MISS GRANDIN

By Ed Happich

ABOVE: Miss Grandin resting in its transport cradle. RIGHT: Mrs. Dee Ector, a flight hostess for Eastern Airlines, shows off the sleek seaplane with Lake Grandin, Interlachen, Florida, in the background.

Miss Grandin is a large 81¾" wingspan flying boat, designed for a .60 engine and which is a refined version of the original sport design first built in 1967. Five have been built to date and two are in excellent condition and are still being flown.

Lake Grandin, for which the design has been named, is a fresh water lake, comprised of 900 acres in the town of Interlachen, Florida. Living in a cottage on the East shore of the lake, where I am pleased to call home, I do all of my building and flying there.

Although this design is not recommended for the beginner, any experienced kit builder should have no difficulty with the construction methods used, especially if he has strip planked any round or oval fuselage or nacelle surfaces in other modeling endeavors. It was not conceived with acrobatics in mind, although it has performed such maneuvers as loops, wing overs, Cuban Eights, spins and consecutive horizontal rolls. The gas tank installation does not permit inverted flight. Touch and Go's, as well as full stall, full stop landings, are a joy to perform. Because of the deep "V" hull and concave forward bottom, it will land easily on the water, even in a moderate surface chop. The water rudder is completely effective in crosswinds and is retractable for beaching. The completed model, ready to fly without fuel, should weigh in at approximately 9½ pounds or less, depending on the covering and paint job used.

The cabin area at the wing rest is completely sealed watertight. The wing floats are designed to rip off on a poor landing, however, no wing structural damage will result. Simply replace (two) 1/16" plywood splints, secured with rubber bands.

If you have been curious enough to read this far, why not continue? Check the plans; the parts will fit. Build it, and you will be rewarded with many hours of relaxing fun. Furthermore, you won't be flying by yourself for long.

ABOUT THE AUTHOR

Ed Happich is the average Sunday Flyer type who has loved and enjoyed the R/C hobby since 1955 when Howard Bonner won the 1955 Nationals at Los Alamitos, California with his "Smog Hog" design. He attended that National competition and went to the hobby store in the hangar and bought a DeBolt "Live Wire Cruiser" kit, a Bonner "Varicomp" escapement, a Babcock single channel hard tube receiver and a Fox .25 engine and was on his way. Ed figures he has been buying part interest in the local hobby shops ever since.

If you want a spectacular aircraft, both on the water and in the air, try this .60 powered flying boat with an 81¾" wing span.

CONSTRUCTION

Hull Jig: In my opinion, the time spent building a jig which will insure a perfectly aligned hull, and facilitate ease of building, is not merely desirable, but a necessity. It can be built in two nights time once the materials have been purchased.

Study the full size plan of the jig. With a ruler and drafting triangle, precise positioning of frame notches and base securing blocks can be accomplished.

Hull Construction Using The Crutch Method: *For those who do not want to build the hull jig, the crutch method could be used although it has not been used on any of the prototypes.*

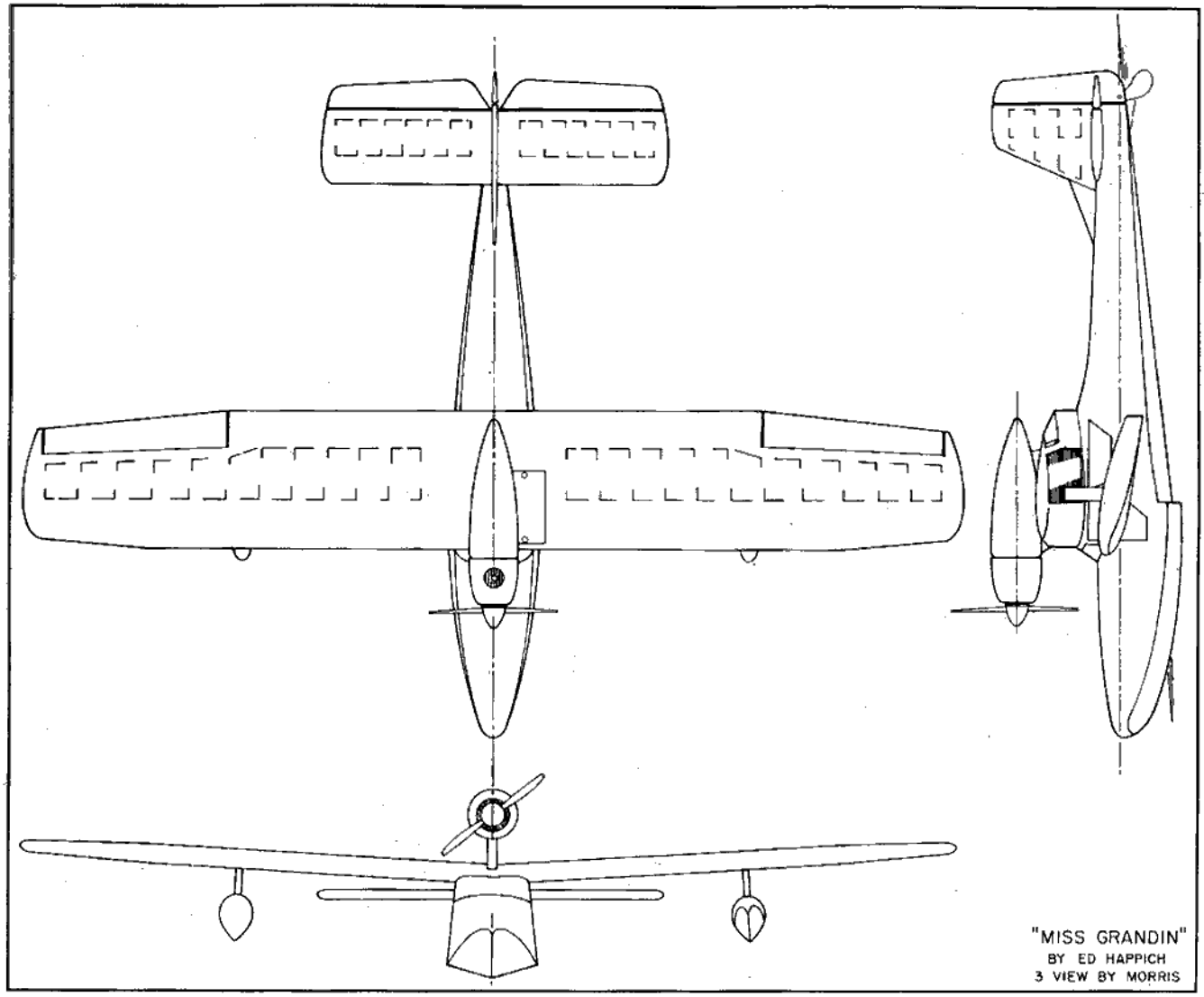
By using the hull center line shown on the side view as a reference, 3/16" x 1/2" notches can be cut in each frame at the appropriate height and two pieces of 3/16" x 1/2" balsa used as a crutch. Once the frames are glued to the crutch, the keel and bottom chines are glued in place. The wing seat doublers and top longerons are next, with the 1/8" x 1/4" balsa cross members following. This brings you up to the point of applying the hull side sheeting.

Hull Construction: All frames are constructed from 1/8" sheet balsa, except frames No. 5 and No. 7, which are sawed from 1/8" plywood and 3/32" plywood respectively. Select medium hard balsa to construct the balsa frames. It should be noted that hull frames Numbers 2, 3, and 4 must have extension pieces glued to the front sides in order to reach the base balsa securing blocks for "T" pinning. Extension pieces are cut from 1/8" balsa and are 5/8" x 4½" long. They are later cut off flush with original length of side frame, with a razor saw, when the hull is removed from the jig. Cut the forward keel from hard 3/16" sheet balsa, then (two) forward chines from 1/8" sheet balsa and, finally, the wing rest doublers from 1/4" sheet balsa.

Before locating the frames in their respective notches in the keel plate, I recommend that the top edge of the keel plate be rubbed with candle wax. This will prevent excess glue from accidentally bonding the keel to the jig. Having done this, the frames are placed in the slots. Place frame No. 1 against the front vertical surface of the vertical keel plate and, with the keel notch in the frame flush with the keel plate top surface, "T" pin in place.

Proper alignment of all frames is mandatory. This is accomplished in two steps: First, all frames are made snug in the keel plate slots by folding waxed paper as shims, and in sufficient layers, over the bottom cross numbers. 1" to 1½" wide strips will do fine. Check that all frames are plumb to base board. Proper placement of the 1/2" balsa securing blocks should insure this. Now, with a pair of dividers, check that the distance from the chine notch in each frame to the base board measures the same distance on both sides of the frame. We cannot tolerate the frame to pendulum right or left, without causing an unwanted bulge in the side at that point. As each frame is checked in this manner, "T" pin the frame to the balsa block on the base board to maintain rigid alignment. Next, bevel the tail post to the proper dimensions, cut to the exact length and pin it to the rear vertical surface of the keel plate. Apply two or three thicknesses of wax paper shims to prevent gluing to jig. At this time, install the 1/4" x 3/16" after body keel strip. Apply "T" pins through the keel into the keel plate of the jig. Add the forward and after chines, the sheer rails and the 1/4" balsa wing seat doublers. I used Titebond glue for this assembly to this point. Let dry thoroughly. This completes the basic framing construction of the hull before applying the sheeting. You have probably noticed that the framing has now gained considerable strength.

In order to arrive at a reasonably close pattern for cutting the sides which are cut from 1/8" balsa sheet, cut a piece of paper to a rectangle of 1' x 5'. Brown wrapping paper will do, however, I used drafting paper vellum. With masking tape, secure the paper to the tail post on one end and to No. 1 frame on the other. Stretch it as snug as possible. Using



finger tips, crease paper along perimeter of hull side framing. Remove paper, and trim with scissors to allow approximately 3/8" excess on all sides of creased lines. Side sheeting required is as follows: two pieces of 1/8" x 6" x 48"; two pieces of 1/8" x 2" x 36"; and two pieces of 1/8" x 4" x 10".

Lay the 1/8" x 6" x 48" sheet on a flat surface and butt glue the 1/8" x 2" x 36" to the bottom of the larger sheet 3" from the left end. Extend the larger 1/8" x 6" x 48" by adding 10" of the 1/8" x 4" x 10" piece by use of a 30 degree angle scarf splice as shown on the plans. Apply a 2" wide 1/8" doubler to reinforce the splice. Make two sides, one left and one right. Insure doublers are reversed on one side so that both doublers face inboard. Lay the paper pattern on the top of side material and trim each side carefully to the lines of the pattern.

The side sheeting may be applied to the frame more easily if the base board is "C" clamped to the workshop table top in a vertical position, thereby permitting the sheeting to be glued, clamped and pinned while in a horizontal plane. Apply glue, insure that the sheeting is tight against the framing and side edges of all frames. Let dry 30 minutes and turn base plate over to opposite side and repeat the process. After both sides are dry, excess sheeting can be trimmed and sanded in preparation for application of the bottom sheeting. Add a 3/16" x 3/16" spruce strip to the top edge of the forward balsa 3/16" keel. Start bottom strip planking with 1/16" sheet balsa, the first piece being cut to the pattern shown on the plans. Planking should start adjacent to the keel and progress outward to the chine. Use pins on each strip added at each frame. I recommend "Duco" Cement as it is fast drying and waterproof. Two ply is required to complete forward bottom. Now, the bottom hull sheeting of 3/32" x 4" x 48" balsa can be applied from step aft. When entire hull bottom has been covered, it is now ready to be removed from the jig. Double check that all "T" pins have been removed from hull frames, keel and tail post. Apply even upward pressure and, with a slight rocking motion, lift the completed hull shell from the jig.

Before proceeding with further construction of the hull, waterproof the inside bottom (bilges if you please), including an area 2" up the sides with Hobbypoxy No. 2 or fiberglass resin. This applies from the trailing edge of the wing forward.

Transporting Cradle: Constructing the cradle at this time will permit it to be used for supporting the hull, without damage, or dents during the remaining work to be done on the top of the hull. Check plans for full size templates and construction details of the cradle.

Cut formers for hood deck T1, T2, T3, T4, and T5 and also 5A. Next, set the hull in the cradle and razor saw extension pieces, glued to the side of frames of F2, F3, and F4, flush with the top of the frames. Re-cut sheer rail notches if required. Now glue the top formers of the hood deck directly on top of "F" hull frames. Former T5 glues directly to the front side of 5A. Glue 1/2" x 1/4" pieces to top of bow sheer rails and to side edges of former T1 through T5. Check cross section of frame No. 2 on plan for clarity of top deck and sheer rail construction details. Add 3/16" x 3/16" square balsa stringers. Top deck 1/8" strip planking is now added. When completed, sand and radius top decking to sides to conform to curvature of the

windshield template shown on the plans.

Using windshield front and side view templates, saw and carve the windshield blocks. Balsa grain should run horizontal. Sand with fine sandpaper and glue in place. Use filler to apply a small fillet and insure a smooth fit. I use "Dap" vinyl spackling paste.

Carving the bow blocks would be appropriate at this time. Cut the top and side view templates of the bow blocks from the plans. Laminate two blocks of balsa 2¼" x 5" x 5". The glue line should run vertical and the balsa grain fore and aft for ease of carving. Using a flat wood bit, drill a hole into the back of block, slightly top of center, 1⅛" in diameter and 1¾" deep to receive lead ballast.

Using a scrap of pine 2 x 4, a small piece 6" long will do, drill a 1⅛" hole through side of 2 x 4. Cap the hole on one side with a scrap of 1/8" plywood, by nailing with small brads. You now have a mold to pour the lead. Pour the molten lead into the hole until filled, and a slight crown appears - - - do not overfill! When cold, split wood with a chisel and epoxy lead casting into the rear of the balsa bow block.

Glue the weighted block to face of F-1. Make certain lamination glue line is centered on the center line of the bottom keel. With a ball point pen, project a line as a continuation of the chine. When carving and sanding, keep the keel stem and chine line sharp, no radius! A piece of 1¼" PVC pipe approximately 8" long wrapped with No. 80 grit sandpaper to help shape the concave bottom surface. Finish up with fine sandpaper as usual.

At this time, place hull upside down in the cradle and sand strip planked portion from step forward. Fill, if needed, with "Dap" spackling compound. Cover forward hull bottom, including bow block, with Midwest lightweight fiberglass cloth and brush resin smooth.

Tail Surfaces: Horizontal stab — Since the construction is extremely conventional, no further instructions are deemed necessary. The vertical stab is built entirely of 3/8" material and can be built on a flat surface. Do it to it!

The rudder is laminated as shown on the plans. The center 1/8" sheet grain runs horizontally and the 1/16" outside laminations run vertically. The cavity formed on the bottom permits horizontal retraction of the 1/16" plywood water rudder. All surfaces are covered with silk and doped.

Nacelle and Pylon: The plans show, in detail, the construction of the pylon and nacelle. I have used this construction successfully on all previous models and prefer not to change to a crutch and carved block method of construction.

Start construction by laminating 1/4" plywood to 1/8" plywood to obtain 3/8" thickness required for the pylon. Use 6-32 blind nuts behind the 1/4" plywood firewall to secure the "CB" alum. motor mount and drill a hole for the throttle pushrod and fuel tubing before starting assembly. Be sure to elongate the throttle pushrod hole. Construct a fuel tank next. Cut a 3/4" square tab at bottom, back wall of a 14 oz. tin can (I used a tomato sauce can), to permit tack soldering of 1/8" brass pick-up tube to bottom. This having been done, bend tab back flush and cover with a 1" x 1" doubler patch. Sweat solder in place. Solder the pick-up tube well at the front wall of the tank and solder vent. Pressure test under water and never worry about it. The tank will last years!

MISS GRANDIN
Designed By: Ed Happich

TYPE AIRCRAFT
Sport Seaplane
WINGSPAN
81¼ Inches
WING CHORD
11¾" (Avg.)
TOTAL WING AREA
978 Square Inches
WING LOCATION
High Wing
AIRFOIL
Semi-Symmetrical (2415)
WING PLANFORM
Constant Chord - Double Tapered Tips
DIHEDRAL, EACH TIP
2" At 36" Station
O.A. HULL LENGTH
56¾ Inches
RADIO COMPARTMENT AREA
(L) 9½" X (W) 2½" X (H) 2½"
STABILIZER SPAN
31⅞ Inches
STABILIZER CHORD (incl. elev.)
8¾" (Avg.)
STABILIZER AREA
207 Square Inches (Approx.)
STAB AIRFOIL SECTION
Symmetrical
STABILIZER LOCATION
Top of Hull
VERTICAL FIN HEIGHT
9 Inches
VERTICAL FIN WIDTH (incl. rudder)
10¼ Inches
REC. ENGINE SIZE
.60-.61 cu. in.
FUEL TANK SIZE
16 Ounce
LANDING GEAR
N/A
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rud., Elev., Throt., Ail.
BASIC MATERIALS USED IN CONSTRUCTION

Hull	Balsa & Ply
Wing	Balsa & Ply
Empennage	Balsa
Weight Ready-To-Fly	148-156oz.
Wing Loading	21.9-23 oz./sq. ft.

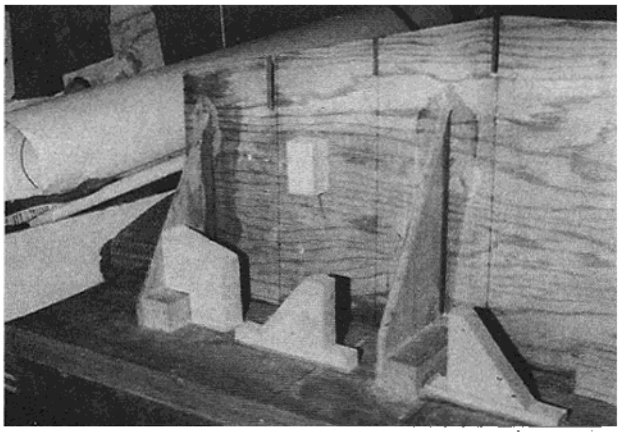
Before starting assembly of the nacelle, install the throttle torsion rod, horn and bearing assembly now. I used a Midwest steel elevator control horn 6" wide and cut the long horn exactly in half, using the cut off piece for the horn on the right throttle side, soft soldering in place. Horns are soldered 90 degrees apart. Cut torsion rod to proper length. The original horn which is factory silver soldered, is connected to the clevis and cable going to the throttle servo. Epoxy 3/16" ply bearing blocks to rear side of firewall as shown; control end play with 3/32" wheel collars. The distance from the center line of the torsion rod to the hole used in the horn for clevis attachment should be 1/2" both horns. Radius ends of sawed off horns before installing on firewall.

Epoxy firewall to 3/8 ply pylon, insuring angle is 90 degrees. Before adding gas tank and formers, complete throttle installation.

Solder Du-Bro clevis to Du-Bro flexible throttle cable. Be sure it's a good job, as you cannot get to it later! Attach clevis and cable horn on left side of pylon as per plans. The horn should be within 1/16" from side of pylon. Insert nylon housing and sew to pylon with nylon thread. Drill through pylon with No. 52 drill for this purpose. Mark two parallel lines 3/16" apart to indicate on the pylon the exact location where all nacelle frames are to be glued. Next, epoxy gas tank in place. Use scraps of wood cut as wedges to hold securely in pylon. Make certain the vent line is pointing straight up and that the fuel suction line is centered in hole previously cut in firewall. The remainder of the pylon is constructed using "Duco" cement. Add frames N-1 through N-7 at this time. When dry, clamp bottom end of pylon into table vise and, with a narrow sand block, lightly sand frames to proper bevel. Commence strip planking. I started the first strip at top center and worked around to the pylon in each direction. Add tail cone block to nacelle and carve to shape. When completed, sand, fill, and apply several coats of Aero-Gloss sealer and set aside to dry.

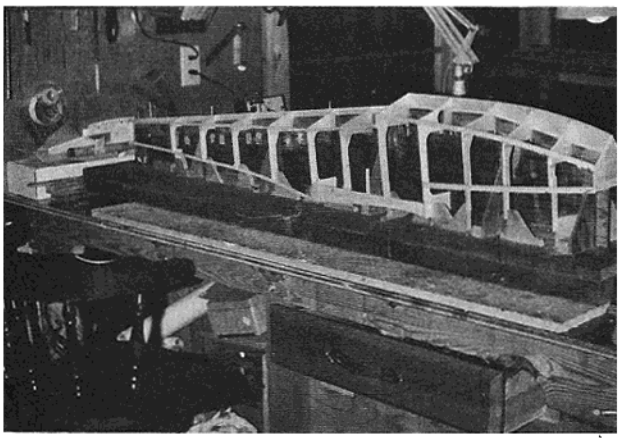
Wing Floats: Cut template of side view and top view from the plans. Using the side view template, cut to shape the two center 3/8" sheet pieces first. Cut out lightening holes as shown. Cut to shape four 1" thick blocks and, finally, four pieces of 1/4" x 3" x 9" doubler blocks. Permanently glue the 1/4" x 3" x 9" doubler blocks to the 1" blocks. Temporarily tack glue the 1" blocks to the center 3/8" piece. Easy on the glue, as the 1" blocks must be separated later. Once the glue is dry, use top view template and transfer outline and band saw to shape. Carve both blocks to identical symmetry and, using a 3/4" x 8" piece of PVC wrapped with No. 80 grit sandpaper, will be very helpful in shaping the concave "V" bow.

When shaping and sanding is completed, cut apart and hollow as shown on plans. If you are fortunate enough to own a Dremel Moto-Tool, use a ball burr and the job is made easy, but oh! what a mess on the floor. Use care

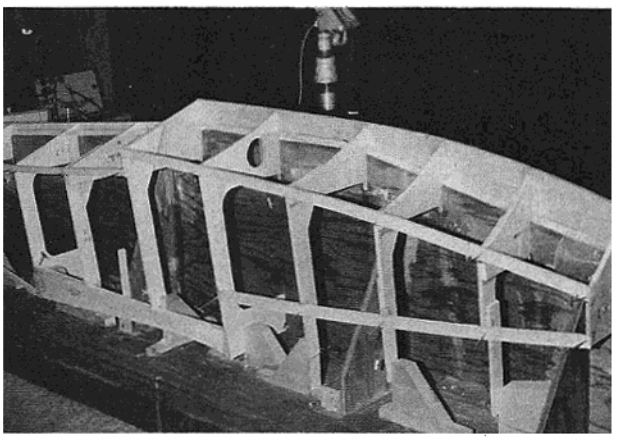


Close up of hull jig showing blocks to secure hull frames.

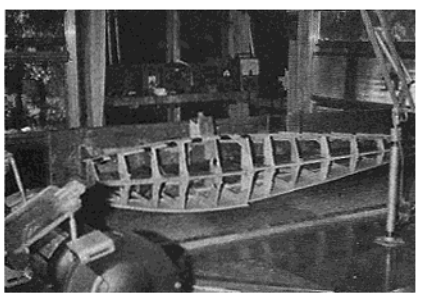
Author's hull jig on work bench. To date, five hulls have been built on this jig.



Basic frame work of hull has been completed at this point.



Note temporary extensions of bow frames to reach base board (see text).



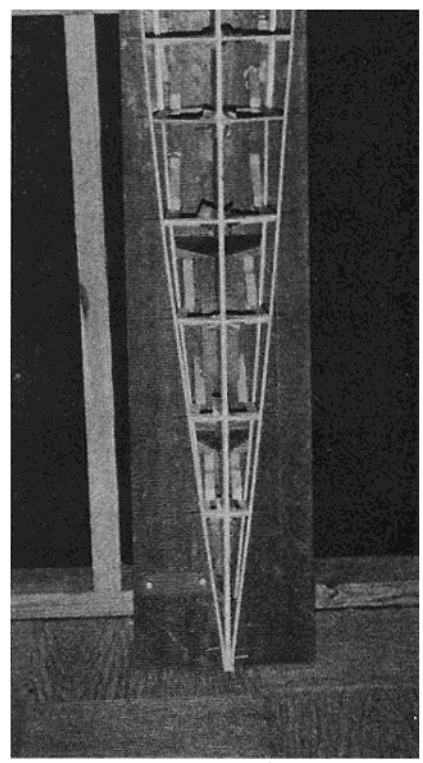
Base of hull jig is "C" clamped in vertical position for ease of installing side sheeting.

around the foward keel and concave areas. When completed, re-glue the outside sections to the center piece and install 3/8" x 1" bass wood float strut. Every time you walk past these beauties in the shop admire them, and brush on another coat of dope!

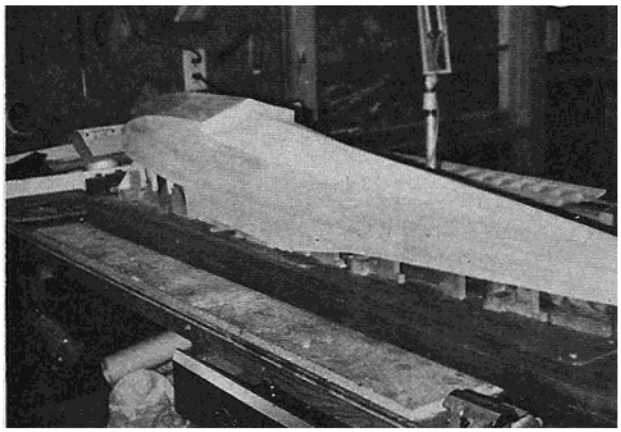
Wing Construction: Cut out all of the ribs from medium 3/32" sheet. Score halfway through all aileron ribs where shown by the dotted line on the plans. Later, when the wing is completed and the aileron is removed from the wing, this scored line is cut completely through, and the front 1/8" aileron cap piece is glued in place. All ribs shown on the plans have two holes 2⅛" apart. These 1/4" holes fit steel rods which I use on an A-justo-jig. **Note:** If builder does not have a wing jig, the wing can be built as a straight chord wing which can be more easily built on a flat board. Also, 3" of wing can be omitted on each side, making a total span of 3' each panel, plus wing tips. This will result in a slightly higher wing loading, however, this will present no problem. In this case, make sure wing float position remains the same distance out from the centerline of the wing.

Before starting actual construction of the wing, cut out all ribs and set the wing dihedral angle for 2" at 36" out from the centerline. Place the two center ribs of 3/16" sheet 3/8" apart plus two shims of ordinary tablet writing paper. Using a piece of 3/8" x 3" x 3" sheet balsa as a spacer, plus the paper shims, place between the center ribs and insure the dihedral angle is bisected equally at each wing panel. Use care as the pylon and engine nacelle is later glued between these center ribs.

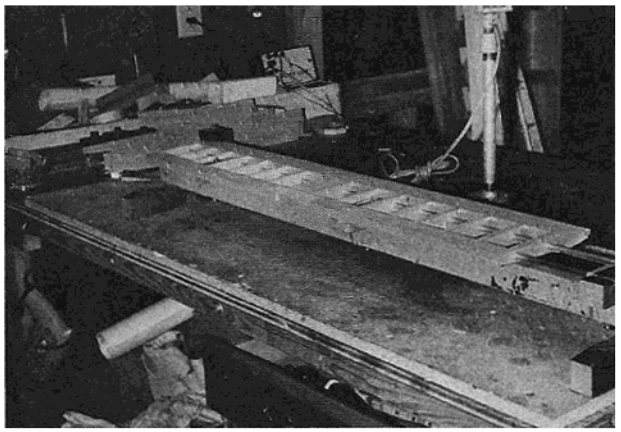
Place ribs on jig as shown on plans. Add front and rear, top and bottom spar. Saw eight 1/8" ply dihedral braces, glue and clamp in place. Rip or sand to shape the 3/16" leading edge capstrip and glue in place. Remove 1/8" from front edge of 3/16" center ribs and install 1/8" ply L.E. doubler to back edge of 3/16" L.E.



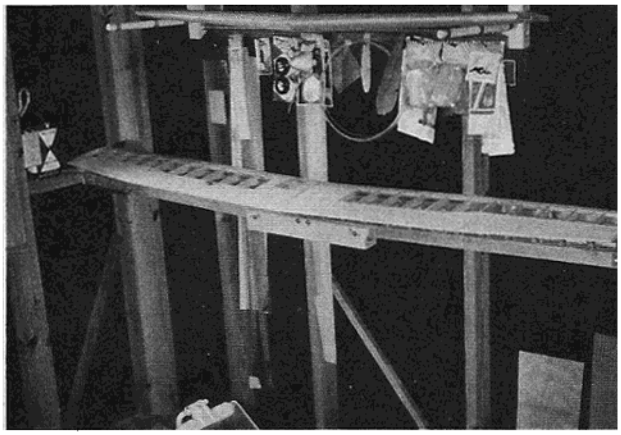
Jig set aside on floor while frame work is drying.



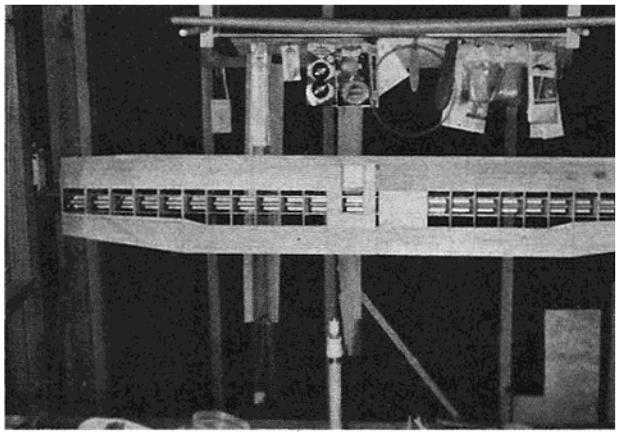
Side and bottom sheeting complete. Set aside over night to dry prior to applying fiberglass cloth and resin.



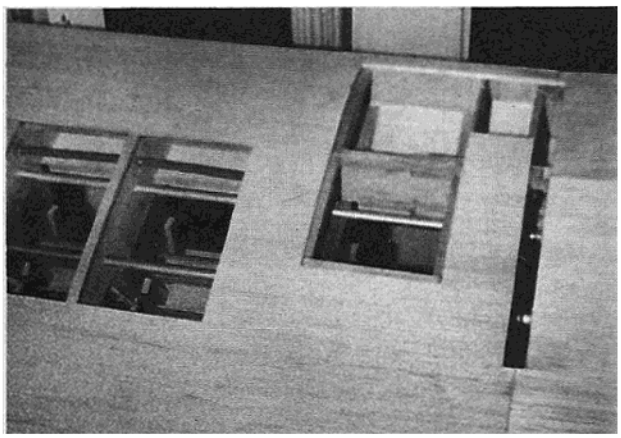
Stab framed & sheeted on top only. Ready to turn over and complete bottom side.



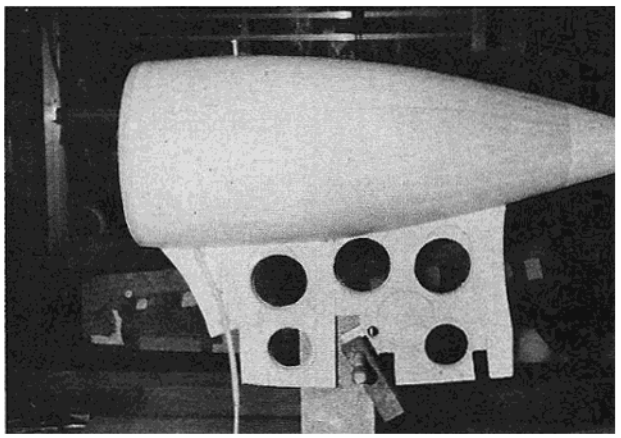
Near completed wing in jig. Ailerons ready to be cut loose with razor saw.



Planform of wing in jig. Wing can be shaped and sanded while still in jig.



Shows servo compartment and slot for engine pylon.



View of nacelle and pylon after strip planking. Not difficult but takes time.

capstrip.

The wing 3/32" sheeting can now be applied. Start out with the bottom trailing edge sheeting. The entire trailing edge is cut from 4" wide and 48" length 3/32" sheet. Glue bottom T.E. sheet without cutting aileron taper allowing edge of sheet to extend 1/8" beyond tip of rib as shown on plans. Glue and pin in place. When dry, using a straightedge, cut taper in aileron and again allow 1/8" beyond tip of rib. Now top T.E. sheeting can be applied. When dry, cut aileron taper as before.

Pylon and nacelle can be cemented to wing at this time. Check dry fit. Make sure pylon can be pushed through center ribs flush with the bottom. You will have to cut 1/8" slot in rib to permit throttle cable to align with torque arm of servo. When okay, glue permanently in place, using epoxy.

Leading edge sheeting can be cut from 4" x 36" length sheet, as it is applied in two pieces. There is a butt joint where the L.E. taper begins. Pre-cut and check before gluing. Go to it! Only seven more pieces to go and L.E. sheeting is complete.

All center section 3/32" sheeting, top and bottom can be applied now, as well as the top rib capstrips. Sand L.E. capstrip with a sand block to prepare for gluing 3/8" x 1" L.E. into position. A butt splice is made at point where taper

begins. Since the taper portion of the wing is thinner, the excess L.E. material must be removed with razor plane, and sand to shape with sand block. Sand entire wing lightly with 400A sandpaper. This is the appropriate time to cut the ailerons free from the wing while it is still held secure in the jig. Once removed from wing, complete aileron 100% at this time to prevent chances of warping. Cap each end of the aileron with 1/8" sheet, after adding 3/16" sheet hinge support doubler blocks as well as 1/8" ply aileron horn support. Remove the wing from the jig. It's a long "son of a gun", so watch out for hangar crashes!

Add 3/32" ply float strut supporting plates. Glue reinforcing triangular gusset material and install float strut. Insure 45 degree angle on float strut; cut as shown. Also provide a generous horizontal slot, 1/8" x 1/4", at the precise location for the aileron bellcrank push wire before gluing float strut in place. Apply 3/32" sheeting around float strut as per plan.

The aileron bellcrank 3/32" ply platform can be installed now, as well as the bellcrank and the push wire from servo and clevis rod to aileron horn. Apply 3/32" balsa sheet around exit of rod to aileron horn; add tip blocks and wing structure is complete.

Completion of Hull: Install 1/8" balsa stab seat doubler to inside of hull on both sides. Glue top frame 1/8" x 1/4" top horizontal cross members to each frame station. Glue 1/8" x 1" ply cross supports for elevator and rudder Gold'N-Rod push tube housings. Cut slots for exits of push tube housings, and epoxy push tube housings in place.

Make a template of the horizontal stabilizer seat and cut out top edge of hull sides to a zero degrees incidence fit. Sand as necessary for good fit. Hold stab in place and check for tilt. If okay, glue with epoxy and nail with several straight pins. Add 1/16" plywood doublers for rear wing dowels. Close in top of hull by gluing 1/8" balsa sheeting, with grain running crossways, from the trailing edge of the wing to the leading edge of the horizontal stabilizer. Align and glue the vertical stabilizer with the dorsal fin in place.

This step is optional: On all of my seaplanes, I cut strips of full scale aircraft fabric reinforcing tape cut 1" wide with pinking shears, to the appropriate length and glue this with Duco cement into the 90 degree areas formed by the vertical stab and the top of the horizontal stab; also the bottom of the horizontal stab to the side of the hull. Taper to a point at both ends. This gives tremendous strength to the tail structure and prevents dope from bridging.

In the cabin area, use 1/4" sheet balsa for framing seat which receives 1/16" plywood watertight hatch cover. Note side pieces have slight curvature. Fabricate hatch cover from 1/16" ply, sand to close fit around perimeter. Glue 3/32" x 3/8" balsa stiffeners as shown. With hatch cover in position, drill 12 holes with 7/64" drill through hatch cover and 1/4" balsa seat. Remove cover and install 3-48 blind nuts with epoxy to bottom of hatch cover seat.

Make the servo, battery and receiver equipment board of 3/32" plywood. The board is 3" wide with a 2" tongue cut 3/4" back from the front edge. Epoxy a piece of maple motor mount stock 3/8" x 1/2" x 1½" to back side of plywood frame F-5 after installing a 6-32 blind nut to bottom of block, as shown on the plans. This anchors rear end of equipment board. Mount trapezoid shaped 1/4" x 3/8" servo rails. Install piano wire hooks as shown to secure battery pack and receiver.

In order to permit easy installation and removal of the equipment board, piano wire pushrods can be disconnected at the idler arm in the cabin and left attached to the servo. Plans show details of idler arms. Horizontal spacing between idler arms is maintained by cutting proper length spacers from 3/16" red Gold'N-Rod cable housing and slipping them over 1/8" piano wire axle for idler arms. Idler arm maple bearing blocks are then epoxied to the side frames of 6B then bolted with 2-56 screws. Make sure the holes for the 2-56 screws are drilled before gluing in place. Install switch harness and extension plugs for wing servos. Final alignment check: Before applying covering, now is the time to make that all important decallage check. Set hull in cradle. Strap on wing with several rubber bands. Slide hull forward or aft to set horizontal stabilizer at zero degrees incidence as referenced from a level table top. Once you have the same ruler measurement from the table top to the center of the stab leading and trailing edge, do not disturb the hull as you check the wing incidence for zero degrees also. Checking the wing in the same manner as the stab, if you obtain the same measurement from the table top to the center of both L.E. and T.E., your decallage is zero degrees and no changes need to be made. Anything else is unacceptable and must be corrected by trimming the hull wing saddle until the wing incidence does check zero degrees. Engine thrust is zero degrees down and 1 degree right.

Finishing: The original model was covered with silk and given a twelve coat Aero-Gloss paint job. Finishing is a matter of personal preference and the choice is left up to you.

Flying: First off — make sure that all important radio gear is working properly. Be sure of your batteries and have a fresh charge. Check all controls, both with engine off and engine running at all speeds. Vibration can cause erratic servo operation.

Spend a little extra time to make sure that engine idling is reliable. Check throttle response for smooth acceleration. Now the past verbage is old information to most of you and should hardly be necessary to repeat. However, don't assume anything after the hours of burning lights and labor of love you have endured on a project such as this.

The time is at hand, crank your engine, turn on the radio switch and set the bird in the water. Taxi around for a minute or so, you will notice the water rudder is very effective. Hold full up elevator while taxiing and it is desirable to take advantage of ailerons also when making 180 degree turns to a down wind heading if there is any appreciable wind. That is, lower the aileron on the side you wish to turn. The drag of the fully lowered aileron will create drag and assist the plane to turn.

Let the plane seek the wind line. A seaplane is like a wind vane, it always weathercocks into the wind. If the take-off course is clear, hold full up elevator and open the throttle smoothly. Hold a slight amount of right rudder pressure until the plane climbs up onto the step. "Miss Grandin" will plane and leave the water gracefully as the Grumman "Albatross". Enjoy! □

From RCModeler July 1978