
❏ 8. The rudder torque rod must be bent 90 degrees **after** it is inserted through the stab. Make a mark on the torque rod 2-1/2" [63.5mm] from the threaded end of the rod. Place the torque rod on the side view of the fuselage plan to confirm the mark is in the correct place. Notice in the above photo that we have made a *slight bend* in the torque rod. This will help insure that the 90 degree bend is made in the proper direction in the next step. Also, notice the orientation of the threaded end of the torque rod. **Caution:** Once installed in the stab, the threaded end of the rod must point to the left side and the 90 degree bend must face aft into the rudder.



❑ 9. Insert the **rudder torque rod** into the hole in the stab from the bottom. Use a heavy duty pair of pliers to make the 90 degree bend in the torque rod. This bend is not hard to make if you hold the vertical portion of the torque rod with the pliers and then use your thumb, or another pair of pliers, to bend the torque rod over. Midway through the bend check that it is 90 degrees to the threaded end of the rod.



❑ 10. Make a 1/2" x 1/2" [12.7 x 12.7mm] **bearing block** from some leftover 1/8" [3.2mm] ply. Drill a 1/8" [3.2mm] hole in the center of the block and install it on the torque rod on the **bottom** of the stab. Glue it in place with medium CA, being careful not to get any on the torque rod. Make sure that the nylon swivel horn has been installed on the threaded end of the torque rod, with the tab pointing towards the front of the stab.

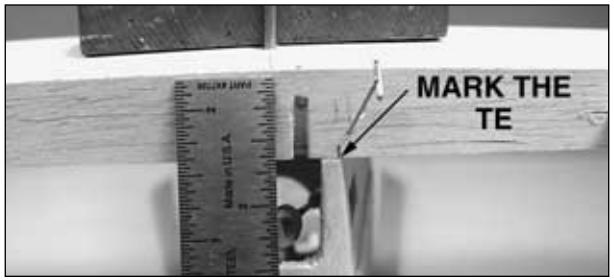


❑ 11. Cut 7" [177.8mm] from the non-threaded end of a .074" x 36" [1.9 x 916mm] **pushrod wire**. Clean residual oil from the wire with a cloth dampened with alcohol or other solvent. Cut six 1/4" [6.4mm] long **bushings** from the white inner pushrod tube, then slide the bushings evenly spaced onto the wire. Make sure the bushings at the ends of the wire will not protrude from the guide tube or the control could become stuck during flight. If the bushings slide onto the wire easily, hold them in place with a drop of thin CA. Make sure the CA cures before you proceed so you do not inadvertently glue the pushrods into the guide tubes! Slide a silicone **retainer** onto a **nylon clevis** and thread the clevis onto the wire about 15 full turns. Make a second pushrod the same way.

❑ 12. Cut the **rudder pushrod tube**, on the left side of the fuselage, so that it extends only 2" [51mm] aft of former F10. Connect one of the pushrods to the nylon swivel horn on the rudder torque rod and slide the silicone retainer into place. Slide the pushrod into the rudder pushrod tube in the **left** side of the fuselage. Slide the other pushrod into the elevator pushrod tube. Position the stab on the stab saddle. Place a weight on top of the stab to hold it in place.

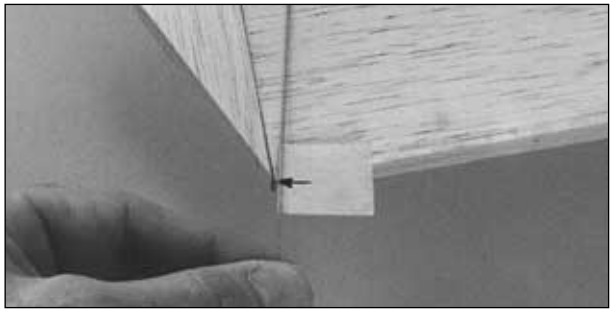
**Beech Quote:** "The Beechcraft Bonanza is a masterpiece of engineering; it's an airplane that constitutes a modern miracle of aeronautical design; and in our opinion, marks a new milestone in the progress of aviation." —Walter H. Beech, August 1, 1946

## CENTER THE STAB

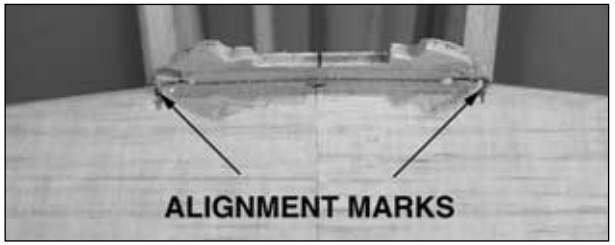



❑ 1. Align the TE of the stab with the center of former F11. Mark the TE of the stab above the stab saddles. Pin the stab TE to the stab saddle in this position.

❑ 2. Insert a T-pin in the **center** of the top of the firewall.



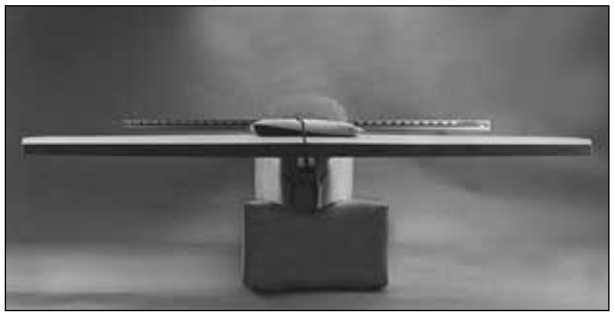
❑ 3. Tie a loop on one end of a 54" [1372mm] piece of string and connect it to the T-pin in the top of the firewall. Put a piece of masking tape with an arrow on it near the other end of the string. Slide the tape along the string and align the arrow with the corner of one of the stab halves. Swing the tape over to the other corner on the other side of the stab. Shift the stab and slide the tape along the string until the arrow aligns with both corners of the stab.




❑ 4. Mark the LE of the stab where it aligns with former F10A.

## ALIGN THE STAB HORIZONTALLY

❏ 1. Place two clothespins on the top of former F4 and rest a straightedge on the top of the fuse sides, propped up against the clothespins. See the following photo.



❏ 2. Stand behind the fuselage and view the stab and the straightedge to see if they align. If necessary, carefully sand one side of the stab saddle so the stab will align with the straightedge.

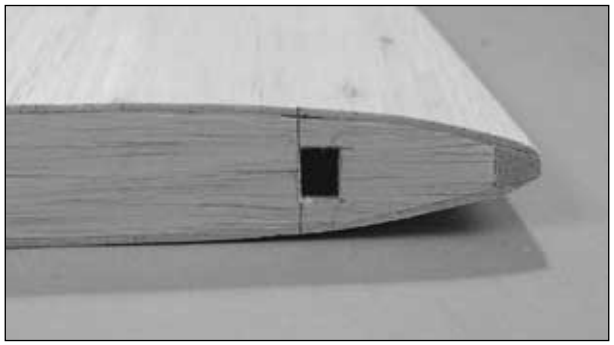
**Note**: If you have an incidence meter and want to check the incidence of the stab, now is a good time to do so. The incidence should be +2 degrees in relation to the main fuselage stringer.

❏ 3. Center the rudder clevis/nylon horn in the clearance slot in the stab saddle. Move the rudder pushrod wire back and forth to make sure the clevis and horn do not interfere with the fuse sides and the rudder torque rod can move freely. If necessary, adjust the pushrod wire or the *clearance slot* in the stab saddle. **There must not be any possibility of binding here**.

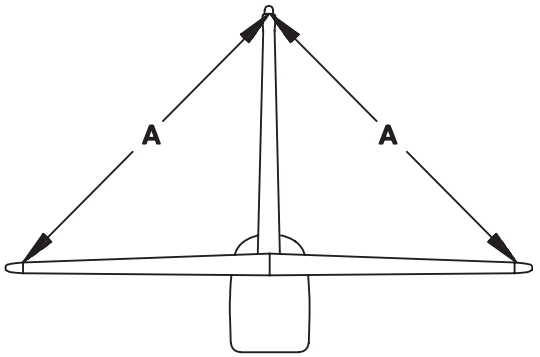
❏ 4. Mix 1/2 oz of 30-minute epoxy. Reinforce the joint between the stab saddles and the main stringers. Glue the stab to the saddles. Place the stab on the saddle so the marks you made earlier align. Before the epoxy cures, confirm alignment once more using the *pin and string* technique. Do not proceed until the epoxy has fully cured.

## MOUNT THE FIN

❏ 1. If you have not already done so, sand the sheeting on the bottom of the fin even with R1. Place the fin on the stab with the TE resting against the rudder torque rod. Mark the bottom of the fin at the front of fuselage former F10A.

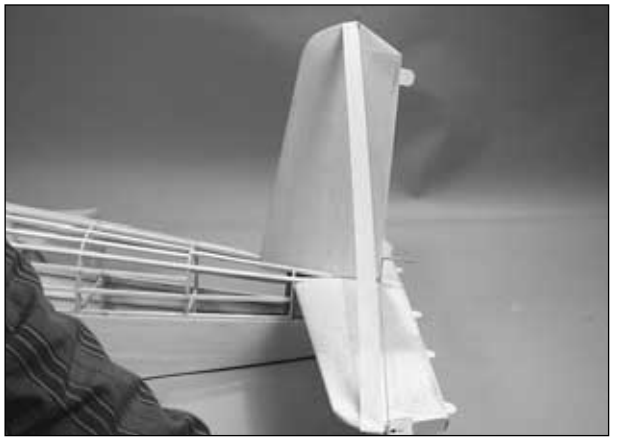


❏ 2. Cut a stick 4-7/8" [124mm] long from the leftover 1/4" x 3/8" [6.4 x 9.5mm] basswood stick. Cut a hole in R1 on the bottom of the fin for the stick. The hole should be forward of the mark you made, towards the LE of the fin. Insert the stick into the fin and check the fit of the stick and fin on the fuselage. The stick should extend to the hole for the receiver antenna tube in former F10 and should touch R2 inside the fin.




**A=A**

❏ 3. Check that the fin is vertical in relation to the stab. Use the *pin and string* technique or a ruler to measure the distance between the tip of the fin and the stab tips. Use an incidence meter or carpenters level to also check that the TE of the fin is perpendicular to the main fuselage stringer. Make any adjustments necessary.



❏ 4. Mix some 30-minute epoxy. Glue the basswood stick into the fin making sure to put epoxy on the end of the stick that touches R2 inside the fin. Glue the fin and stick to the top of the stab and to former F10.

Recheck that the fin is **vertical** in relation to the stab and that the TE of the fin is **perpendicular** to the main fuselage stringer. Also check that the TE of the fin is against the rudder torque rod and that the rod is in the **center** of the fin TE. Use masking tape to hold the fin in position until the epoxy is fully cured.

**Note:** Be very careful not to get any epoxy on the rudder torque rod or in the torque rod hole in the stab.

❏ 5. Test fit the rudder and elevator and temporarily hook up the pushrods. Make sure you can move the controls without any interference or binding. Make adjustments if necessary.

**T-34B Fact:** When the Navy evaluated the T-34, they selected it as the best trainer available. They could not just adopt the Air Force version, however, as this would require them to share the R&D costs. They made enough changes to the aircraft that it could be classified as a "new" model, the T-34B. While the changes were minor, they did have an affect on the way the aircraft handled. The dihedral of the wing was increased by one degree and a spring system was added to increase elevator stick forces.

## BUILD THE TURTLE DECK

❏ 1. Glue the die-cut 1/8" [3.2mm] ply formers **F7A, F8A** and **F9A** to the tops of their respective formers.

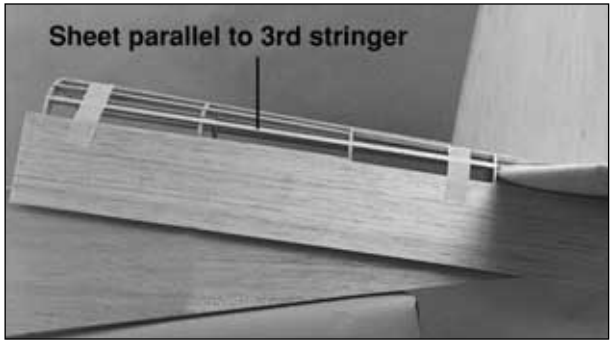
❏ 2. Cut the **turtle deck stringers** from seven 3/16" x 3/16" x 30" [4.8 x 4.8 x 762mm] balsa sticks. Glue the stringers into the notches of the formers as shown on the fuselage plan and in the photo. Note the arrangement of the stringers at F9A.

**Important:** Align the formers with a straightedge as you glue the stringers to them.


❏ 3. Sand the stringers and formers so they blend together.

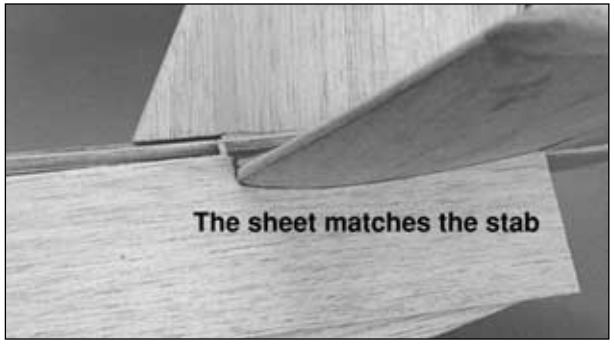
❏ 4. The turtle deck is sheeted with four 1/16" [1.6mm] balsa sheets–one sheet on the bottom of each side of the turtle deck and one sheet on the top of each side of the turtle deck. Examine the four 1/16" x 3" x 24" [1.6 x 76.2 x 610mm] balsa sheets and set the two softest sheets aside to be used for the top.

**Caution:** To save weight in the aft end of the model, the turtle deck is sheeted with 1/16" [1.6mm] balsa. Be careful installing the sheeting so that it will not require an excessive amount of sanding.




❏ ❏ 5. Cut one of the bottom turtle deck sheets to a length of 21-1/2" [546mm]. Position the sheet on the left side of the turtle deck so the top edge contacts the bottom of the stab and is parallel to the third stringer from the bottom as shown in the photo.

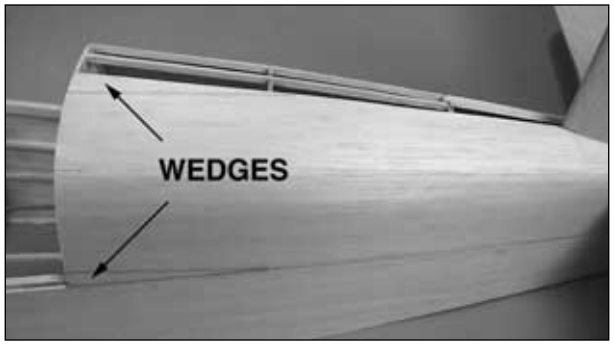
❏ ❏ 6. Use a ballpoint pen to mark the bottom of the stab onto the sheet. Remove the sheet and cut along the line you marked.



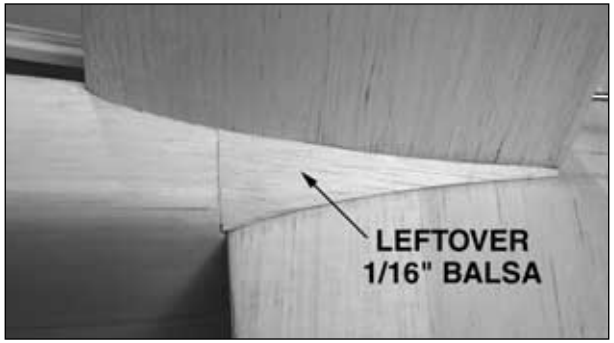

❏ ❏ 7. Reposition the sheet so that it rests against the bottom of the stab. Mark and cut it along the line. Do this until the sheet accurately matches the bottom of the stab.

❏ ❏ 8. Fill in the small *wedge* between the turtle deck side sheet and the fuse side with a leftover piece of 1/16" [1.6mm] balsa. See the photo at step 10.

❏ ❏ 9. Trim the top of the sheet so it *ends* in the center of the third stringer. Trim the bottom of the sheet so it matches the top of the fuse side. Glue the sheet into position.




❏ ❏ 10. Trim another 1/16" x 3" x 24" [1.6 x 76.2 x 610mm] balsa sheet to fit between the bottom turtle deck sheet and the center of the top, **center** stringer. Trim the aft end of the sheet so it fits the fin and ends at former F10A. Glue the sheet in position. Make a *wedge* from a 1/16" [1.6mm] leftover piece of balsa to fit between the two turtle deck sheets in the front.




❏ ❏ 11. Fill the space between the fin and the stab with a leftover piece of 1/16" [1.6mm] balsa.

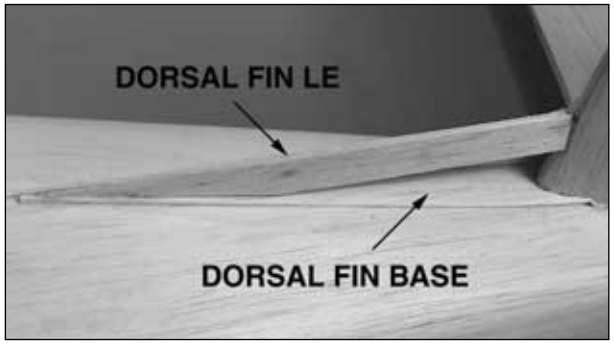
❏ 12. Sheet the right side of the turtle deck the same way.

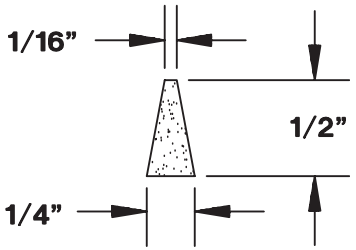
❏ 13. Trim, then sand the turtle deck sheeting so it is flush with former F7A and F11A. The sheeting at the front should be even with F7A where it meets the *ledge* on the side stringer.

IMPORTANT NOTE: Some modelers prefer to *sand as they build* instead of waiting until the very end. If you prefer to do a little sanding now to even the turtle deck sheeting with the fuse sides, you may do so but **do not over-thin** the 1/16" [1.6mm] turtle deck sheeting because the **ABS tail cone** and **canopy** have yet to be fitted and must match the sheeting.

## BUILD THE DORSAL FIN

❏ 1. Use the pattern on the plan to make the **dorsal fin base** from leftover 1/16" [1.6mm] balsa. Glue the dorsal fin base to the top of the turtle deck. Make sure the front of the base is **centered** on the fuse centerline.



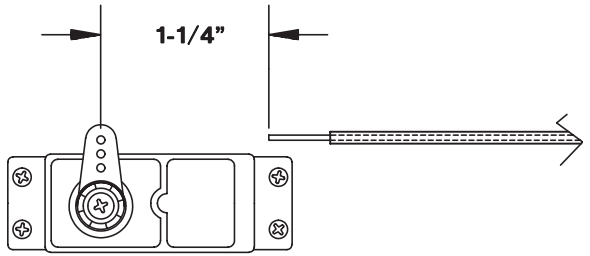

❏ 2. Cut the 15" [381mm] tapered balsa **dorsal fin LE** to the shape shown on the plan. Glue the dorsal fin LE to the fin LE and the dorsal fin base.

❏ 3. Make two **dorsal fin sheets** from leftover 1/16" [1.6mm] balsa sheeting using the pattern on the plan. Test fit and glue one of the sheets to the turtle deck and dorsal fin base. Wet the sheet and glue it to the dorsal fin LE. Make sure you do not pull the dorsal fin LE off to one side when you glue the sheet to it. Glue the other dorsal fin sheet in position.

❏ 4. Apply Hobbylite™ filler to the dorsal fin and fin filler sheet to blend them to the fin. Apply filler to the front of the dorsal fin to complete the taper and blend it to the turtle deck. Do not apply all the filler in one application but build up thin layers, allowing each layer to fully dry before you apply the next. Sand the filler, blending the dorsal fin, fin filler and fin into one smooth contour.

## HOOK UP THE RUDDER AND ELEVATOR

❏ 1. Install the pushrods in the guide tubes. Temporarily connect the clevis, with a silicone retainer, to the elevator control horn and fit the rudder and elevator in place.




❏ 2. Place a servo arm on your rudder and elevator servos. With the servos centered and the rudder and elevators neutral, use a felt-tip pen to mark the pushrods exactly 1-1/4" [31.8mm] from the holes in the servo arms. Remove the pushrods from the fuselage (see the note below). Cut them at the marks you made.

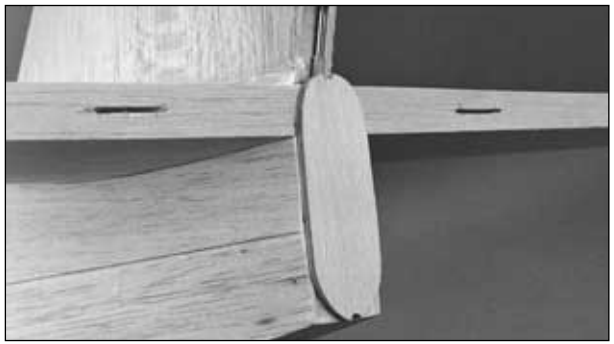
Note: It is very difficult to remove the rudder pushrod now that the stab is glued in place. It is not difficult to solder the pushrod with it installed in the fuselage in the following step. You might also consider cutting an access hatch in the fuselage side so that you can remove the pushrod. This hatch can also be used for future maintenance.

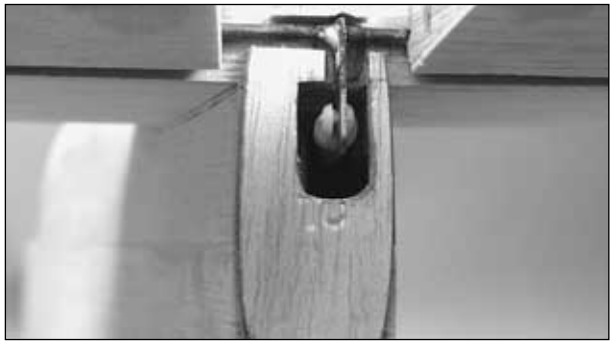
❏ 3. Silver solder a **threaded coupler** onto each wire pushrod. Reinsert the pushrods into the fuselage and thread a nylon clevis onto the couplers. Temporarily connect the pushrods to the servos and rudder and elevator. Adjust the length of the pushrods if necessary by turning the clevises in or out.

**Hint:** It will be easier to thread the clevis onto the threaded coupler if you install it on the servo arm first, using the arm for better leverage. Be careful not to damage the pin on the clevis.

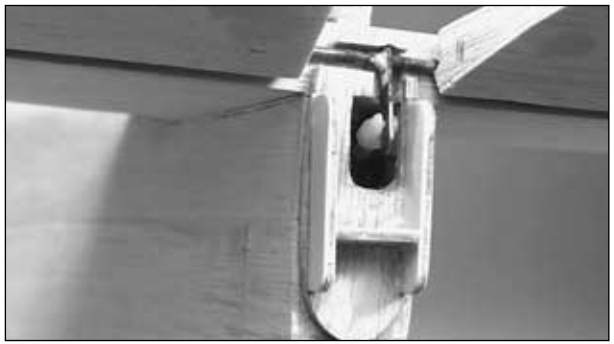
**T-34B Fact:** Beech built a total of 423 T-34B aircraft, starting in 1954. The Navy used the aircraft for over twenty years, flying over 100,000 hours per year. Training was conducted at NAS Saufley Field and NAS Whiting Field.

## FIT THE TAIL CONE

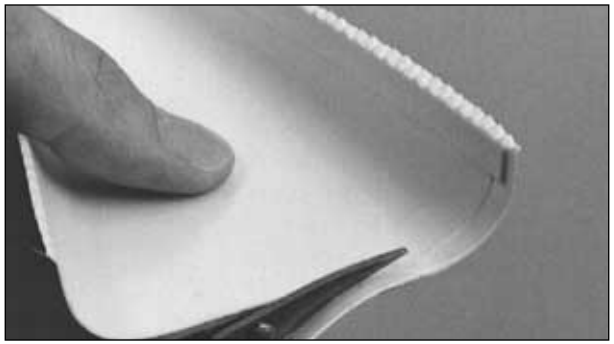




❏ 1. Fit the die-cut 1/8" balsa **tail cone former (F11TC)** on the aft end of the fuselage. Shape F11TC as needed to fit the end of the fuselage, allowing for the thickness of the ABS tail cone. Remove material as needed to clear the torque rods and pushrods. Glue F11TC into place. **There must be no possibility of binding here.**



❏ 2. Glue the die-cut 1/8" [3.2mm] plywood **tail cone mounts** to the tail cone former.



❏ 3. Cut both formed ABS **tail cone halves** along the cutlines. The cutlines can be most easily seen from the inside. We highly recommend a pair of Hobbico curved tip Canopy Scissors (HCAR0667) because you can cut straight lines or small tight curves easily and accurately. You could also use a small pair of regular scissors or **score** the plastic along the cutlines with a hobby knife and flex the plastic until the excess breaks free.

❏ 4. True the edges of both tail cone halves with coarse sandpaper and a bar sander. Thoroughly rough up the mating surfaces so glue will stick. Fit the tail cone halves together and check the fit on the tail cone former. Make any adjustments needed for a good fit. Carefully glue the tail cone halves together with thin CA. Use just a few drops at a time. **Note:** Do not use CA accelerator on any of the ABS plastic. Accelerator may cause the plastic to develop cracks over time and prevent some types of paint from sticking.

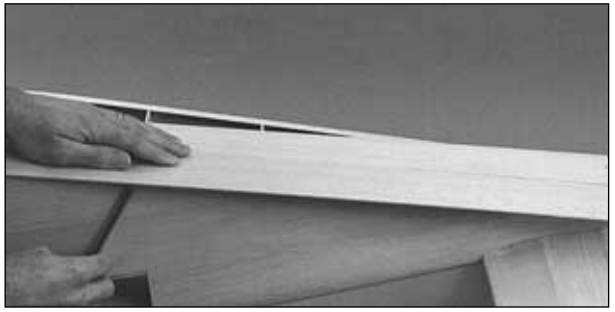
❏ 5. Trim the clear plastic **tail lens** to fit on the end of the tail cone. Do not glue the tail lens in place until after you paint the tail cone.

❏ 6. Cut round notches in the sides of the tail cone to clear the elevator joiner wire. Fit the tail cone on the aft end of the fuselage and drill two 1/16" holes on each side. Remove the tail cone and enlarge the holes in the tail cone only with a 3/32" drill bit. Harden the holes in the tail cone mount with some thin CA. Fasten the tail cone to the mount with four #2 x 3/8" [9.5mm] screws. **Make sure the screws do not interfere with the elevator torque rod**.

## SHEET THE FUSELAGE BOTTOM

❏ 1. If you are going to hook up working lights, now is a convenient time to route the wire for the light in the tail. Route the wire through the formers. Glue the wire to the formers with rubber cement or a drop of CA so they don't rattle around. Allow enough wire to extend past former F11 so it will reach the back of the tail cone.

❏ 2. Cut a 3/32" x 3" x 30" [2.4 x 76.2 x 762mm] balsa sheet to a length of 28" [711mm]. True both edges of the sheet with a hobby knife and a straightedge. Pin the sheet to the bottom of the fuselage in the center so the end butts against the front edge of the tail cone.

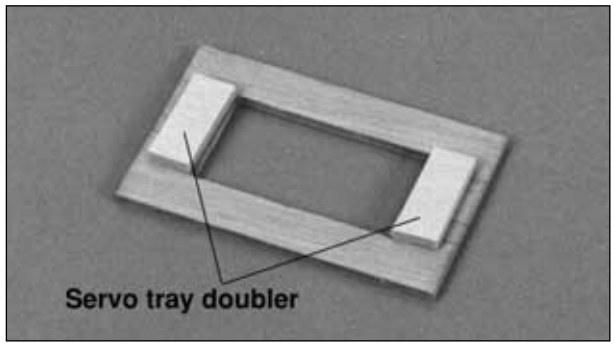


❏ 3. True both edges of another 3/16" x 3" x 30" [2.4 x 76.2 x 762mm] balsa sheet. Position the sheet on the bottom of the fuselage next to the center sheet. Use a ballpoint pen to mark the side of the fuselage onto the sheet. Cut the sheet along the line you drew. Do the same with the remainder of the sheet on the other side of the fuselage.

❏ 4. Glue the three bottom sheets together. After the glue dries, sand the fuselage bottom sheet so it is flat and the edges are even. Sand the bottom at the formers and stringers so that they are even and flat. Glue the fuselage bottom sheet to the bottom of the fuselage.

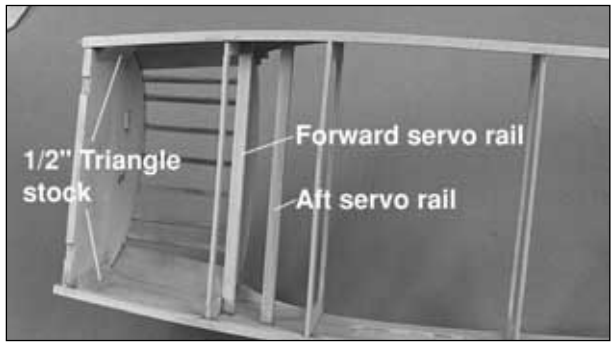
❏ 5. Shape the bottom corners of the fuselage with a long bar sander as shown in the cross sections on the plan so they blend with the tail cone at the rear.

## MOUNT THE ENGINE




❏ 1. Glue the die-cut 1/8" [3.2mm] plywood **servo tray doublers** to the bottom of both die-cut 1/8" [3.2mm] plywood **forward servo trays**. Mount your throttle servo to one tray and your nose wheel steering servo to the other tray using the screws, grommets and eyelets that came with the servos.

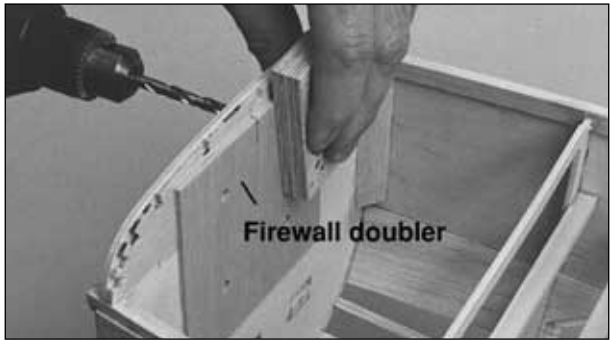
❏ 2. Cut an 8-1/2" [215.9mm] ***forward*** **servo rail** from a 1/4" x 3/8" x 36" [6.4 x 9.6 x 914mm] basswood stick to fit between the fuselage sides behind former F2. Test fit, then glue the servo rail to the fuse sides and former F2 1-7/8" [47.6mm] below the top edge of F2.

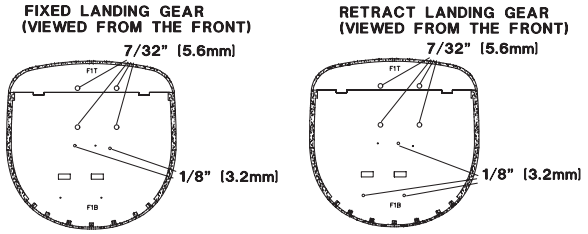



❏ 3. Cut a 8-3/4" [222.3mm] **aft servo rail** to fit between the fuselage side doublers 7/8" [22.3mm] aft of the forward servo rail. Place the throttle and nose wheel steering servos and trays between the rails. Adjust the position of the aft rail to fit your servos. Glue the aft servo rail in place. **Do not** glue the servo trays in place until instructed to do so.

❏ 4. Glue the **F1T/F1DT** assembly to the top of the firewall. Use a straightedge to make sure they align.

❏ 5. Glue the die-cut 1/8" x 4" x 4" [3.2 x 101.6 x 101.6mm] plywood **firewall doubler** to the back of the firewall, centered on the engine mount punch marks, 1/8" [3.2mm] below the notch in the center of F1DT as shown on the plan.



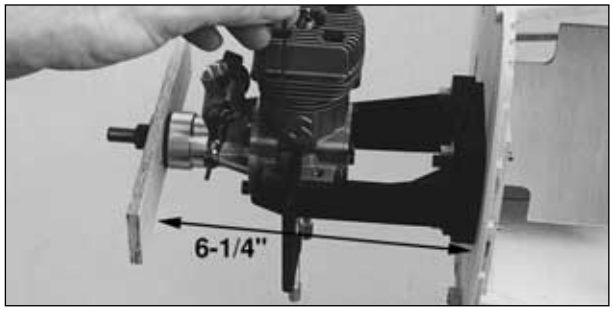

❏ 6. Drill the correct size holes through the punch marks on the front of the firewall as shown in the sketches above. Tightly hold a **thick** block of wood on the back so the drill does not split the wood when it comes through.

❏ 7. Press four 8-32 blind nuts into the 7/32" [5.6mm] holes on the back of the firewall. Use an 8-32 x 1-1/2" [[38.1mm] socket head cap screw with some large washers to *draw* the blind nuts into the wood. Wick thin CA around the back of the blind nuts to permanently hold them in place.


❏ 8. Temporarily clamp the die-cut 1/8" [3.2mm] plywood **tank floor** to the forward servo rail so it is centered on the back of the firewall doubler. Turn the fuselage over and push the tank floor up until it contacts the edge of the bottom blind nuts. Glue a 3/16" x 3/16" x 3" [4.8 x 4.8 x 76.2mm] balsa stick to the back of the firewall under the tank floor to serve as a **forward tank floor ledge**. Do not glue the tank floor to the ledge until instructed to do so.

❏ 9. If you have not already done so, sand the fuselage side doublers and fuselage sides so they are flush with the front of the firewall.

❏ 10. Cut the **spacer bar** off both **engine mount halves** and trim off any *flashing* so they easily fit together. Loosely bolt your engine mount to the firewall with four 8-32 x 1-1/4" [31.8mm] socket head cap screws, #8 lock washers and #8 flat washers. Adjust the mount so your engine will fit. Tighten the screws to securely hold the mount to the firewall. Use small clamps to hold your engine to the mount so the front of the drive washer (or the back plate of your spinner) is 6-1/4" [158.8mm] from the firewall. Mount a flat wood stick or the back plate of your spinner to the engine so you can measure the distance.



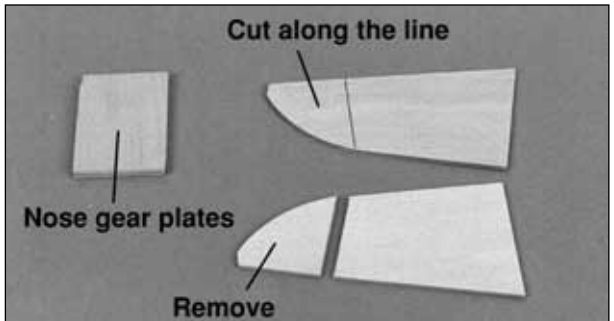

❏ 11. Mark the engine mounting bolt holes on the mount. **Hint:** Mark the holes with a wire rod sharpened at one end. Heat the tip of the rod with a torch to dimple the engine mount in the **center** of the holes. The Great Planes Dead Center Tool (GPMR8130) also works well.

❏ 12. Remove the engine from the mount and the mount from the firewall. Use a drill press, if you have access to one, or use a hand drill to drill the holes with a #29 or 9/64" drill bit for 8-32 screws. Tap 8-32 threads into the mount. Screw the mount back onto the firewall. Screw the engine to the mount with 8-32 x 1" socket head cap screws, #8 lock washers and #8 flat washers to see how it fits.

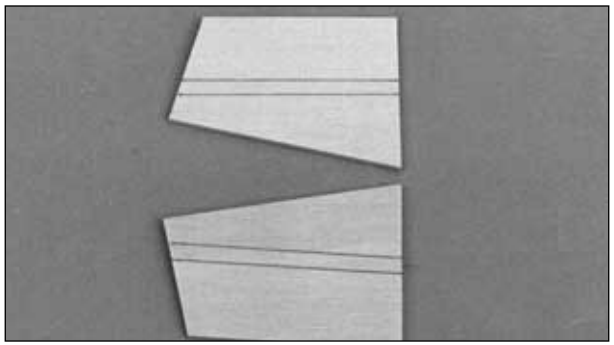
## MOUNT THE NOSE LANDING GEAR

Continue with these instructions if you are installing fixed landing gear. If you are installing retracts, skip to *Retractable gear* on page 47.

**Fixed gear**

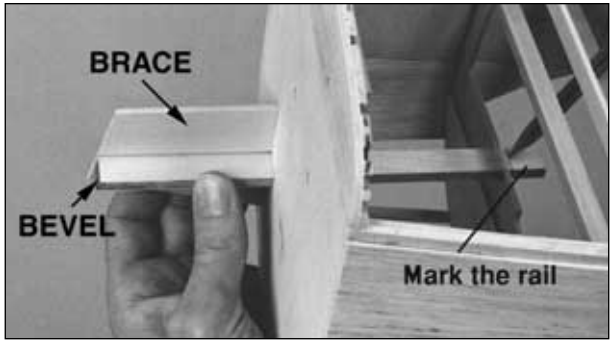



❏ F1. Draw a line connecting the punch marks on both die-cut 1/8" [3.2mm] plywood **nose landing gear braces**. Cut the braces off at the line. Glue the two die-cut 1/8" [3.2mm] plywood **nose gear plates** together. Make sure the punch marks face out.

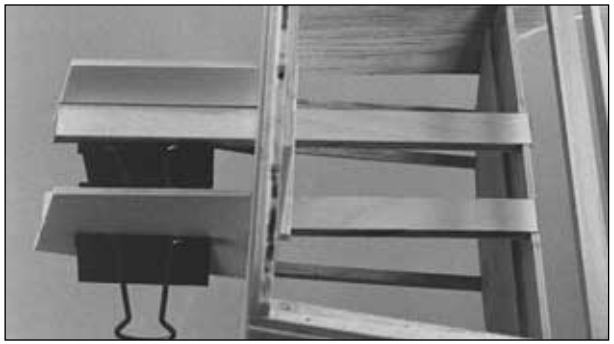


❏ F2. Place the braces over the **nose gear detail** on the plan. Mark the location of the 1/4" [6.4mm] plywood landing gear rails onto the braces.

❏ F3. Remove the engine mount from the firewall.

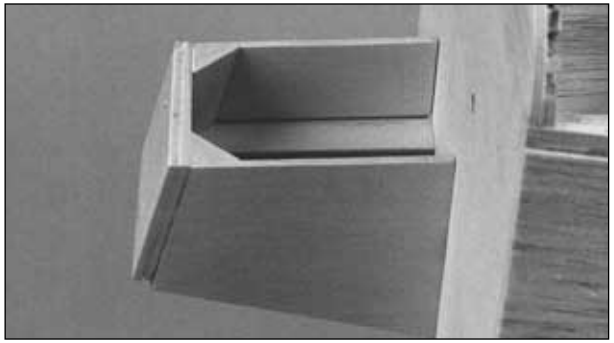



❏ F4. Cut a bevel on the end of the 1/4" x 9/16" x 9" [6.4 x 14.3 x 228.6mm] plywood **landing gear rails** to match the angle on the end of the braces. Test fit a rail through the right side of the firewall and in the notch in former F2. Position the right brace and align the front of the rail with the front of the brace. Mark the rail 1/8" [3.2mm] aft of former F2. Remove the rail and cut it at the mark. Mark the other rail in the same manner.



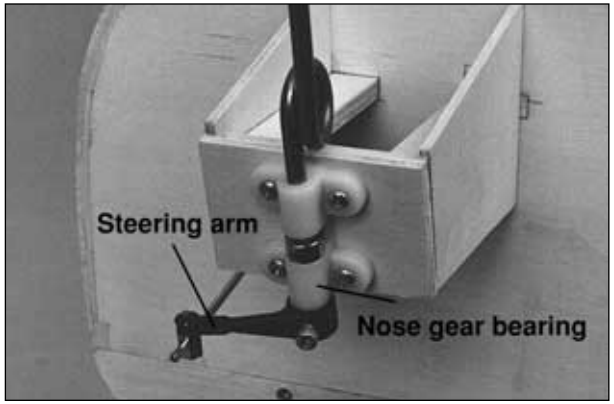
❏ F5. Use 30-minute epoxy to simultaneously glue the rails to the firewall and former F2, and the rail braces to the rails and the firewall. Make sure the front of the rails are even with the front of the braces.

❏ F6. Drill 1/8" [3.2mm] holes through the punch marks in the nose gear plate. Press four 4-40 blind nuts into the holes in the plate, and secure them with thin CA.



❏ F7. Position the nose gear plate on the front of the braces. Trim the rails so the blind nuts do not interfere. Use 30-minute epoxy to glue the nose gear plate to the rails and rail braces. Hold the plate in position with masking tape until the epoxy is fully cured. Add balsa triangle **braces** as shown on the plan cut from leftover fuse corner stringers. See the photo below at step 8.

**Use this photo for the next four steps.**




❏ F8. Mount the nylon **nose gear bearing** to the nose plate with four 4-40 x 1/2" [12.7mm] screws. Enlarge the holes in the nose gear bearing for the nose gear strut with a #10 drill bit (if you don't have a numbered drill set, an 13/64" [5.16mm] drill bit will work too).

❏ F9. Enlarge the outer hole in the black, nylon **steering arm** with a # 41 drill bit or a hobby knife. Mount the heavy-duty **Screw-Lock connector** to the steering arm with the **one-way star washer**. Mount the 3/16" [4.8mm] **nose gear wire** to the nose gear bearing with a 3/16" [4.8mm] **wheel collar** and **set screw**. Mount the steering arm and a 6-32 x 1/4" [6.4mm] socket head cap screw as shown on the plan. Notice that the steering arm is slightly off center when the nose gear is centered. See the photo above at step 8.

❏ F10. Temporarily fit your nose steering servo and tray on the forward servo rails. Fit a servo arm to your servo.

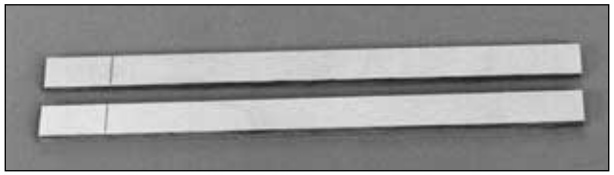
❏ F11. Thread a 4-40 **hex nut** followed by a 4-40 **metal clevis** onto a .095 x 12" [304.8mm] **nose steering pushrod**. Connect the clevis to the servo. Connect the other end of the pushrod to the screw-lock connector in the steering arm. Cut the pushrod about 1/4" [6.4mm] past the connector. Make a slight bend in the pushrod near the screw-lock connector so it aligns with the hole in the connector. Temporarily secure the pushrod to the connector with a **set screw**.

❏ F12. Securely glue the nose steering servo tray to the servo rails. Make sure your servo is centered, and tighten up the 4-40 jam nut on the clevis with a drop of thread lock for extra security. File **small** flat spots in the nose gear to securely hold the set screws.

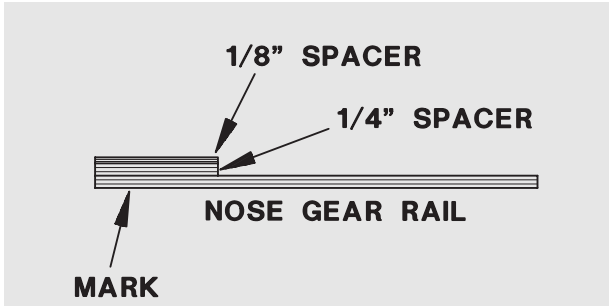
*That was easy, wasn't it? Now hook up the throttle. It's just as easy! Skip to* ***Hook Up The Throttle*** *on page 49.*

***Retractable nose gear***

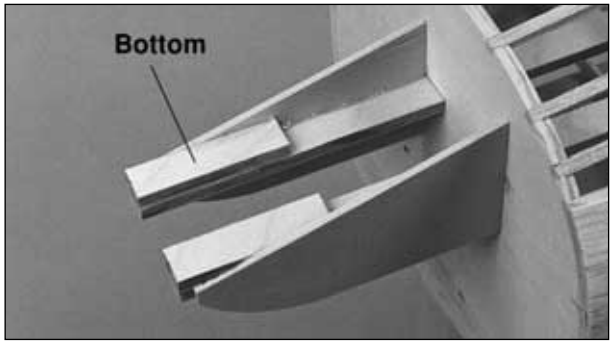
**Note:** While there are other retractable nose gear units that may work in the Top Flite Gold Edition Beechcraft T-34B, the Robart 631 is shown in this manual because it rotates 105 degrees and is designed specifically for this model. A 90 degree unit would work but the mounting position would have to be raised and the rails would have to be slanted upward toward the front of the model in order to achieve the scale appearance of the full-size T-34B. These modifications are up to you.



❏ R1. If you're using the Robart 631 nose gear retract, mark a line 7-7/8" [200mm] from one end of both 1/4" x 9/16" x 9" [6.4 x 14.3 x 228.6mm] plywood **landing gear rails**. This will position the *pivot point* of the 631 nose gear 7-7/8" [200mm] from the aft edge of F2.

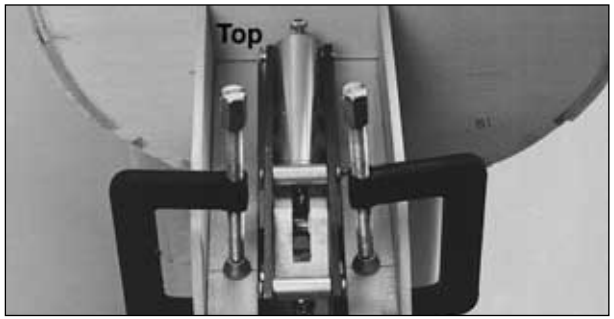



❏ R2. Glue one 1/4" x 9/16" x 2-1/4" [6.4 x 14.3 x 57.2mm] plywood **rail spacer** and one 1/8" x 9/16" x 2-1/4" [3.2 x 14.3 x 57.2mm] plywood **rail spacer** on the end of both rails that you made the mark on, but on the other side of the rail.




❏ R3. Temporarily place the landing gear rails through the firewall and into the notches in F2. The rails should be even with the rear face of F2. The spacers should be on the bottom of the rails and the marks you made should be on the top of the rails (remember *up* is always toward the top of the fuse even if it is upside-down). Position the nose gear on the rails and mark the location on the firewall where the air fitting on the back of the air cylinder contacts it. Drill a 3/16" [4.8mm] hole at this point

❏ R4. Use 30-minute epoxy to glue the rails to the firewall and former F2, and the die-cut 1/8" [3.2mm] plywood landing gear braces to the rails and the firewall.




❏ R5. Use small clamps to hold the nose gear to the rails so the pivot point (on the Robart 631's) aligns with the marks you made on the top of the rails. Mark the locations of the mounting holes on the landing gear rails.

❏ R6. Remove the landing gear and drill 5/32" [4mm] holes at the marks you made. Temporarily mount your landing gear with 6-32 x 3/4" [19mm] bolts and blind nuts (not included).

❏ R7. Remove the two 3/16" [4.8mm] stringers that interfere with the wheel and strut. Use a Dremel Tool or a razor saw to cut the firewall to accommodate the strut. Retract the nose gear and make sure it does not interfere with the firewall. **Note**: Adjust the **centering spring** on your retracts so the nose wheel is neutral and make sure the nose wheel is centered on the strut. On the Robart 631 strut we inserted two #8 washers between the wheel and the strut to center the wheel. The nose wheel **must** be **neutral** and **centered** to fit between the rails when retracted. **Hint:** File or sand a slight bevel to the bottom edges of the rails to guide the nose wheel, in case it is not exactly centered.

❏ R8. If you have your air pump and some quick disconnects handy, temporarily connect them to your nose gear air cylinder and actuate the nose gear with the air pump. This will give you a good indication of any problem areas that you can correct now.

**Use this photo for the next three steps.**

❏ R9. Cut 3/16" [4.8mm] off the aft edge of the die-cut 1/8" [3.2mm] plywood **nose steering servo tray**. Mount your nose steering servo to the servo tray, using the hardware that came with the servo, so the output shaft is on the **left** side of the servo tray as shown in the photo. Note that the servo is offset toward the aft edge of the servo tray (the side you cut off).

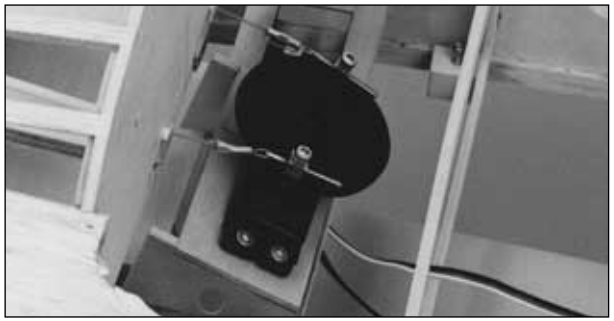
❏ R10. If you would like to mount your air control valve in the same location as in our prototype, drill a 1/2" [12.7mm] hole in the die-cut 1/8" [3.2mm] plywood **right nose steering servo tray mount** at the punch mark.

❏ R11. Test fit the servo tray (with the servo) in the die-cut 1/8" [3.2mm] plywood **servo tray mounts** and fit the assembly in the servo rails. Position the mounts and the tray so the output shaft of the servo is centered between the 1/8" [3.2mm] holes in former F2. Glue the servo tray and the mounts in this position.

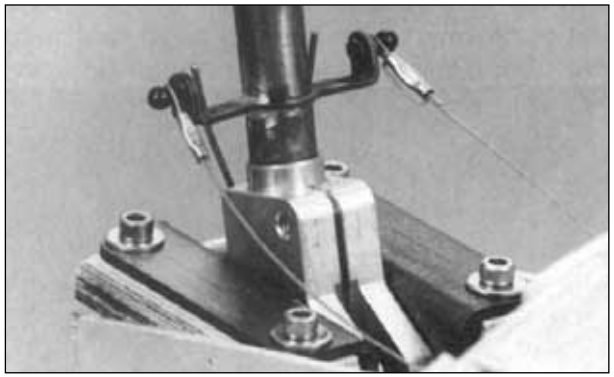
❏ R12. Cut two 4-5/8" [117.5mm] pieces from the white nose steering cable inner pushrod guide tube and slide the pieces through the holes in the firewall and former F2. Glue the tubes to the firewall and F2.

***Connect the nose steering pull-pull***

Several pull-pull steering cable systems are available that will work in your Mentor. We selected the Du-Bro #517 2-56 Pull-Pull System.



❏ R1. Enlarge the hole in two Screw-Lock pushrod connectors with a # 46 or 5/64" [2mm] drill bit. Mount the screw-lock connectors to a large servo arm and fasten each with a nylon retainer. Connect one end of a 14" [355.6mm] long pull-pull cable to a threaded rod included with the pull-pull steering set using the *swage* to secure the cable. Fit the threaded rod into one of the Screw- Lock connectors and temporarily lock it down with a 4-40 x 1/8" [3.2mm] socket head screw. Connect another piece of cable to the other Screw-Lock connector the same way, then thread the cable through the guide tubes toward the nose gear strut.



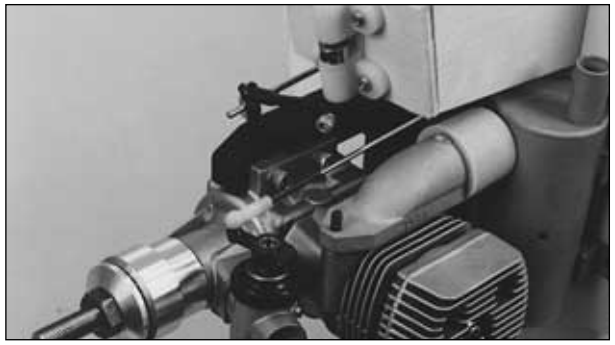
❏ R2. Install a 0-80 threaded ball link ball (not included) onto the arm on both sides of the nose wheel strut with a 0-80 nut. Connect the other end of both cables to the threaded ball links with the swages. Tighten the loop in the cable just enough so it will not come off the ball. Crimp the swages. Temporarily hook up the steering servo to your radio system and test the movement. Adjust the tension on the cables or make other adjustments if needed.

**Note:** If your nose gear steering arms did not come bent 90 degrees as shown, do so now.

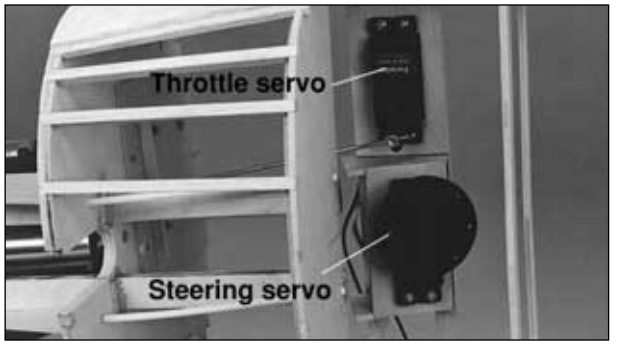
# FINISH CONSTRUCTION

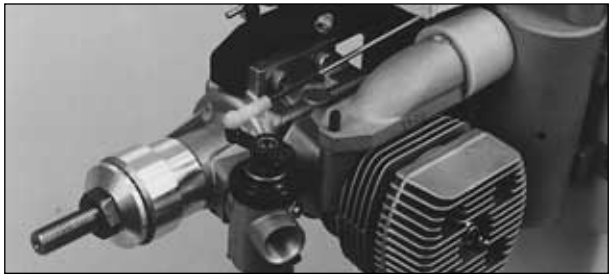
## HOOK UP THE THROTTLE

❏ 1. Mount your engine mount and engine to the firewall. Mount your muffler to make sure your throttle pushrod will not interfere.

This is the throttle servo location for fixed gear.



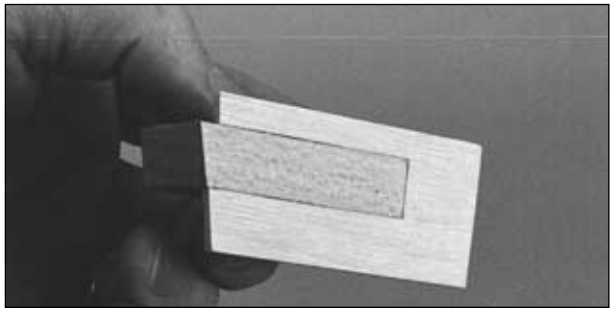



*This is the throttle servo location for retractable gear.*

❏ 2. Place your throttle servo tray on the rails. Position the throttle servo in the tray. Connect the .074" x 17-1/2" **throttle pushrod** to your servo with a small, brass **Screw-Lock connector**. Connect the other end of the throttle pushrod to the engine with a nylon **ball socket,** 0-80 **threaded ball** and 0-80 **nut**. Use a drop of thread lock on the nut. Glue the throttle servo tray to the rails. Secure the throttle servo to the tray with the hardware that came with the servo.

## MOUNT THE WING TO THE FUSE

Remember the wing? Go get it so you can mount it to the fuse.



❏ 1. Bevel the end of both 1/2" x 1" x 2-1/4" [12.7 x 25.4 x 57.2mm] maple **wing bolt blocks** so they match the angle of the die-cut 1/8" [3.2mm] plywood **wing bolt block holder**.

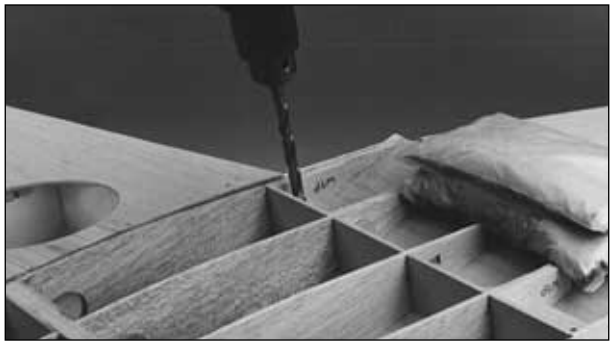
❏ 2. Use 30-minute epoxy to glue the wing bolt blocks and holders in the fuse where shown on the plan. See the photo at step 8.

❏ 3. Place the wing in the wing saddle on the fuse with the dowels in the center section in the holes in F2. Observe any *high spots* in the saddle of the **balsa** fuse sides that prevent the wing from fitting. Remove the wing and sand the high spots so the wing matches the fuse as accurately as possible. Do not sand the ply fuse side doublers. Also check that the stab and wing are parallel.

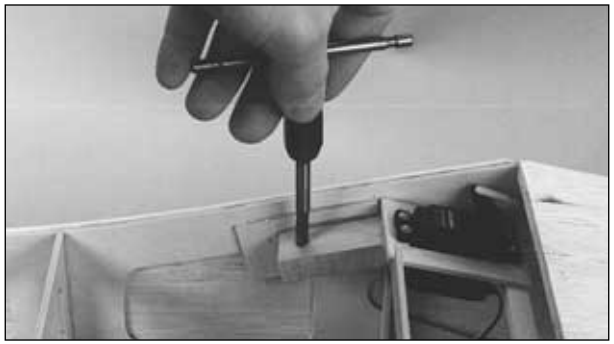
❏ 4. Remember the *pin and string* method you used to align the stab? Get your string out and stick a T-pin in the center of the bottom, middle stringer just ahead of the tail cone.

❏ ❏ 5. Use the arrow on the tape to align the wing with the fuse the same way you did the stab.

❏ ❏ 6. Once you have the wing aligned, place weights over the center section to keep it from shifting during the next few steps. Keep your string handy so you can recheck alignment as you proceed.



❏ ❏ 7. Drill through **only one** wing bolt plate, the top sheeting and the wing bolt block on one side of the wing with a #7 drill. Keep the drill bit perpendicular to the wing bolt plate as you drill so the head of the wing bolt will rest flat.



❏ ❏ 8. Remove the wing and tap threads into the wing bolt block with a 1/4-20 tap. Enlarge the hole in the wing bolt plate and the top sheeting with a round file or a 17/64" [6.8mm] drill. Replace the wing on the fuselage and bolt it down with the one 1/4" - 20 nylon wing bolt.

❏ 9. **Remount the #7 drill bit in your drill**. Repeat steps 5, 6, 7 and 8.

❏ 10. Bolt the wing to your fuselage and leave the wing bolts barely snug. Realign the wing.

❏ 11. Drill 1/4" [6.4mm] holes through the 1/8" x 1" x 2" [3.2 x 25.4 x 50.8mm] plywood **wing dowel plates**. **Slightly** enlarge the holes with a round file or a piece of sandpaper wrapped around something round such as a pen or a piece of brass tube. This will allow you to plug the wing into the fuselage without too much resistance.

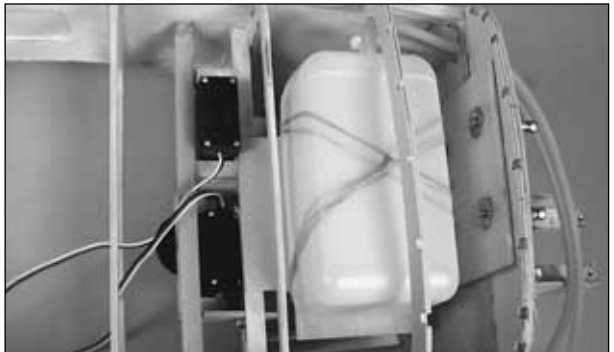
❏ 12. Spread a thin film of 30-minute epoxy on one side of both wing dowel plates and fit them over the dowels protruding through former F2D inside the fuse. Accurately mark the location of the plates on F2D.


❏ 13. Remove the wing. Clamp the wing dowel plates to F2D with C-clamps. Wipe excess epoxy from the holes if any is present.

## SHEET THE FORWARD DECK

The next several steps will be easier if you remove the engine, engine mount and nose gear from the model.

**Use this photo for the next three steps.**

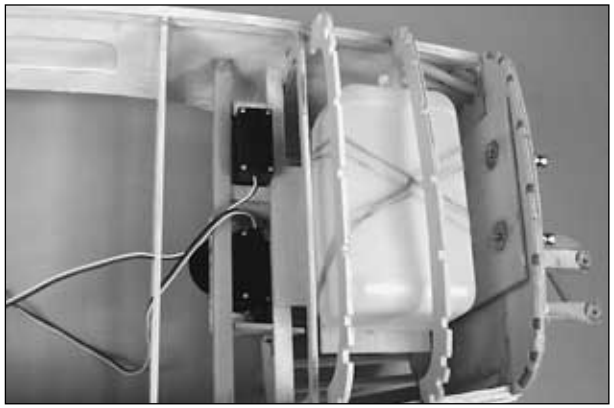


❏ 1. Assemble your fuel tank. Position the tank floor and the tank in the fuselage and determine where to

drill the holes for the fuel lines. Drill the holes with a 1/4" [6.4mm] drill (15/64" [6mm] drill for a better fit). Coat the inside of the fuselage between the firewall and former F2, including the back of the firewall, with fuel proof paint, epoxy or finishing resin. **Note:** The fuel tank is mounted sideways. In a model of this type, this will not create a problem; just don't do any sustained knife edge flight.

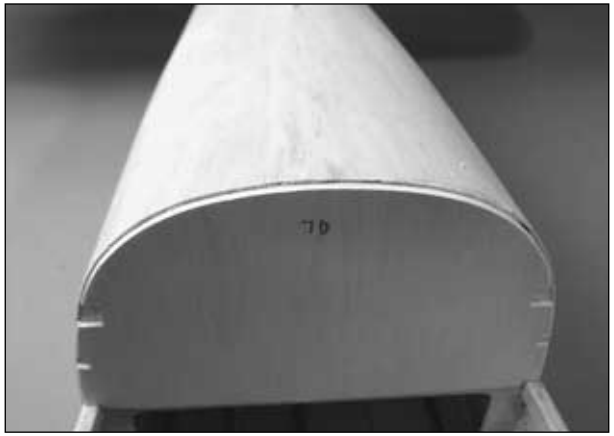
❏ 2. Place 1/4" [6.4mm] foam rubber on the tank floor. Secure the tank to the tank floor with the **#32 rubber bands** included with this kit. Install the tank and tank floor in the model and glue it into position with medium CA. The photo at step 1 shows a Great Planes 16 oz tank with former F1A in position. **Note:** Rubber bands deteriorate over time, so you should replace them at least once a year.

❏ 3. Install fuel and vent lines on the tank and route them through the holes in the firewall to the location of your fuel fill valve (see page 57, step 14) and the muffler pressure fitting. Cut them a couple of inches longer than needed. **Note:** In the future, when the tank needs maintenance, cut the top part of F2 away so the tank can be removed. You will also need to remove the front canopy, which we mounted with screws on our prototype.

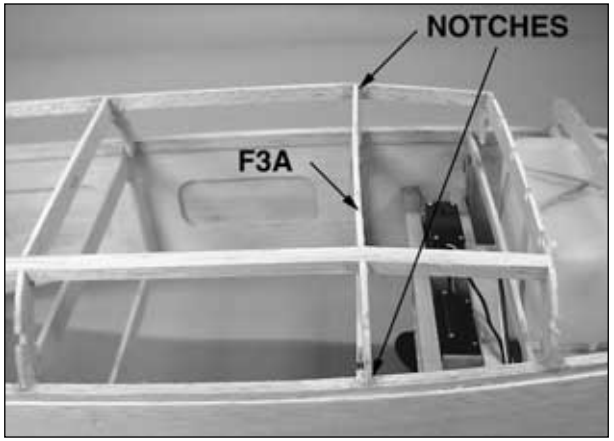


❏ 4. Glue the die-cut 1/8" [3.2mm] plywood formers **F1A** and **F2A** in place as shown on the plan. F1A is positioned 2" [51mm] forward of F2. F2A is positioned 3/16" [4.7mm] forward of F2.

❏ 5. Glue the die-cut 1/8" [3.2mm] plywood formers **F3A** through **F6A** in place as shown on the plan. The formers are glued to the front of its corresponding former. If you previously cut slots for the servo wires in F3, F4 and F5, then cut the needed slots in F3A, F4A and F5A.



❏ 6. If you have not already sanded the turtle deck to shape then do so now. Remember, sand the 1/16" [1.6mm] balsa carefully. Fit the die-cut 1/8" [3.2mm] plywood former **F7D** to the front of F7A. Sand the edges of F7D so that there is a lip the thickness of the canopy. When you are satisfied with the fit, glue F7D to F7A.

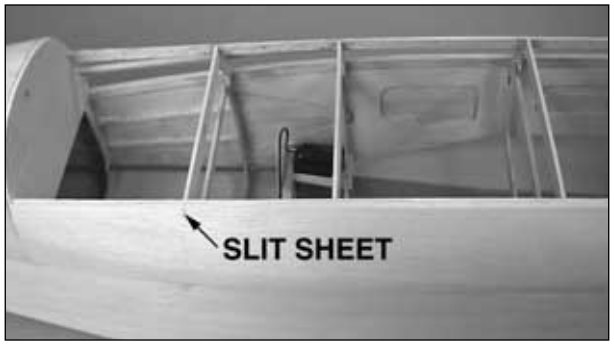


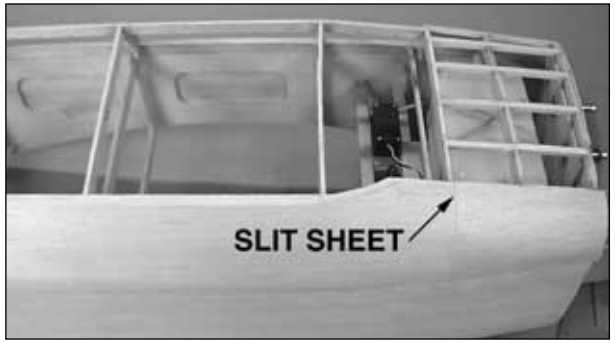

❏ 7. Make the **canopy base** from two 1/4" x 3/8" x 36" [6.4 x 9.5 x 915mm] balsa sticks. Cut them to fit between F2A to F7D. The sticks angle down between F2A and F3A so you will need to cut a notch in the stick at F3A. Glue the sticks in place, making sure they are firmly seated in the notches in the formers, especially at F7D.

**T-34B Fact:** One of the Navy's Mentors accumulated over 5,000 hours of flying time - a lot of time for a military aircraft. This aircraft had done nearly 16,500 landings, 18,000 stalls, 3,400 spins and 4,600 loops. The Navy decided to test the service life of the airframe and after 15,000 hours of testing the Navy declared that the T-34B had no airframe life limit.

❏ 8. Cut **stringers** from 3/16" x 3/16" x 30" [4.8 x 4.8 x 762mm] balsa sticks to fit from the firewall to F7D and from the firewall to F2A. Use leftover sticks wherever possible. Glue the stringers into position.

❏ 9. Sand the stringers and canopy base to conform to the contour of the formers.




❏ ❏ 10. Sheet the forward right side of the fuselage using a 3/32" x 3" x 30" [2.4 x 76 x 762mm] balsa sheet. Select the *softest* balsa sheet you have left. Sand the bottom of the sheet as needed to fit the curve of the fuselage side. Start by gluing the sheet in place at the bottom between F3, F4 and F5 with thin CA. Soak the outside of the sheet thoroughly with a mixture of rubbing alcohol and water. Next, bend the sheet over and glue it to F3, F4, F5 the side stringer and the canopy base, holding it in place until the CA cures. Slit the sheet vertically at F6 and continue gluing it in place from F5 to F7 using the same technique. You will need to sand the edges of the vertical slit to fit the slit together. At the front of the fuselage, slit the sheet vertically at F2 and glue it in place in the same manner. You will find this surprisingly easy to do.

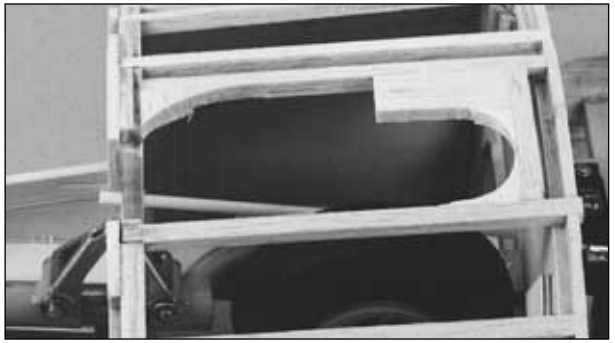
**Note:** The sheeting sticks out slightly where it joins the lower fuselage sheeting. This will be sanded smooth later.

❏ ❏ 11. Use a short piece of 3/32" [2.4mm] balsa sheet and glue it in place on the top of the fuselage from the firewall to F2. The sheet should be trimmed at the center of the center stringer. Note that we traced the shape of the canopy onto the sheeting.

❏ 12. Sheet the other side of the fuselage in the same manner.

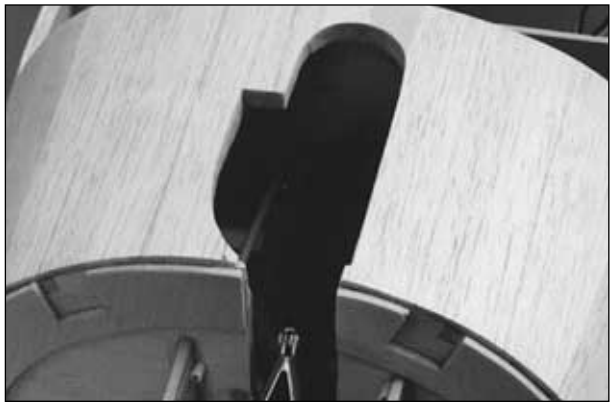
❏ 13. Sand the front of the sheeting even with the firewall. Sand the top even with the canopy base. Sand the sides of the sheeting even with the lower fuselage sheeting.

## SHEET THE FORWARD BOTTOM



❏ 1. If you're installing retracts, turn the fuselage over and build a small *framework* from leftover balsa to support the sheeting around the nose wheel cutout.

❏ 2. Use leftover 1/16" [1.6mm] balsa sheeting to seal around the nose gear between F1 and F2. This will prevent fuel and exhaust residue from entering the fuselage.



❏ 3. Use leftover 3/32” [2.4mm] balsa sheet to sheet the bottom forward fuse, between the firewall and F2. Cut the wheel well for the nose wheel and strut if you are installing retracts.

## FIT THE CANOPY

The canopy is supplied in two parts. It has been designed to be held in place with canopy glue and/or small screws. For better access to the tank, you may want to use small screws for the front of the canopy instead of glue.

It is possible to modify the canopy to be a sliding canopy. You are responsible for any modifications needed.


❏ 1. Cut two 3/16” x 3/16” x 30” [4.8 x 4.8 x 762mm] balsa sticks to a length of 21” [533.4mm] and glue one to each canopy base, along the inside edge. See the "cross section at former F5" view on the plan.

If you are installing the optional cockpit kit (TOPQ8413) in your T-34B, you can skip the next step and follow the instructions supplied with the cockpit kit.

❏ 2. Fit and glue two die-cut 1/8” ply **instrument panels** in place where shown on the plans. Cut a piece from a manila file folder to fill the area between the two instrument panels. Paint the material flat black after it is glued into place.

**Note:** You may want to wait, as we did, until the model is covered and trimmed before fitting the cockpit and canopy to the model.

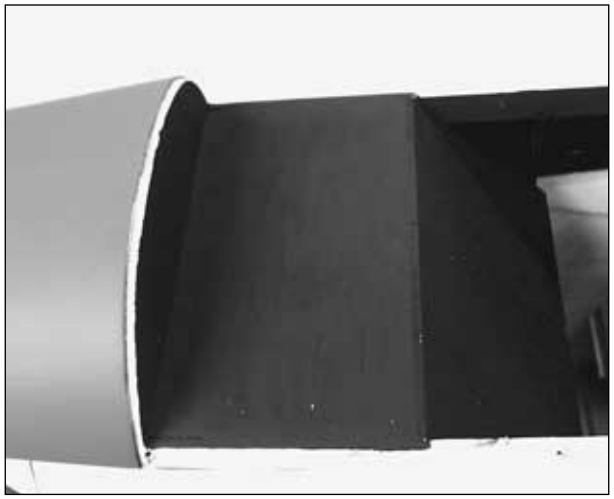
❏ 3. Cut the rear canopy out on the cut lines and fit the canopy into place on the fuselage. We held the rear canopy in place with eight #2 x 3/8” [9.5mm] sheet metal screws.

❏ 4. Cut the front canopy out on the cut lines and fit the canopy into place on the fuselage. We held the front canopy in place with five #2 x 3/8” [9.5mm] sheet metal screws.

❏ 5. Trace the outline of the front canopy on the top of the fuselage with a fine point felt tip marker pen. Remove the front canopy from the fuselage.

If you are installing the optional cockpit kit (TOPQ8413) in your T-34B, you can skip the following steps and follow the instructions supplied with the cockpit kit.

❏ 6. Fit and glue a die-cut 1/8" ply **instrument panel** in place where shown on the plans. Cut a piece from a manila file folder, using the pattern on the plan, to fill the area between the front of the fuselage and the instrument panel. Paint the material flat black after it is glued into place.

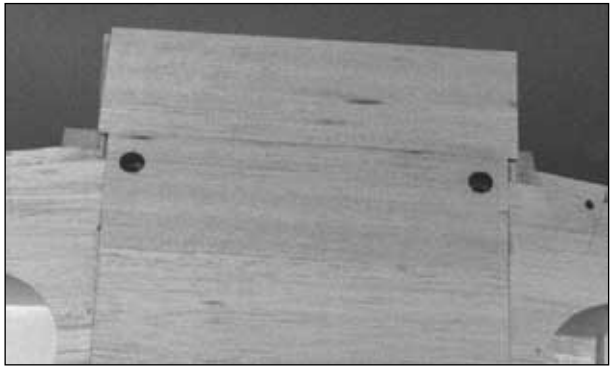


❏ 7. Use some leftover 3/32" [2.4mm] balsa sheeting to fill the rear cockpit area as shown on the plan and in the photo above. Paint the area black.

❏ 8. Remove the top of former F5 to make room for your pilots. We used 1/4 scale Williams Brothers pilots (the 1/5 scale pilots were undersize) and glued and shaped some balsa to the bottom of the pilot so it would extend lower into the fuselage. The pilots are glued to some 1/4" x 3/8" [6.4 x 9.3 mm] basswood sticks.

## SHEET THE BOTTOM OF THE WING CENTER SECTION

❏ 1. Install your servo extension cords, "Y" connectors and air lines if you are installing retracts. The servo extension cords don't have to be connected to the servos and the air lines don't have to be connected to the retracts but they should be installed so you can finish the sheeting. Plan this carefully. Be certain you have connected both aileron extension cords into the same "Y" connector and both flap extension cords into the same "Y" connector. Give yourself plenty of slack on the wires and air lines so you will be able connect everything after you cover your model.

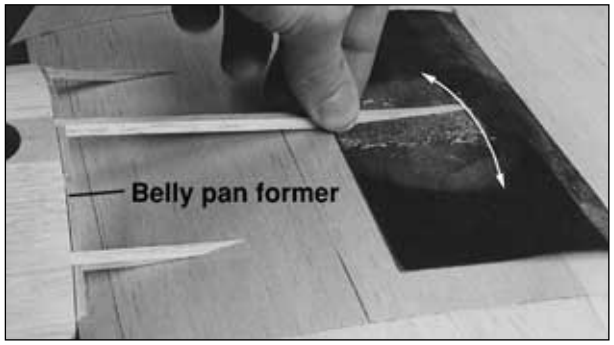


❏ 2. Sheet the bottom of the wing center section with two 3/32" x 3" x 30" [2.4 x 76.2 x 762mm] balsa sheets and leftover 3/32" [2.4mm] balsa if needed. Before you glue the sheet that goes over the wing bolts, first cut two 1" [25.4mm] lengths from the 9/16" [14.3mm] diameter x 8" [203.2mm] **cardboard tube**. Cut holes in the sheeting for the cardboard tubes. Glue that sheet in position with the cardboard tubes. Glue the cardboard tubes to the sheeting and wing bolt plates. After the glue dries, cut and sand the tubes flush with the sheeting.

**Hint:** Temporarily fit the flaps to the wing and cut the ends of the bottom aft sheet to provide the correct spacing at the ends of the flaps.

## MAKE THE BELLY PAN

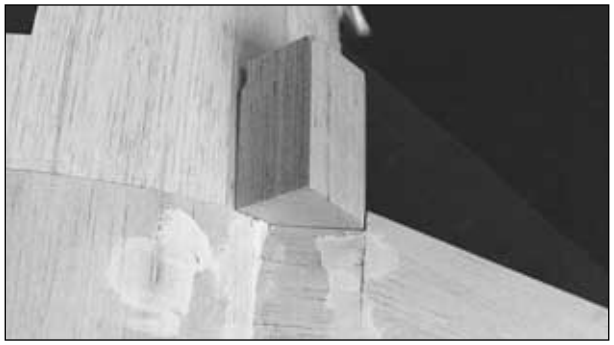
❏ 1. Bolt the wing to the fuselage. Place the die-cut 1/8" [3.2mm] plywood **belly pan former F2W** on the front of the wing so it is resting against fuse former F2. Trim the bottom of F2W so it sits 3/32" [2.4mm] below the bottom fuselage sheeting (to accommodate the belly pan sheeting). Carefully glue F2W to **only the wing**. **Note:** When you glue F2W into place, use some cardboard from a cereal box between F2 and F2W to create a slight space between the formers.



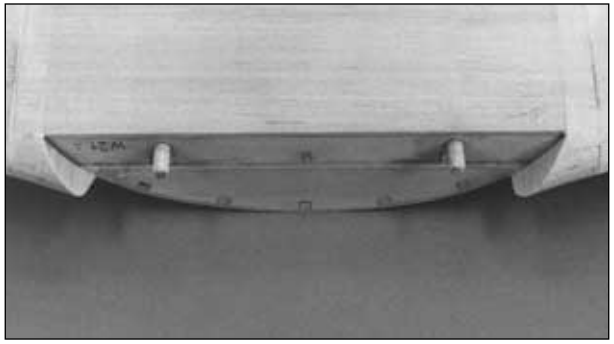

❏ 2. From a 3/16" x 3/16" x 30" [4.8 x 4.8 x 762mm] balsa stick, cut one 6-1/2" [165.1mm] piece, two 4-3/4" [120.7mm] pieces and two 2-1/4" [57.2mm] pieces to make the **belly pan stringers**. Sand one end of the stringers so they conform to the shape of the bottom of the wing. Glue them in position.

**Hint:** Place a piece of sandpaper on the bottom of the wing and move the stringers back and forth, sanding them to the correct shape.

❏ 3. Sheet the belly pan with leftover 3/32" [2.4mm] balsa sheeting. Sand the belly pan to blend with the fuselage. **Feather** the edges where the belly pan meets the wing sheeting with lightweight hobby filler. After the filler dries, remove the wing and sand the belly pan to blend with the wing.



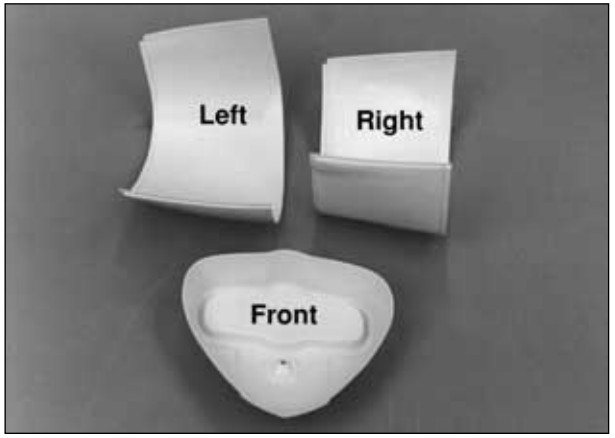
❏ ❏ 4. With the wing off the fuse, sand one of the 1-3/8" x 1-3/8" x 1-1/2" [35 x 35 x 38.1mm] **wing fairing blocks** to match the curvature of the right side of the fuse at the leading edge of the wing. Bolt the wing to the fuse. Sand the side and rear of the wing fairing block so it fits between the wing and the fuse as shown in the photo. Glue the wing fairing block **to the wing only**.

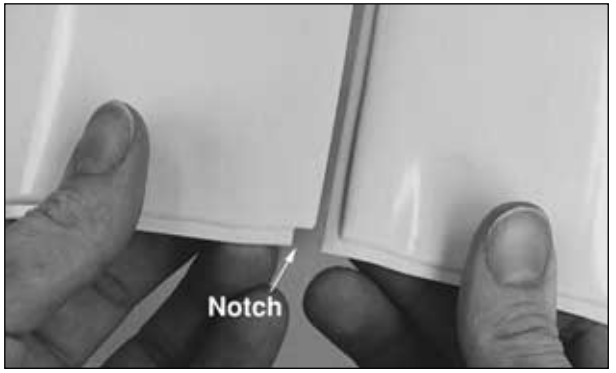


❏ ❏ 5. Remove the wing and sand the wing fairing block to match the shape of the **top** of the wing. The fairing block extends below the bottom sheeting, so blend it to the belly pan and the bottom of the wing with filler. Shape and fit the other fairing block the same way.

❏ 6. Use lightweight hobby filler to blend the belly pan to the wing and sand it smooth after it dries.

## BUILD THE COWL

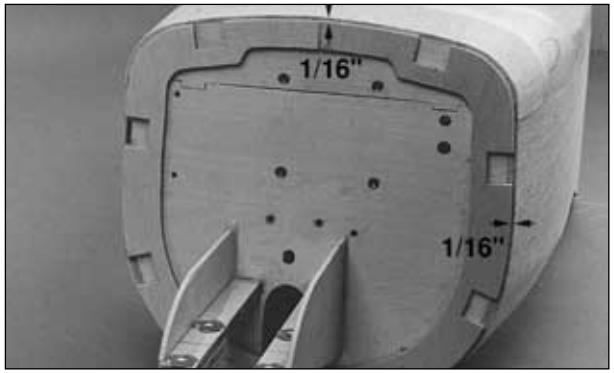


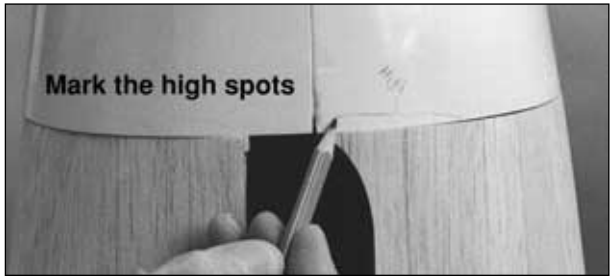

❏ 1. Cut the molded ABS **cowl left side, right side,** and **front** along the cutlines (seen from the inside). Cut a *notch* in the top of the right cowl half and the bottom of the left cowl half so the lap joints do not interfere. On the **aft edges** of the right and left cowl sides, cut about 1/8" [3.2mm] aft of the cutlines. This gives you a little extra material to work with so you can accurately fit the cowl to the fuse. Cut the openings in the front of the cowl. If you have one, use a rotary hand tool with a cutting burr followed by a sanding drum. Sand the edges so they are straight and even.

❏ 2. **Thoroughly** sand all areas that are to be glued, including a 1/2" [12.7mm] strip along the inside edges of the cowl, so the fiberglass reinforcement tape will stick.

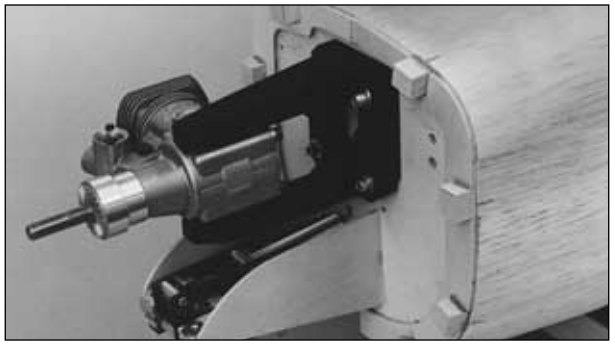
❏ 3. Tape the cowl together with masking tape. Test fit the cowl to the fuse. Glue the seams with thin CA.



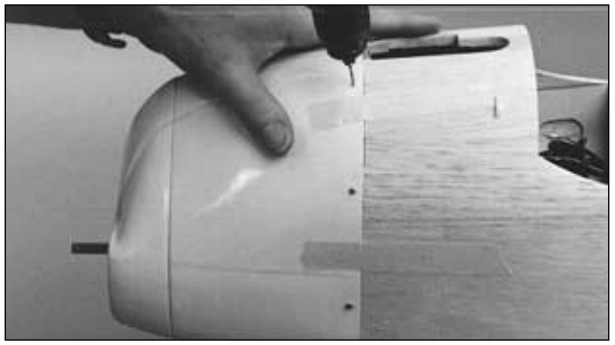

❏ 4. Test fit the die-cut 1/8" [3.2mm] plywood **cowl rings** on the firewall. If necessary, sand the edges of the cowl rings so they are inset from the edges of the balsa fuselage sides approximately 1/16" [1.6mm]. Glue the cowl rings to the firewall.




❏ 5. With the engine mounted, fit the cowl to the fuselage. Mark the *high spots* on the aft edge of the cowl where you need to remove material so it accurately fits the fuselage and aligns with the backplate of your spinner. At first the cowl will be too long but as you *zero-in* on the fit, place the backplate of your spinner on your engine to help you align the front of the cowl. This is a *cut-and-fit* procedure that takes a little time, but it's one of those areas where you can really show your craftsmanship. Take your time and remove small amounts of material at a time.
**Note:** If the head of the engine, the needle valve or carburetor interferes with the cowl, remove them for the time being. We also had to grind a small area on the corner of the nose gear retract unit.



❏ 6. Test fit eight 1/2" x 1/2" x 5/8" [12.7 x 12.7 x 15.9mm] maple **cowl mount blocks** in the notches in the cowl ring. Sand the blocks so they match the shape of the cowl. Glue them in place. Mark the center of each cowl mount block on the fuselage. Test fit the cowl to the fuselage to make sure none of the blocks interferes with the cowl.



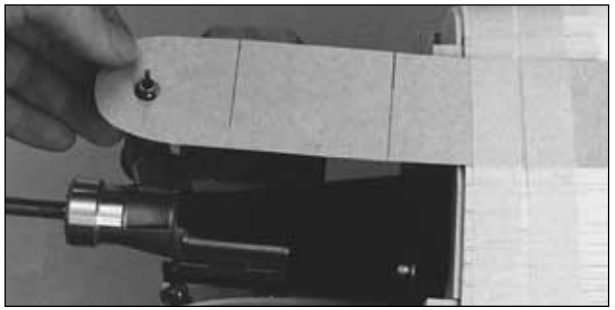
❏ 7. Securely tape the cowl to the fuselage. Using the marks as a guide, drill 1/16" [1.6mm] holes through the cowl and the cowl mount blocks 1/4" [6.4mm] in front of the aft edge of the cowl.

**Hint:** After you drill each hole, screw in a #2 x 3/8" [9.6mm] screw to keep the cowl accurately aligned as you proceed.

❏ 8. Remove the cowl and enlarge the holes **in the cowl only** with a 3/32" [2.4mm] drill bit.

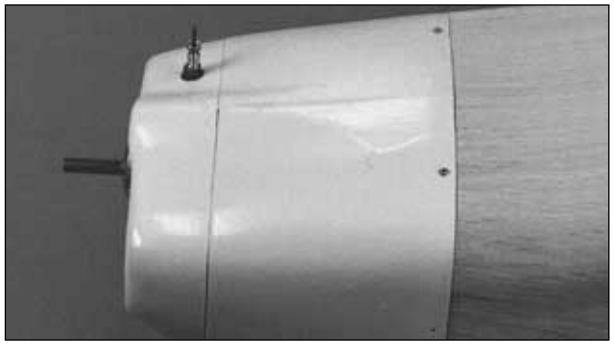
❏ 9. Test fit the cowl to see how it fits. Use #2 x 3/8" [9.6mm] screws to hold it in place.

❏ 10. If you have fixed landing gear, cut a slot in the bottom of the cowl to clear the landing gear wire. If you have retractable landing gear, remove whatever material is necessary so the retractable nose strut and steering arm will clear the cowl.



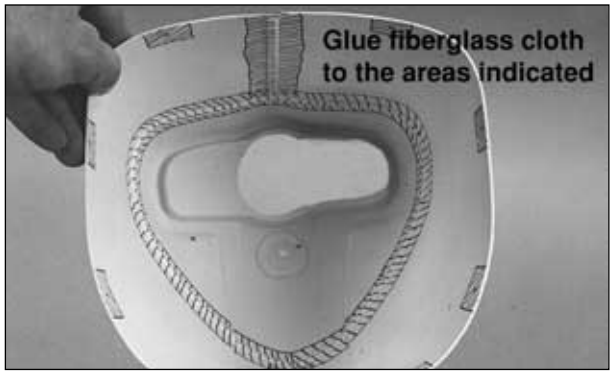
❏ 11. Remove the cowl and make a template out of thin cardboard to locate the needle valve. Tape it to the fuselage.

❏ 12. Replace the cowl on the fuselage and hold it in place with just a couple of the screws. Transfer the hole in the template to the cowl.



❑ 13. Remove the cowl and cut the hole for the needle valve. Start with a small hole. Mount the cowl to the fuselage and check your accuracy. Enlarge the hole while you simultaneously change its position if necessary.

❑ 14. Use the same template method to make holes for the glow plug, exhaust, fueling system and engine head if necessary. The location for the fuel filler valve and retract fill valve are up to you, but we have provided die-cut 1/8" [3.2mm] plywood **mounting brackets** for these items. The head on the SuperTigre .75 **barely** contacted the cowl in one area, so we just ground away that small portion of the fins without any ill effect.



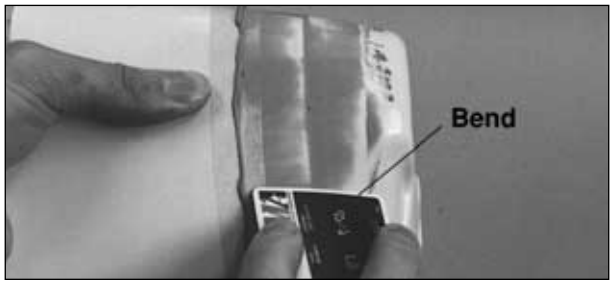

❑ 15. Make sure you have thoroughly sanded the inside seams of the cowl. Use 30-minute epoxy to glue 1" [25.4mm] wide **fiberglass cloth** over all the seams inside the cowl. Add 1" [25.4mm] squares of glass cloth inside of the cowl over the holes for the cowl mount screws. Redrill the holes after the epoxy cures.

❑ 16. Fill the seams in the cowl with Bondo filler. There are other fillers that you can use, but we have found that Bondo works the best. Squadron Green or White putty also works well but it takes longer to dry and shrinks. You could use Squadron putty for smaller parts like the tail cone.

Here are some tips for applying the Bondo to your cowl:
❑ 1. **Thoroughly** roughen all seams and other areas with 150-grit sandpaper where you will apply Bondo.

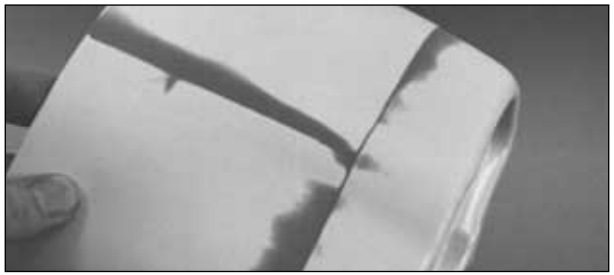
❑ 2. Mix the Bondo **thoroughly** but **rapidly** to allow as much time as possible to apply it.

❑ 3. Bondo cures within a few minutes, so mix only enough to fill one seam at a time.




❑ 4. Use an expired credit card or a piece of plastic as a *spatula* to apply Bondo. Bend your spatula to build up a slight **mound** over the seam.

❑ 5. Apply only enough Bondo to fill the seams and uneven edges. It's easier to apply a second coat than it is to sand *gobs* of it off.



❑ 6. Wet-sanding is best. Start with 150-grit sandpaper. Transition to finer grits as you proceed and finish with 400-grit sandpaper. When you're done your cowl should look something like the one in the photo–just enough Bondo left to fill in the low spots near the seams.

**Note:** If you are installing retracts, the cutout in the bottom of the cowl for the nose wheel will be large enough to allow an adequate air exit for cooling the engine. If you are installing fixed gear you will have to cut openings to allow adequate air exit.

❑ 7. There is a recessed area in the front of the cowl for the taxi light. Cut a **lens** from leftover clear plastic. Glue it in place after the cowl has been painted.

You've come a long way. This is the end of the construction portion of the model so there's no more woodwork. It's all just details and other last minute stuff before your T-34B will be ready to paint and cover!

# FINISHING

## FUELPROOFING

You may fuelproof your model before or after you cover it. Fuelproof all areas that may be exposed to fuel or engine exhaust such as the wheel wells, wing bolt recesses in the wing, the firewall, fuel tank compartment, the front of the belly pan and former F2 in the fuse, etc. Use thinned 30-minute epoxy, finishing resin or fuelproof model paint.

**Note:** Fuelproof the wheel wells and flap wells **before** you cover the wing. Otherwise, the paint may soak through the balsa and add blemishes to your covering.

## COCKPIT DETAILS

If you have decided to install the Top Flite Beechcraft T-34B Scale Cockpit Kit, you may do so at any time, but some fitting and maneuvering is required so we recommend you install it before you cover and paint your model. It is not necessary to permanently install the interior kit at this time, but you should at least fit it and prepare it for painting. Refer to the installation instructions included with the Scale Cockpit Kit.

## SCALE DETAILS

This is the fun part (if you're not staying up late rushing to get your model finished for competition). There are many scale details you can add to your T-34B that will really bring it to life.

**Antennas**
We added the antennas as shown on our documentation and photo package. The antenna bases were carved from wood, then primed and painted white. Use maple, basswood, or a similar dense grain hardwood. Drill a 1/16" hole for antennas made from 1/16" brass tubes. When your scale details are finished, mount them to your model with double-sided tape, or 1/16" double-sided foam tape, or rubber cement. We recommend that you do not permanently mount the antennas to your model, so you can replace or repair them in case of hanger rash (or, well...you know).

### *FINAL SANDING*

Nearly all imperfections in your wood structure will show through the covering. Make one last check of the entire structure. Repair dings or scratches with filler. Sand all surfaces with progressively finer grits of sandpaper.

## *COVER YOUR MODEL WITH MONOKOTE FILM*

We used Top Flite Yellow MonoKote (TOPQ0203) on our prototype T-34B Mentor. The green trim was painted with Parma Faskolor Fasgreen (PARR4005).

It is assumed that you are an intermediate to advanced modeler, so we won't go into many details on covering techniques, but here are some tips you should consider:

1. Most importantly, **NEVER CUT THE COVERING DIRECTLY ON THE SHEETING**. The T-34B depends greatly upon the sheeting for its strength. Modelers who do this tend to cut into the sheeting and this will weaken the structure.

2. Remove all dust from the structure with a vacuum with a brush attachment, compressed air or a tack cloth.

3. Use a Top Flite Hot Sock to minimize dents in the wood from the iron.

4. Some modelers have three irons going at once: one on high heat without a Hot Sock for stretching the covering around curves like wingtips; one on medium heat with a Hot Sock for bonding the covering to large sheeted areas like the wing and stab; and a Trim Iron for small areas.

5. When you cover large sheeted surfaces such as the wing, bond the covering in the middle and work outward pushing out air as you proceed. Do not move the iron in a circular motion but move it span-wise with the grain of the wood.

6. When you cover smaller parts with square edges such as the elevators and ailerons, cover the ends with separate pieces first. Then all you have to do is wrap the covering around the top and bottom and iron it down.

7. When you cover sharp junctions like where the stab meets the fuse, cut narrow strips of covering (3/8" to 1/2" [9.6 to 12.7mm]) and apply them in the corners **before** you cover the major surfaces. The larger pieces of covering will overlap the smaller pieces. This technique also eliminates the need to cut the covering after it has been applied.

**Recommended Covering Sequence:**

**Fuselage**
- ❏ 1. Tail junction strips as described above
- ❏ 2. Stab bottoms, then tops
- ❏ 3. Vertical fin right, then left side
- ❏ 4. Fuse bottom aft, then front
- ❏ 5. Fuse sides
- ❏ 6. Turtle deck (may be done in one or two pieces)
- ❏ 7. Front deck aft of cowl

**Wing**
- ❏ 1. Hidden areas and corners such the TE in the flap and aileron area
- ❏ 2. Bottom of center section
- ❏ 3. Bottom of one, then the other outer panel including the wing tips
- ❏ 4. Top of the center section
- ❏ 5. Top of one, then the other outer panel including the wing tips

**Control Surfaces**
- ❏ 1. Ends, bottoms, then tops of elevators, flaps and ailerons
- ❏ 2. End and bottom of tip, then one side, then the other side of the rudder

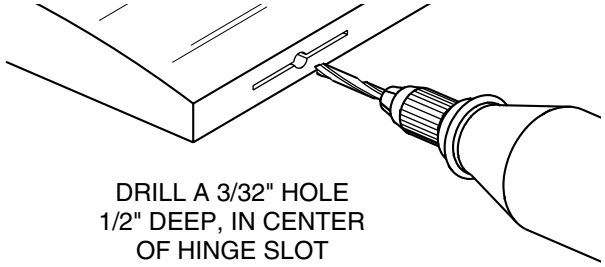
- ❏ 3. Flap and aileron servo hatch covers

## PAINTING

At this stage all your plastic pieces should have the seams filled with Bondo or putty. Spray all the molded plastic parts and scale accessories with at least one coat of primer. We used Top Flite LustreKote® on just about everything that needed to be painted. Wet-sand between coats with 400-grit sandpaper. Use Great Planes 1/8" [3.2mm] EZ-Mask™ Flexible Masking Tape (GPMR1000) for masking fine lines, Kyosho® Masking Cover Sheet (KYOR1040) for quickly masking large areas, a tack cloth to remove dust just before paining, and LustreKote paint for a MonoKote matching finish.

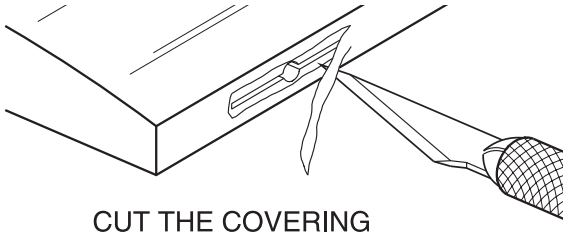
For painting the pilots we recommend acrylic water base paints such as the types found in craft stores. This type of paint looks great on a pilot because it is not glossy, and best of all, it cleans up with water.

## JOIN THE CONTROL SURFACES



DRILL A 3/32" HOLE
1/2" DEEP, IN CENTER
OF HINGE SLOT

❏ 1. Drill a 3/32" [2.4mm] hole 1/2" [12.7mm] deep in the center of the hinge slots on the stab and elevators. A high speed Dremel Tool® with a cutting burr works best for this, but you can use a drill or a sharpened brass tube instead.

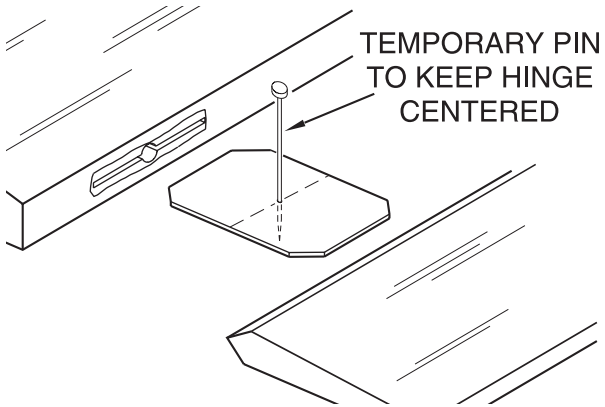


CUT THE COVERING
AWAY FROM THE SLOT

❏ 2. Remove a small strip of covering from the hinge slots on the stab and elevators.

❏ 3. Roughen the ends of the joiner wire that goes into the elevators with sandpaper.

❏ 4. Fit the hinges in only the stab or elevators (without glue). Fill the joiner wire holes in the elevators with 30-minute epoxy. Install the joiner wire in the elevators. Wipe away excess epoxy with a cloth dampened with alcohol.




❏ 5. Join the elevators to the stab with the hinges. If necessary, insert a pin in the center of the hinges to keep them centered in the elevator and stab. Make sure there is approximately a 1/64" [0.4mm] gap between the elevators and the stab so you do not glue them together.

❏ 6. Cut a paper towel into 2" [50.8mm] squares. Add six drops of thin CA to the center of the hinges on **both the top and bottom**. Use the paper towel squares to absorb excess CA from the hinge gap before it cures.

**Do not use CA accelerator on any of the hinges and do not glue the hinges with anything but thin CA. Do not attempt to glue one half of the hinge at a time. The hinges will not be properly secured and could come out while the model is in flight.**

❏ ❏ 7. Use the same hinging method to join the rudder to the fin and the ailerons to the wing.

❏ ❏ 8. Thoroughly roughen the flap hinges with coarse sandpaper. Mix enough 30-minute epoxy to do one flap at a time. Use a piece of leftover wire to thoroughly coat the holes in one of the flaps and the holes in the wing with the epoxy. Coat one side of the flap hinges with epoxy and insert them into the wing. Coat the other side of the hinges with epoxy and join the flap. Wipe away excess epoxy before it cures.

❏ ❏ 9. Position the flap and the hinges so the flap is centered and fits the wing. Tape the flap in place until the epoxy is fully cured.

❏ 10. Join the other flap to the wing the same way.

❏ 11. Reinstall any pushrods you may have disconnected while covering, and mount the control horns to the ailerons.

## MAKE THE PANEL LINES

Use a Top Flite Panel Line Pen (TOPQ2510) to draw the panel lines and hatch outlines or use a Top Flite Smart Stripe™ (TOPR2420) to cut narrow strips of MonoKote Film and iron them on. If you use the Panel Line Pen, use a straightedge with a few pieces of masking tape stuck to the underside of the straightedge to keep the ink from wicking underneath it. Use the Top Flite Scale Template for rivets, hatches, fuel caps and other details. Some

cleaners will remove the ink lines so test your cleaner before you spray it on your model. You can remove mistakes with alcohol. You'll need to touch up some of the lines from time to time because they fade with lots of handling and fuel spillage.

## APPLY THE DECALS

The decal sheet provides the detailing and difficult items shown on the box photo for you to trim your model.

❏ 1. Study your documentation package and the photos on the box to decide where to place the decals.

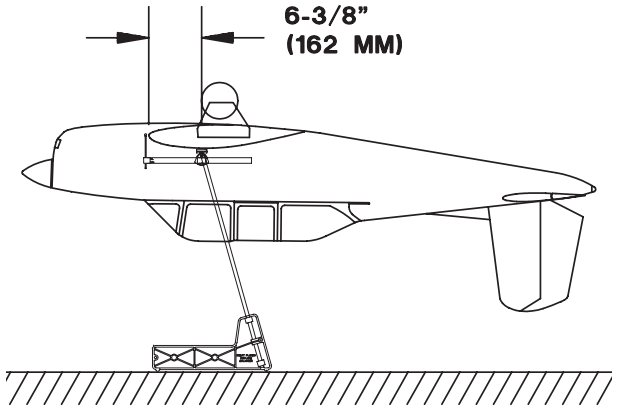
❏ 2. Clean your airplane very thoroughly before applying decals.

❏ 3. Cut out the decals and carefully apply them to your model. You can float the decals into position by first applying soapy water (just a teaspoon of dish detergent to a quart of water) to the model's surface. Squeegee out the water and soap with a piece of soft balsa or a credit card wrapped with a tissue. Blot the surface dry and let the decal cure for at least 12 hours before running the engine.

# GET YOUR MODEL READY TO FLY

## 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.**




❏ 1. See the Hot Tip that follows to 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 6-3/8" (162 mm) back from the leading edge at the wing root where it meets the fuselage side, as shown in the sketch and on the plan. This is the balance point at which your model should be balanced for your first flights. Later, you may experiment by shifting the balance up to 1/2" [12.7mm] forward or 1/4" [6.4mm] back to change the flying characteristics. If you move the balance point forward it may improve the smoothness and tracking, but your T-34B may then require more speed for takeoff and become more difficult to slow down for landing. If you move the balance aft it may make the T-34B more agile with a lighter feel and allow you to slow the model more for landing. In any case, please start at the location we recommend and do not at any time balance your model outside the recommended range.

HOT TIP

### HOW TO MARK THE BALANCE POINT

The balance point is measured from the **center leading edge**. Since the center section of the wing is not visible when the wing is on the fuse, you need to mark the balance point outward a few inches so you can see where to lift the wing when it's bolted to the fuse. To do this, mark the balance point with a felt-tip pen or tape on **both ends** of the center section. Place a straightedge across the marks. Mark the balance point along the straightedge further out on the wing. Mount the wing to the fuselage.

❏ 2. Temporarily place your receiver and battery pack inside the fuselage where you plan to mount them, or lay them on the fuselage over the location you plan to mount them. This is so you can change the mounting location of the battery pack or receiver to change the C.G. without adding any additional nose or tail weight. Otherwise, all other components should be in the model and it should be in a ready-to-fly condition with the fuel tank **empty**. If you have installed retractable landing gear, the nose gear should be retracted.

❏ 3. With the wing attached to the fuselage, lift the model, inverted, at the balance point. We use the Great Planes C.G. Machine™ (shown in the sketch) for this. If the tail drops, the model is tail heavy and you must shift your battery pack or other components forward or add weight to the nose. If the nose drops, it is nose heavy and you must shift your battery pack or other components aft or add weight to the tail. In order to save weight, relocate your battery pack and/or receiver or other components before you add additional weight to arrive at the correct C.G. You may easily install nose weight by

using a spinner weight or gluing lead weights to the firewall. You may add tail weight by sticking on Great Planes (GPMQ4485) stick-on lead weights on the bottom of the fuselage under the tail. Later, if the balance proves to be OK, you can open the fuse bottom and glue these in permanently. Never stick weights to the cowl because it is not designed to support weight.

Our prototype model required 7-1/2 ounces of lead on the firewall. **Do not** trust the adhesive on the stick on lead weight. Use epoxy or screws to hold the weight in place.

**Warning**: Some modelers who built the Top Flite Bonanza reported that the model was very pitch sensitive when it was powered with an engine in the upper end of the recommended size range. If you are using a large engine, balance the T-34B at the forward end (nose heavy) of the recommended CG range for the first flights. You can then adjust the CG further aft as you become comfortable with the model. **Do not** exceed the recommended control throws.

## BALANCE THE AIRPLANE LATERALLY

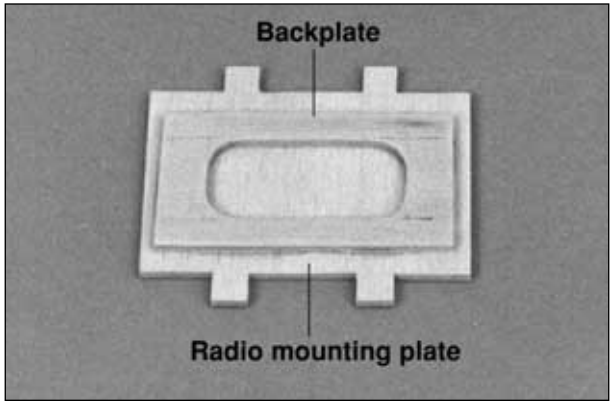
❏ 1. Mount your wing.

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

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

### *INSTALL YOUR RECEIVER, BATTERY PACK AND RETRACT COMPONENTS*

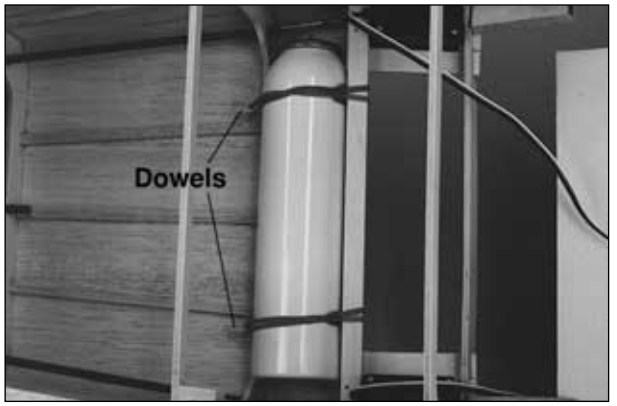
The location of your receiver and battery pack may be determined by the C.G. On our prototypes we mounted the battery pack and receiver nearly as far forward as possible. You may use the mounting plates provided with this kit or fashion your own method to secure your battery pack and receiver.




❏ 1. **Securely** glue a die-cut 1/8" [3.2mm] plywood **backplate** to the die-cut 1/8" [3.2mm] plywood **radio mounting plate**.

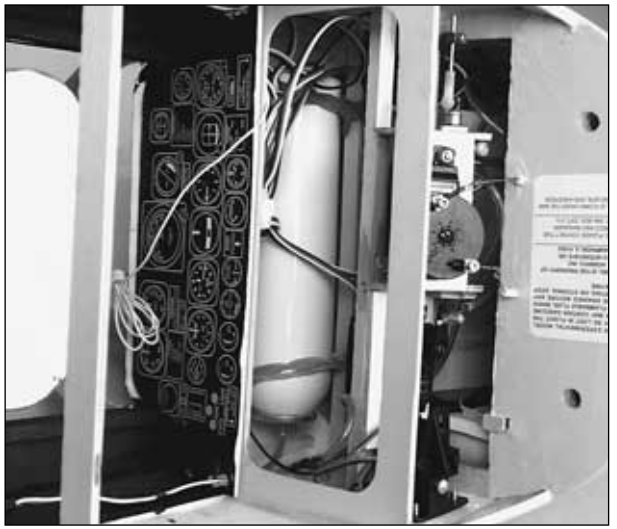
❏ 2. Secure your battery pack to the mounting plate with a few rubber bands and 1/4" [6.4mm] thick foam rubber in between. Test fit the battery pack and mounting plate in the front of the fuse as shown on the plan. **Securely** glue the backplate to the fuse side doubler. **Note:** You may need to remove the top of former F2 to install the mounting plates.

❏ 3. Install your receiver the same way. Route your receiver antenna through the antenna tube. **Note:** If in the future you have to remove, then reinstall your receiver or battery pack, first hook the rubber bands to the tabs on the mounting plate. Next, stretch the rubber bands and slide your battery pack and receiver underneath.




❏ 4. Cut the two 1/8" x 1" [3.2 x 25.4mm] dowels to a length of 3/4" [19.1mm]. Glue the dowels into the holes you drilled in the bottom of former F6. Cut the aft edges of the servo trays so they are even with the servo rails. Temporarily strap the air tank in place using two rubber bands.

**Note:** There is also room behind the front instrument panel to install the air tank. It can be held in position with silicone adhesive or rubber bands. Refer to the next photo.




❏ 5. Mount your air control valve and servo. On our prototype we mounted the air control valve to the right nose steering servo tray. Mount yours the same way or find an alternate location. Mount the servo to two rails made from leftover 1/4" x 3/8" [6.4 x 9.6mm] basswood.

**Note:** It will be easier to connect your air lines to the air control valve **before** you mount the air control valve in the airplane.

❏ 6. Mount your on/off switch and charge jack in a location where it will not get covered with engine exhaust residue. We used the Great Planes Mounting Set (GPMM1000).

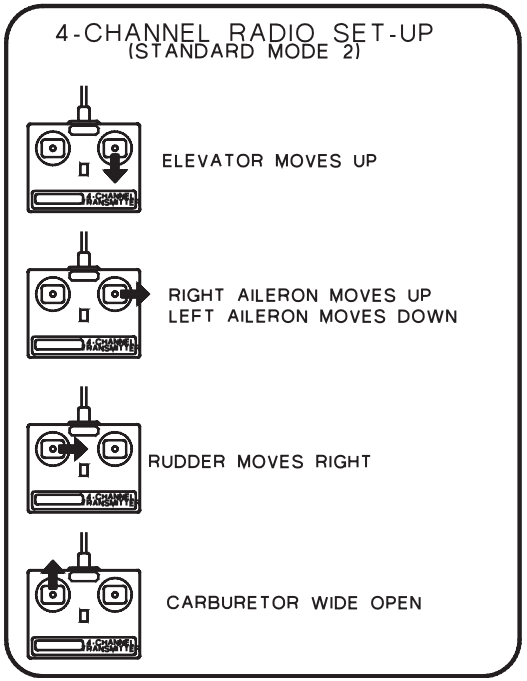
❏ 7. Connect your battery pack, receiver, switch and servos. Connect the air lines to your air tank with a "T" fitting connected to your air fill valve. If you are installing the Cabin Interior, route the air lines and servo cords through notches in the formers.

❏ 8. Recheck the C.G.

❏ 9. If you haven't already centered your servos, take the servo arms off all the servos and turn on your transmitter and receiver (this is most important for the flaps). Center the trims and put the servo arms back on your servos and secure them with the screw.

❏ 10. While you're at it, double-check all the servos and make sure the servo arms are secured and all the clevises have a silicone retainers.

❏ 11. Make sure the control surfaces move in the proper direction as illustrated in the following sketches.




❏ 12. Adjust your pushrod hookups and set up your radio to provide the control surface movements as follows.

***CONTROL SURFACE THROWS:***

We recommend the following control surface throws:

**Note:** Throws are measured at the widest part of the control surface.

| | High Rate | Low Rate |
|---|---|---|
| **ELEVATOR:** | 11/16" up<br>11/16" down | 9/16" up<br>9/16" down |
| **RUDDER:** | 1" right<br>1" left | 3/4" right<br>3/4" left |
| **AILERONS:** | 3/4" up<br>3/4" down | 1/2" up<br>1/2" down |
| **FLAPS:** | Takeoff<br>1" down<br>(50%) | Landing<br>2" down<br>(100%) |

The surface throws and balance point listed in this manual are the ones at which the T-34B flies best. Set up your aircraft to those specifications. If, after a few flights, you would like to adjust the throws to suit your tastes, that is fine. The T-34B has large elevators and does not require much throw. Too much throw can force it into a stall, so remember...More is not better.

# PREFLIGHT

## CHARGE YOUR 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.

## BALANCE YOUR PROPELLERS

Carefully balance your propellers before you fly. An unbalanced prop is the single most significant cause of vibration that can damage your model. Not only will engine mounting screws and bolts loosen, possibly with disastrous effect, but vibration may also damage your radio receiver and battery. Vibration can also cause your fuel to foam, which will, in turn, cause your engine to run hot or quit. We use a Top Flite Precision Magnetic Prop Balancer™ (TOPQ5700) in the workshop and keep a Great Planes Fingertip Prop Balancer (GPMQ5000) in our flight box.

## FIND A SAFE PLACE TO FLY

The best place to fly your model is an AMA chartered R/C club flying field. Contact the AMA (their address is on page 3) or your hobby shop dealer for the club in your area and join it. Club fields are intended for R/C flying, making your outing safer and more enjoyable. The AMA also provides insurance in case of a flying accident. If an R/C flying field is not available, find a large, grassy area at least six miles from buildings, streets, and other R/C activities. A schoolyard is usually not an acceptable area because of people, power lines and possible radio interference.

## GROUND CHECK YOUR MODEL

If you are not thoroughly familiar with the operation of R/C models, ask an experienced modeler to inspect your radio installation and control surface set-up. Follow the engine manufacturer's instructions to break-in your engine. After you run the engine on your model, inspect your model closely to make sure all screws remain tight and your pushrods and connectors are secure.

## RANGE CHECK YOUR RADIO

Ground check the range of your radio before the first flight of the day. 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 an assistant stand by your model and, while you work the controls, tell you what the control surfaces are doing.

Repeat this test with the engine running at various speeds with an assistant holding the model, using hand signals to show you what is happening. If the control surfaces do not respond correctly, do not fly! Find and correct the problem first. Look for loose servo connections or broken wires, corroded wires on old servo connectors, poor solder joints in your battery pack or a defective cell in your battery pack, or a damaged receiver crystal from a previous crash.

## ENGINE SAFETY PRECAUTIONS

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

Store model fuel in a safe place away from high heat, sparks or flames. Do not smoke near the engine or fuel as it is very flammable. Engine exhaust gives off a great deal of deadly carbon monoxide so do not run the engine in a closed room or garage.

Get help from an experienced pilot when you learn to operate engines.

Use safety glasses when you operate model engines.

Do not run the engine near loose gravel or sand; the propeller may throw loose material in your face or eyes.

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

Always be aware and very conscious of hand movements and be deliberate in your reach for the needle valve, glow plug clip, or other items near a spinning propeller.

Keep loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects away from the prop. Be conscious of pencils, screwdrivers or other objects that may fall out of your shirt or jacket pockets.

Use a chicken stick or electric starter and follow the instructions to start your engine.

Make certain the glow plug clip or connector is secure so that it will not pop off or get into the running propeller.

Ask an assistant to hold the model from the rear while you start the engine and operate the controls.

Make all engine adjustments from behind the rotating propeller.

The engine gets hot! Do not touch the engine during or immediately after you operate it. Make sure fuel lines are in good condition so fuel will not leak onto a hot engine and cause a fire.

To stop the engine, close the carburetor barrel (rotor) or pinch the fuel line to discontinue the fuel flow. Do not use your (or any body elses') hands, fingers or any body part to stop the engine. Never throw anything into the prop of a running engine.

# FLYING

The Top Flite Beechcraft T-34B is a great flying sport scale airplane that flies smoothly and predictably, yet is highly maneuverable. Compared to other scale models, its flight characteristics are docile and forgiving. The T-34B also has excellent slow speed flight characteristics. 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 until you are able to safely and competently pilot the model by yourself.

### FUEL MIXTURE ADJUSTMENT

A fully cowled engine may run at a higher temperature than an un-cowled engine. For this reason, the fuel mixture should be richened so the engine runs at about 200 rpm below peak speed. By running the engine slightly rich, you will help prevent dead stick landings caused by overheating.

## 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. This will give you a safety margin in case of a "flame-out." Use as much of the available runway as possible and practical. When the plane has sufficient flying speed, lift off by smoothly applying up elevator (don't "jerk" it off into a steep climb!), and climb out gradually. Do not use flaps for your initial takeoff. After you have the feel of the T-34B, takeoffs may be made with the flaps set at 50%. Never use 100% flaps for takeoff because of the high drag.

## FLIGHT

We recommend that you take it easy with your T-34B for the first several flights, gradually getting acquainted with this realistic model 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 62. High rate elevator may be required for crisp snap rolls and spins. With a 1.20 engine the T-34B really scoots along, so you should manage the throttle when performing high "G" diving maneuvers such as split-esses and loops.

Good throttle management should always be practiced no matter what engine you are using. It's the mark of an accomplished pilot.

## LANDING

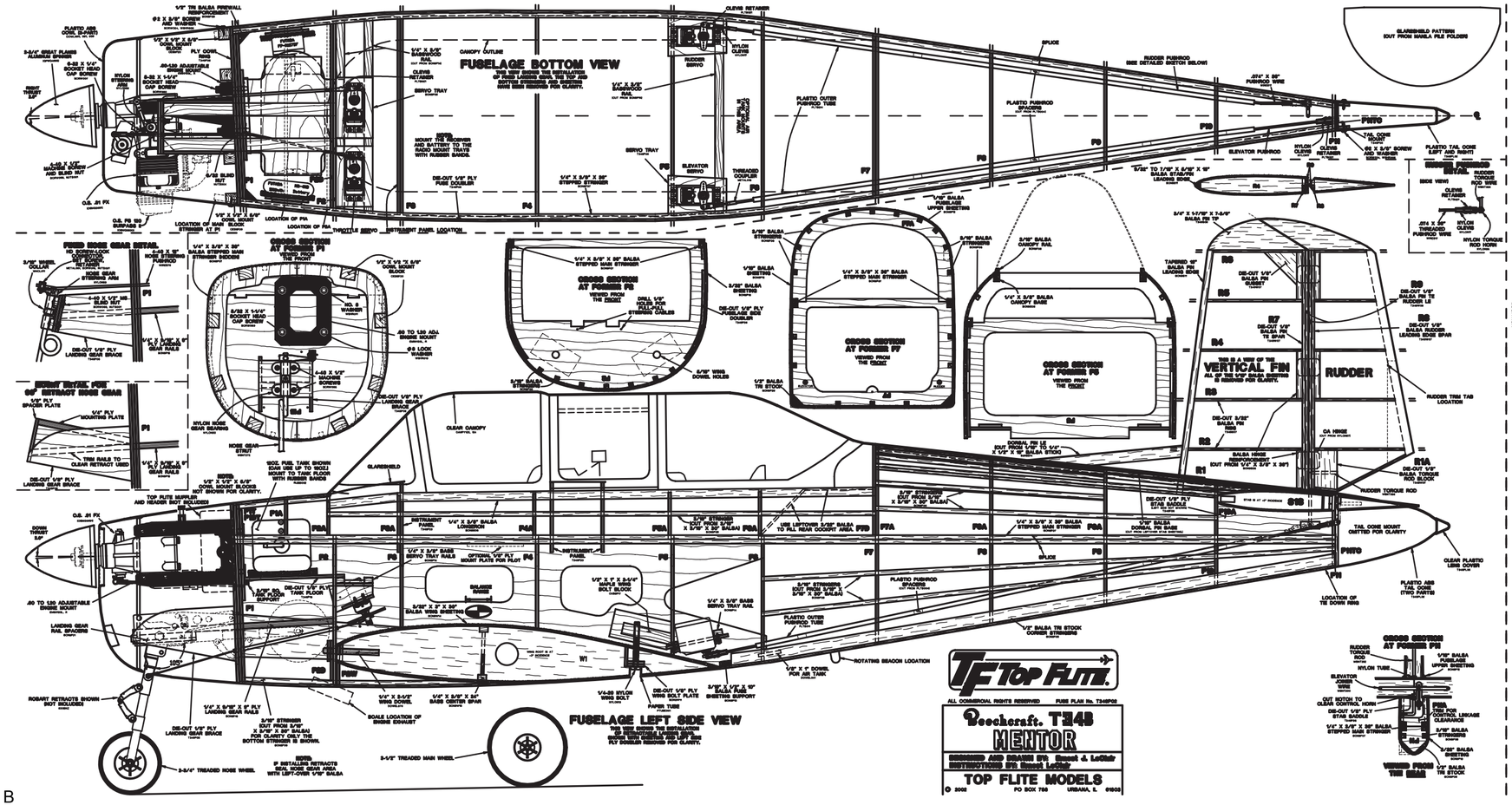
When it's time to land, fly a normal landing pattern and approach. The T-34B may bleed off airspeed more rapidly than the sport planes you are used to, but it still tends to float once it enters ground effect. For this reason, be prepared to add a little power during approach and touchdown. For your first landings, plan to land slightly faster than stall speed and flare a few inches off the runway onto the main wheels.

## FLAPS

Full flaps make the T-34B very steady in the landing pattern. Just carry a little extra power to make up for the increased drag. This drag allows you to make shorter, steeper approaches. Touch down with a slightly nose-high attitude to avoid letting the nose gear contact the runway first. You can execute touch-and-go's and slow flyby's with full flaps, but be ready to use a little more up elevator. You should use only half flaps for taking off and climbing because the plane will accelerate and climb much better than it would with full flaps. If you have to attempt a go-around, your first priority should be to smoothly apply power and establish a steady climb. After you reach a safe altitude, reduce flaps, and then make your turn to get back into the landing pattern.

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

GOOD LUCK AND GREAT FLYING!

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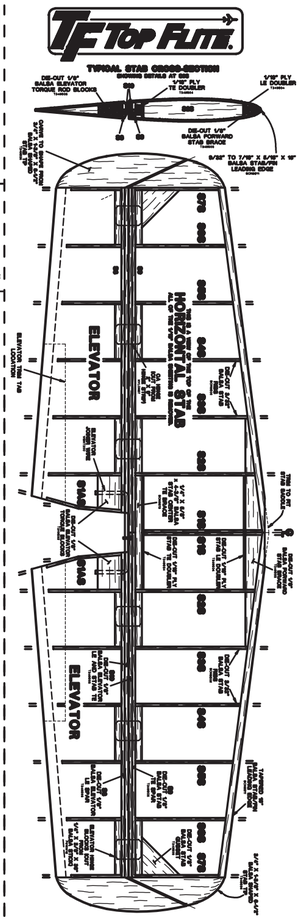


Cut this placard out, fill it in and place it inside your model.

This model belongs to:

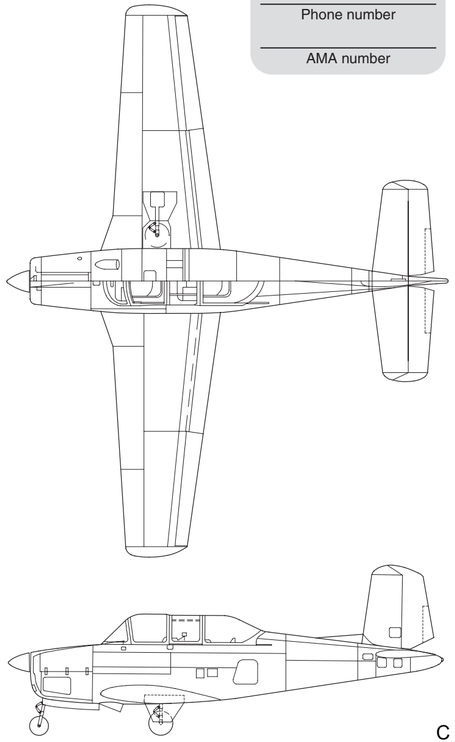
Name

Address

City, State Zip

Phone number

AMA number



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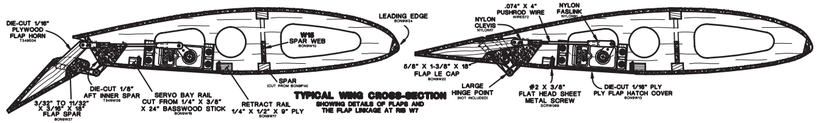





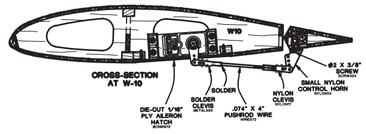








 WING PLAN No. T34BP01

**SPECIFICATIONS**

| | |
|---|---|
| WING SPAN | 80" |
| WING AREA | 1020 sq. in. |
| WING LOADING | 22.5-31.5 oz./sq. ft. |
| WEIGHT | 10 to 14lbs. |
| ENGINE | .60-.91 2C .90-1.20 4C |
| RADIO | 4-6 CHANNELS |

Beechcraft. T34B
MENTOR

DESIGNED AND DRAWN BY: Ernest J. LoCiair
INSTRUCTIONS BY: Ernest LoCiair

TOP FLITE MODELS

 PO BOX 788 URBANA, IL 61803

D A