# BUMBLE-VEE

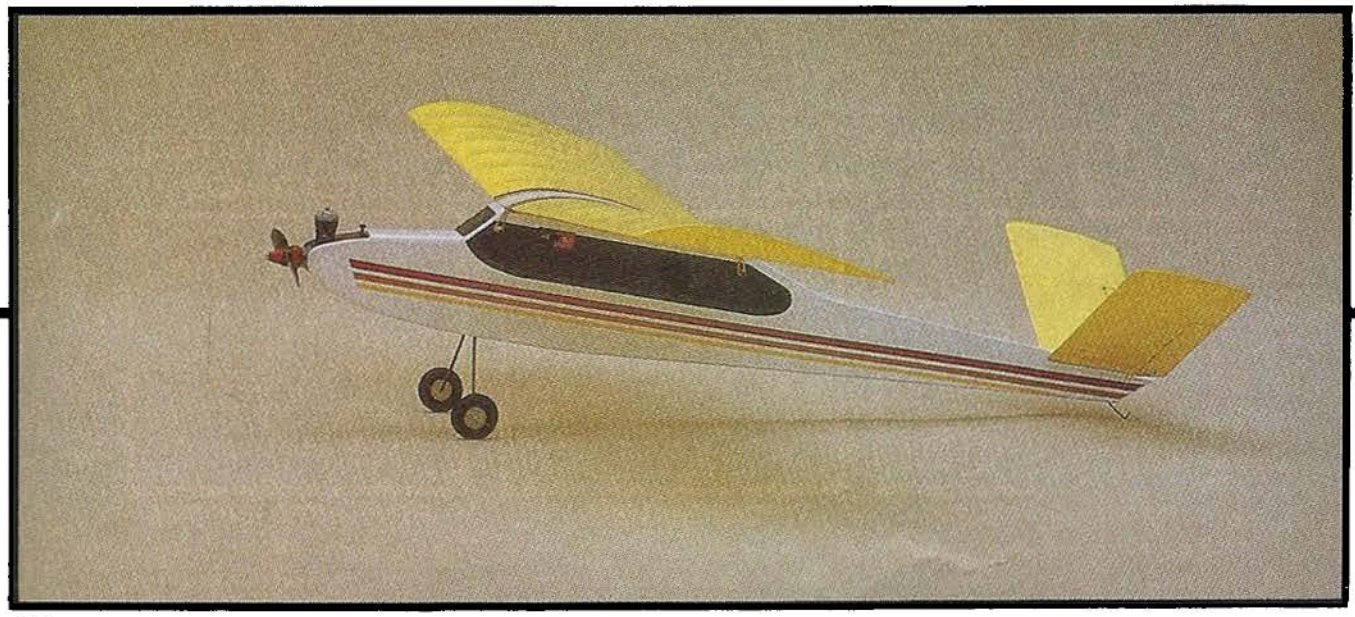
**By Henry Arance**

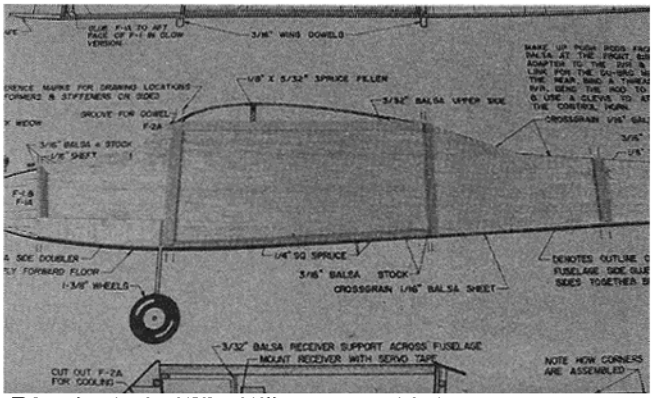
**Designed for a break from the normal routine, this model will inject some fun into the hobby as well.**

Everyone likes to have fun. Personal enjoyment and satisfaction are what this hobby is all about. Unfortunately, sometimes we get so wrapped up in R/C that we forget it's supposed to be a fun hobby. I wanted to design an airplane that would be an enjoyable break from the normal routine and inject some fun into the works at the same time. That's where the Bumble-Vee comes in. The Bumble-Vee has one mission; to be fun! Once you have one you'll agree it fulfills that mission amazingly well.

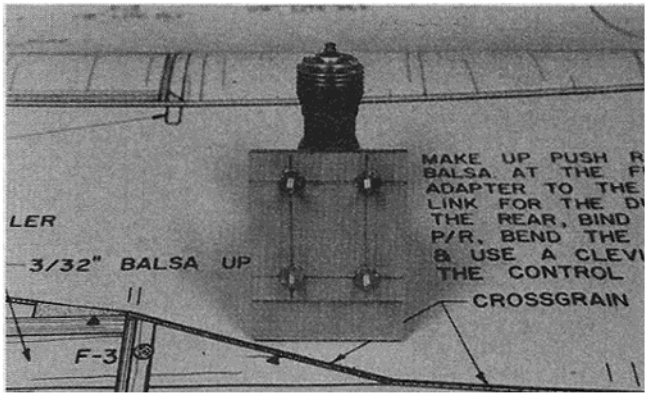
The size of the Bumble-Vee is small to keep things simple and inexpensive. A 1/2A airplane will fly almost anywhere, making it easy to sneak away for a half an hour flying session. The structure on a small plane is simpler, faster building and less expensive than one on a larger model. A two channel airplane means a less expensive radio set-up is required. And nothing is cheaper to obtain or feed than a 1/2A engine.

The Bumble-Vee was designed to look different. The V-tail certainly accomplishes that. But the tail is simple to control using a Du-Bro mechanical mixer, so don't let it put you off. The cabin style fuselage means there's plenty of room for






*Triangle stock, 1/8" x 1/4" spruce and balsa doubler glued in place on fuselage side. Be sure to make one left and one right side.*




*F-1A glued to the back of F-1 with engine mounting blind nuts installed.*

standard servos and battery packs — no need for any special radio gear. You put those two design elements together, and nothing this side of a Beech Bonanza comes close to the way a Bumble-Vee looks on the ground or in the air.

In case you aren't convinced yet, there's one more reason to build a Bumble-Vee. It's a terrific way to get your feet wet in the wave of the future — electric power. A basic electric motor and battery combination is now under $40.00, so cost isn't really a restriction. And with motor runs of 5 to 6 minutes on a 6 x 4 prop, performance isn't a problem either. If you've been wanting to try an electric, stop making excuses and build an electric Bumble-Vee.

I couldn't be happier with the Bumble-Vee. It builds fast, is inexpensive, and flies great. To me, that all adds up to fun. So enough talking, get out to your workshop and build your very own Bumble-Vee! And if your final excuse is that you don't scratch-build, forget it. The Bumble-Vee will be kitted in the future by G.M. Precision Products, Inc. If you don't want to cut out your own kit, watch for their ads.

## PRE-CONSTRUCTION

Your Bumble-Vee will build faster and with fewer hassles if you cut out all your parts before building. That way, when you need a part, you simply reach into the box for it instead of stopping everything and scrambling to cut one out. Look over the plans well, once you get them from RCM. The Bumble-Vee is so simple it's almost self explanatory, but the rest of this article will give you an outline to follow.

**Wing:**

The wing can't get much simpler than it is. Pin the balsa T.E. in place over the plans. Using the ribs to set the spacing, pin the spruce spar in position. Don't pin through the spar; use two pins in an "X" to hold it in place.

Glue all the W-1 ribs in place. Use a small square to keep them vertical. Add the W-1A ribs, then glue the L.E. to the front of the ribs. Cut and fit the 1/16" sheeting between the ribs in the first rib bay of each panel.

Install the 1/8" x 5/32" spruce fillers on top of the spar between the W-1A ribs. You'd be surprised at how much these fillers strengthen the center joint. Install the 1/16" balsa top sheeting and the 3/32" gussets.

Sand the entire wing and shape the leading edge. Trim the spars, L.E. and T.E. flush with the outboard ribs. Cut the wing apart at the center and block sand both ends of each panel flush. Glue the 3/4" triangle stock tips in place. Carve them to match the top contour of the wing.

Glue the dihedral wedge to one of the wing panels. Pin that wing to the board and block up the second panel and check for the proper dihedral. When satisfied, join the panels. Wrap the center joint with 2 ounce glass cloth to reinforce it. **Do not omit this cloth.** This completes the wing.

**Stabilizer:**

Cut the stabs and elevons from 1/8" sheet. Round the outside edges and bevel the inboard edge for the stab dihedral. Glue the two stab halves together, blocking them up as shown on the plan.

**Fuselage:**

Make up two fuselage sides, gluing the doublers, spruce stiffeners and triangle stock in place. Glue the 1/16" ply plate to the back of F-1 and install the blind nuts for the engine. Bind the landing gear to F-2 using soft wire and epoxy.

Position your building board so the landing gear will hang over the edge of your bench when you assemble the fuselage. With the right side on the board, install F-1, F-2, F-3, and the windshield block. Use a square to make sure all the formers are perpendicular to the side. Glue the left side to the formers, making sure it is properly aligned.

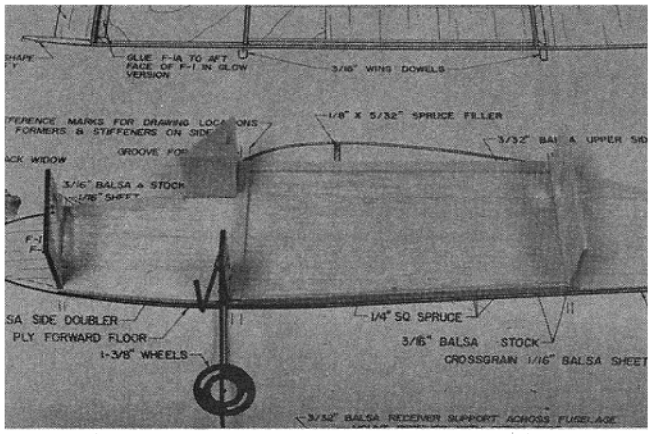
Set the fuselage upside down over the top view. Pull the two sides

**BUMBLE-VEE**

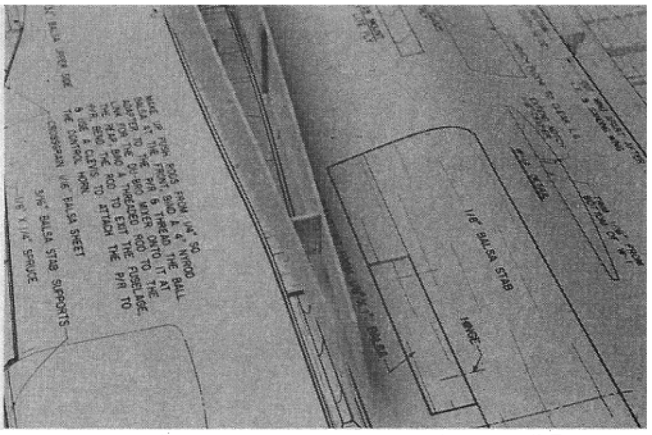
**Designed By:**
Henry Arance
**TYPE AIRCRAFT**
Sport-Glo/Electric
**WINGSPAN**
37 Inches
**WING CHORD**
7½ Inches
**TOTAL WING AREA**
277 Sq. In.
**WING LOCATION**
High Wing
**AIRFOIL**
Flat Bottomed
**WING PLANFORM**
Constant Chord
**DIHEDRAL EACH TIP**
1⅜ Inches
**O.A. FUSELAGE LENGTH**
28⅜ Inches
**RADIO COMPARTMENT SIZE**
(L) 7½" x (W) 1⅜" x (H) 3½"
**STABILIZER SPAN**
15 Inches (projected)
**STABILIZER CHORD (incl. elev.)**
3⅞ Inches
**STABILIZER AREA**
58 Sq. In.
**STAB. AIRFOIL SECTION**
Flat
**STABILIZER LOCATION**
Top of Fuselage
**VERTICAL FIN HEIGHT**
4¼ Inches (projected)
**VERTICAL FIN WIDTH (incl. rud.)**
3⅞ Inches
**REC. ENGINE SIZE**
.049 Glow, 05 Electric
**FUEL TANK SIZE**
NA
**LANDING GEAR**
Conventional
**REC. NO. OF CHANNELS**
2
**CONTROL FUNCTIONS**
Rudder and Elevator

**BASIC MATERIALS USED IN CONSTRUCTION**

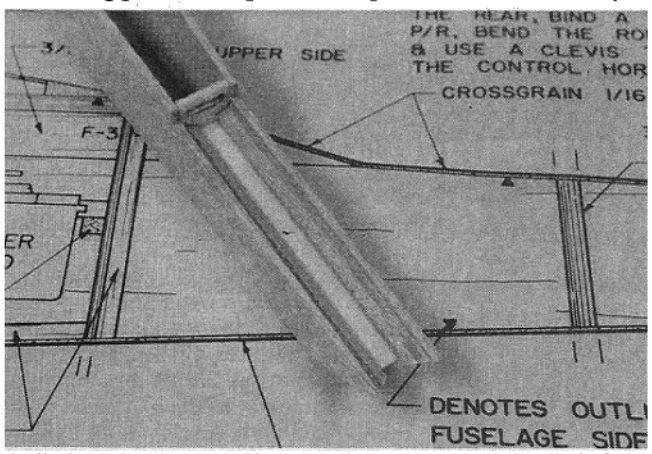
| | |
|---|---|
| Fuselage | Balsa, Spruce, Ply |
| Wing | Balsa & Spruce |
| Empennage | Balsa |
| **Wt. Ready To Fly** | **18-34 Oz.** |
| **Wing Loading** | **9.3-17.5 Oz./Sq. Ft.** |



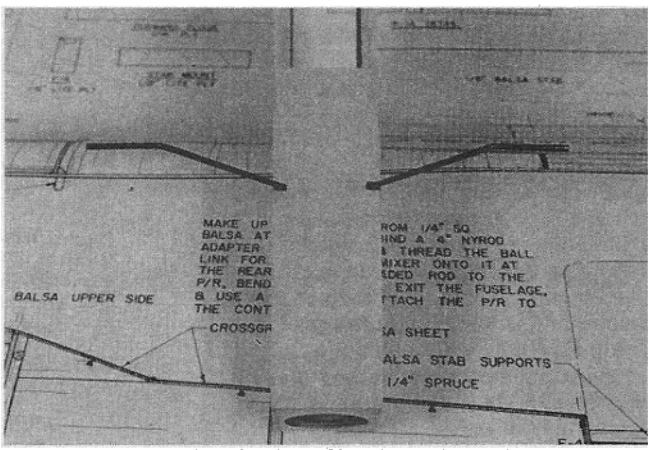

*Formers installed on right side. Position your building board so the landing gear can hang over the edge of the bench in this step.*



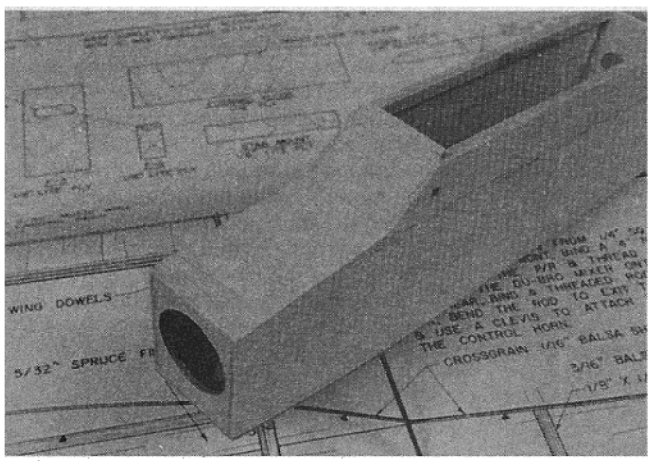

*Pull sides together over top view of plans and install F-3.*



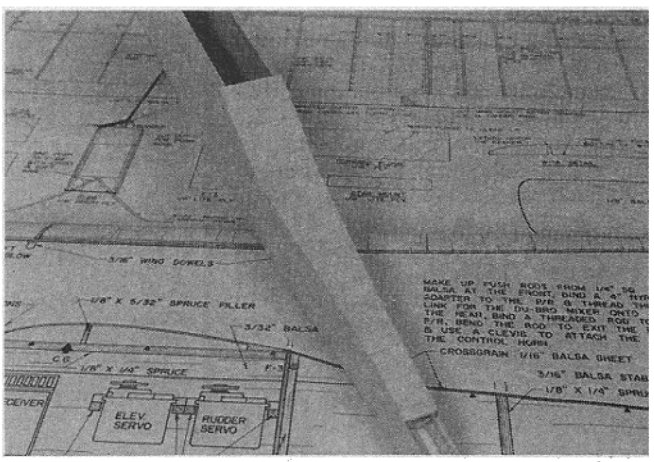

*1/8" ply stab mount and balsa stab supports are installed after F-4.*



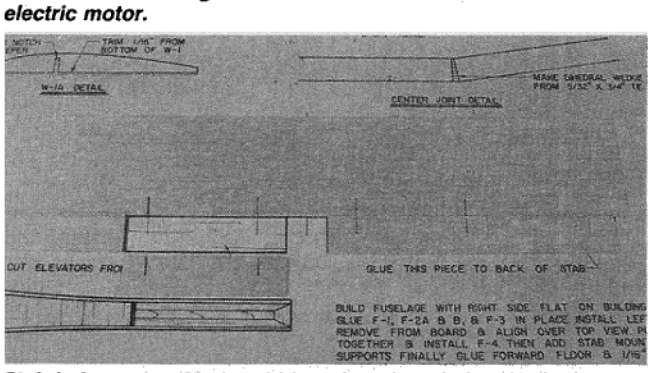

*1/16" ply forward floor in place. Note how ply has been notched for landing gear.*



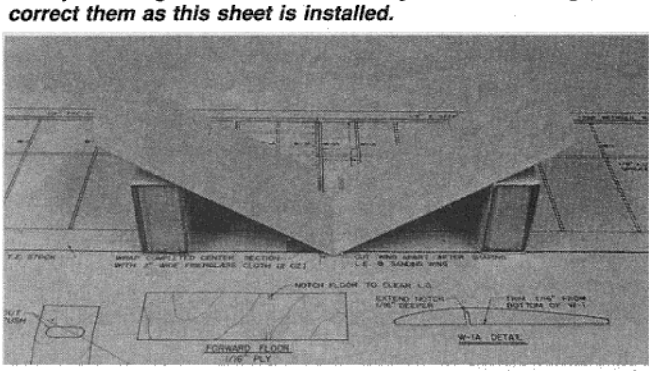

*1/16" balsa sheeting installed in nose area. Hole in F-1 is for electric motor.*



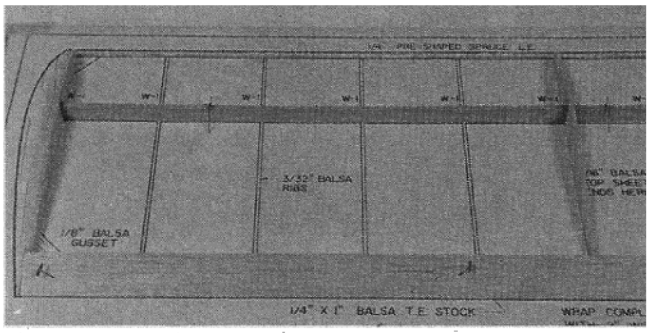

*Aft top sheeting installed. Check for any twists in fuselage and correct them as this sheet is installed.*



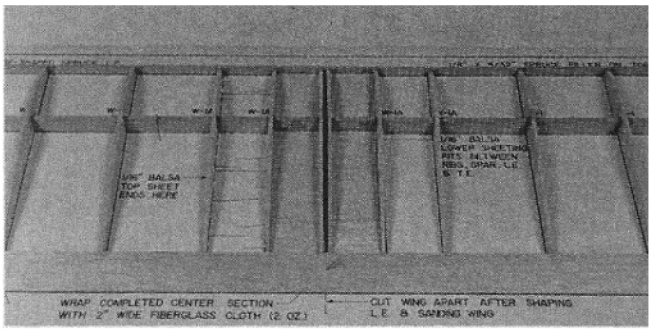

*Stab being assembled and hinge locations being marked.*



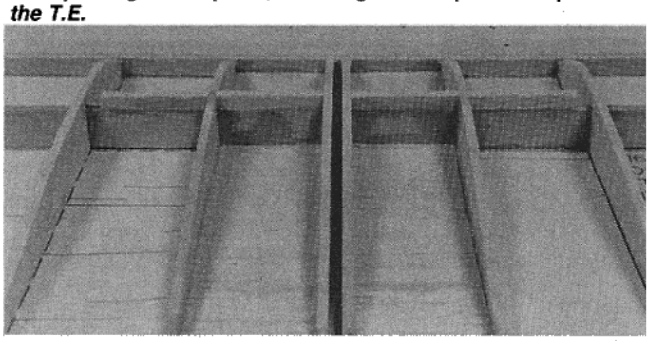

*Glue the stab together with each half blocked up off the board an equal amount.*



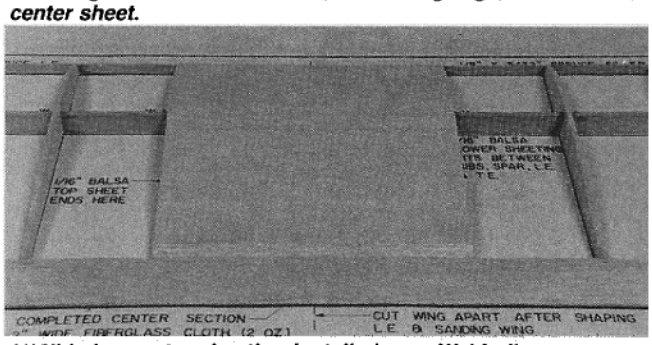

*After pinning T.E. in place, use wing ribs to space the spar from the T.E.*



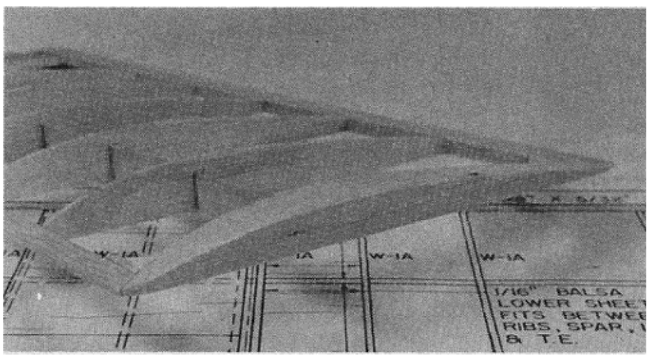

*Installing the W-1 and W-1A ribs, the leading edge, and the lower center sheet.*



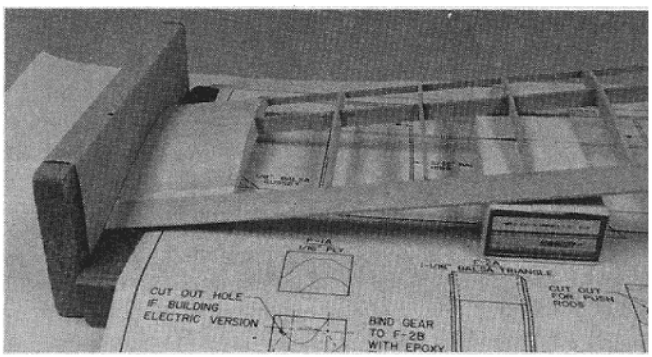
*1/8" spruce spar fillers glued in place between W-1A ribs.*



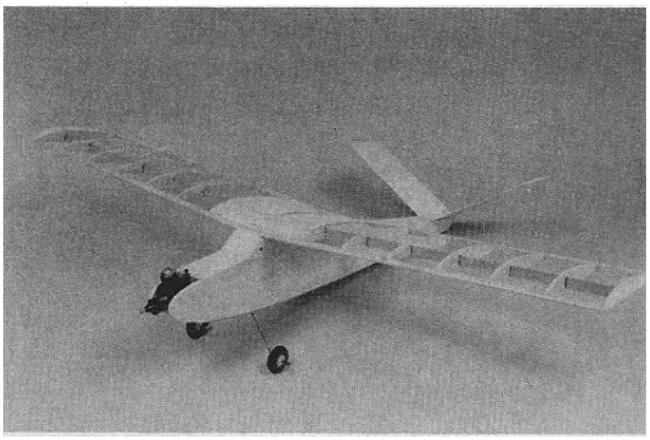

*1/16" balsa center sheeting installed over W-1A ribs.*



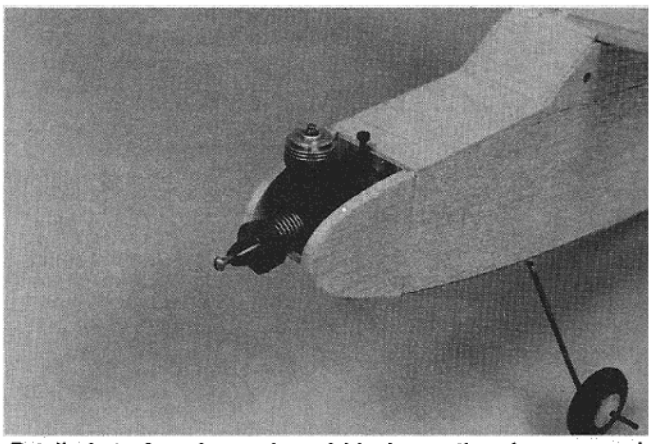

*3/4" triangle stock tip is shaped to match rib contour after installing on wing.*




*Sanding the dihedral wedge for proper angle. Note how edge of building board is used to guide sanding block.*



*Framed up glow version.*



*Detail shot of engine and cowl blocks on the glow powered Bumble-Vee.*

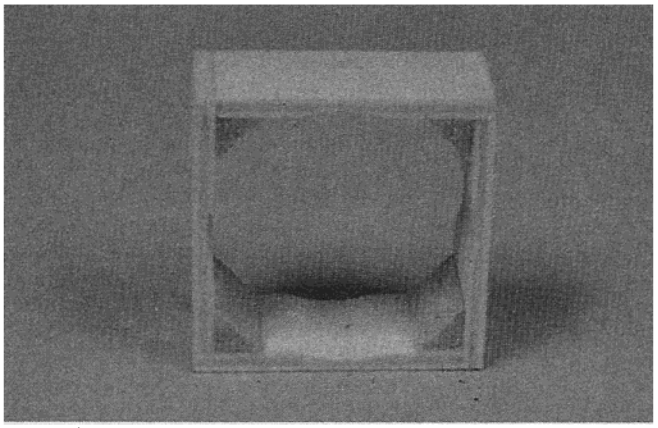
together at F-5 and install F-5. Glue the stab mount and the balsa stab supports in place. Check to be sure the fuselage isn't twisted.

Install the 1/16" sheeting on the top of the fuselage. If there is a twist in the fuselage it can be removed by twisting it the opposite way as the sheet is installed. Add the sheeting forward of the windshield block.

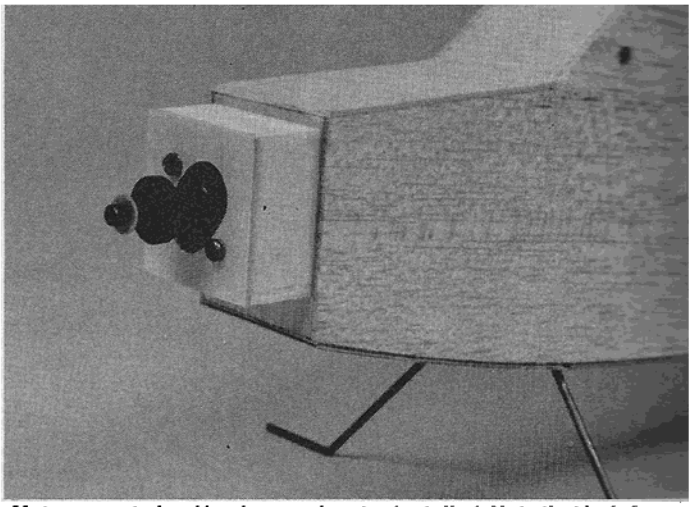
Notch the 1/16" ply forward floor to clear the landing gear and glue in place. Install the balsa bottom sheeting. On the gas version, glue the 3/16" balsa cowl pieces in place. For the electric version, build up the plywood nose extension and install it as shown on the plans, then fill around it with balsa. Sand the whole fuselage.

**Covering & Final Assembly:**

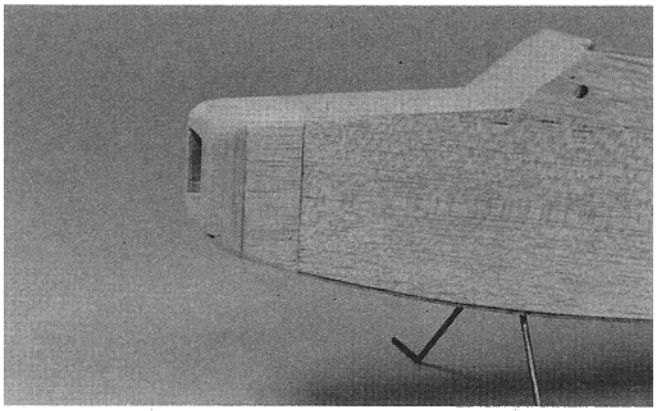
Cover the Bumble-Vee with your favorite film covering. After covering, install the wing dowels and rubber band the wing on. Pin the stab in place and check the alignment of the wing and stab. When satisfied that everything lines up, epoxy the stab in



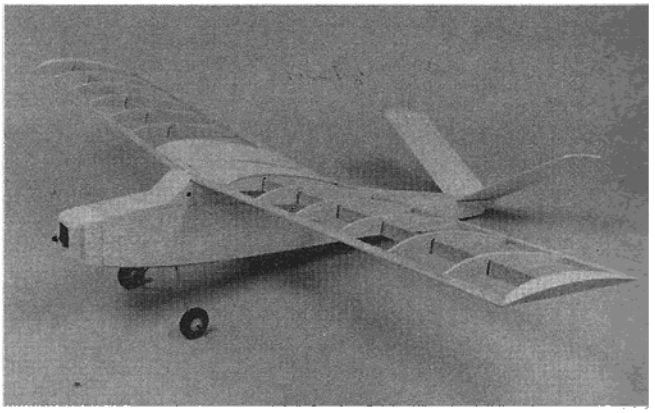
*Electric motor mount. Note that plywood has been relieved to clear 05 motor.*



*Motor mount glued in place and motor installed. Note that hole in F-1A allows cooling air to pass through motor.*



*Electric nose with 3/16" balsa fillers and balsa nose block installed.*



*Completed electric Bumble-Vee.*

position.

Mount the engine or motor in the nose. Install the radio, following the instructions included with the Du-Bro mixer for hooking up the elevons. Check the action of the controls and make sure the surfaces move in the proper direction and proper amount. Check the Center of Gravity and make sure it is where the plans show.

**Flying:**

With the control throws and C.G. shown on the plans, you should have no problems at all flying your Bumble-Vee. It is a very aerobatic two channel airplane, able to loop and roll quite easily. The electric performance is very impressive, with the Leisure 05 actually outperforming the Black Widow for the first three minutes of flight. Either electric or glow, the Bumble-Vee is a pure joy to fly and will give you hours of fun. □

**From RCModeler Oct. 1986**