SNOOPY

Really Lives In Royal Oak, Michigan. Just Ask Otto Heithecker...

My modeling experience goes back to the mid 1940's when I was actively building and flying all types of indoor and outdoor model planes.

I started flying R/C gliders in early 1971 after my wife gave me a Cirrus for Christmas. I built it and had it in the air by the first part of April. After many flights and a couple of contests I decided to design my own sailplane using my free flight experience as a guide.

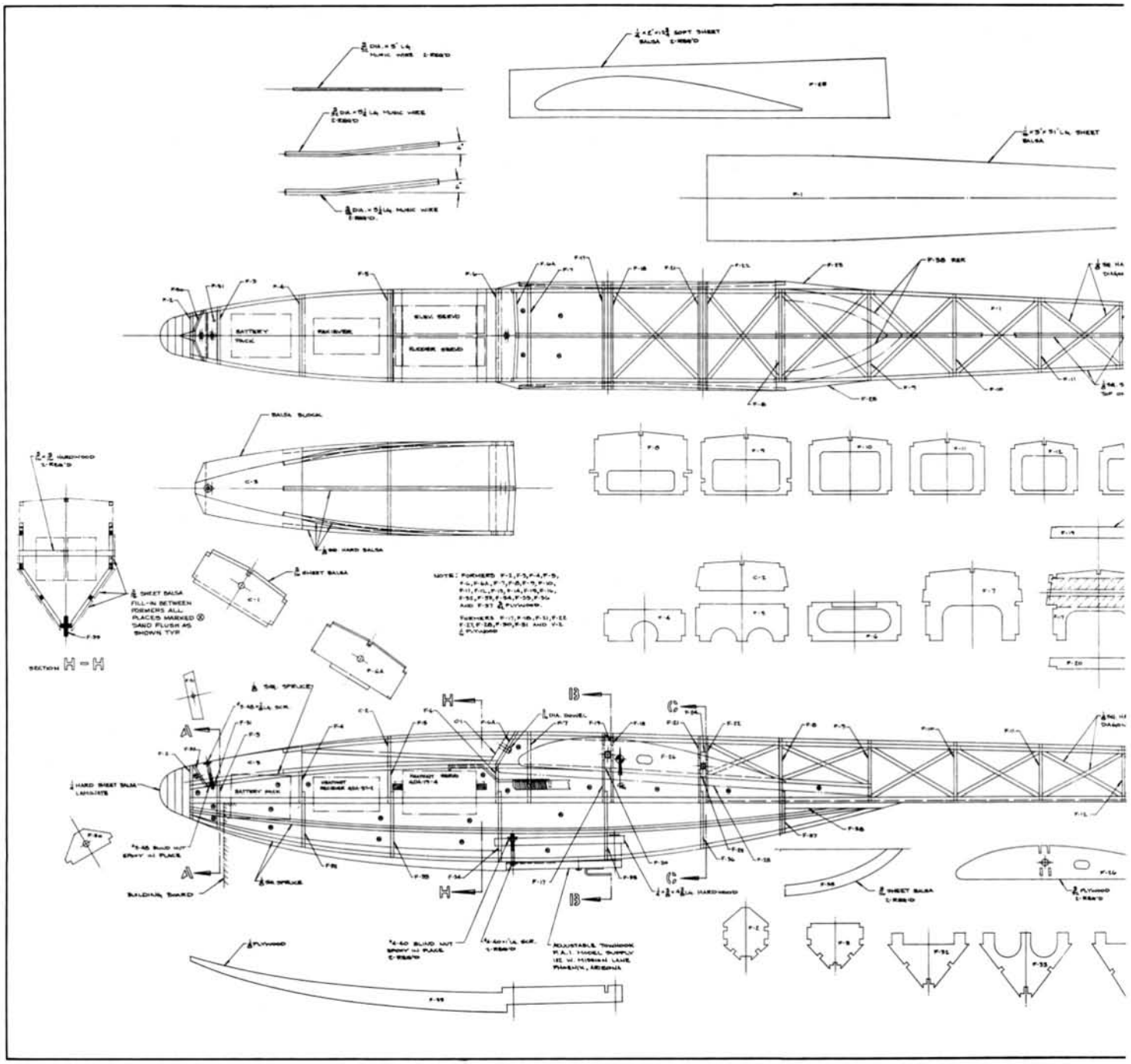
Snoopy was born out of a desire to have a sailplane that would be stable (hands off flying), with a light wing loading (8 oz. per sq. ft. max.) and capable of good dead air time. This combination, I believed, was necessary in order to be competitive in contests. This has since proven to be the right approach, at least for me.

The light wing loading allows me to work marginal lift to the best advantage for those precious extra seconds, and even minutes, when needed.

Snoopy is a high performance sailplane designed for duration and precision events. It will accomodate almost any two channel R/C gear on the market today. The wing span is 125" with a total of 906 sq. inches of area. Plug-in wing panels and removeable elevator provide convenient packing for traveling to and from the flying site. The normal glide speed is slow, although by adding down trim, it will speed up and penetrate quite well to get you back to the flying field.

The Cirrus airfoil was chosen for its stability and high lift characteristics. The wing is of typical "D" tube construction, similar to the Cirrus, except for the sheet balsa trailing edge and cap strips which increase structural integrity. A built-up fuselage was used to keep the rear portion of the fuselage as light as possible, thereby reducing the necessity for nose ballast. You obtain instant response to elevator control when needed.

Select your wood carefully using lightweight stock unless otherwise noted on the plans. I suggest you use Titebond glue throughout unless otherwise specified. Follow the construction sequence and you will not



have any problems. This is absolutely necessary when constructing the fuselage.

Now let's begin actual construction.

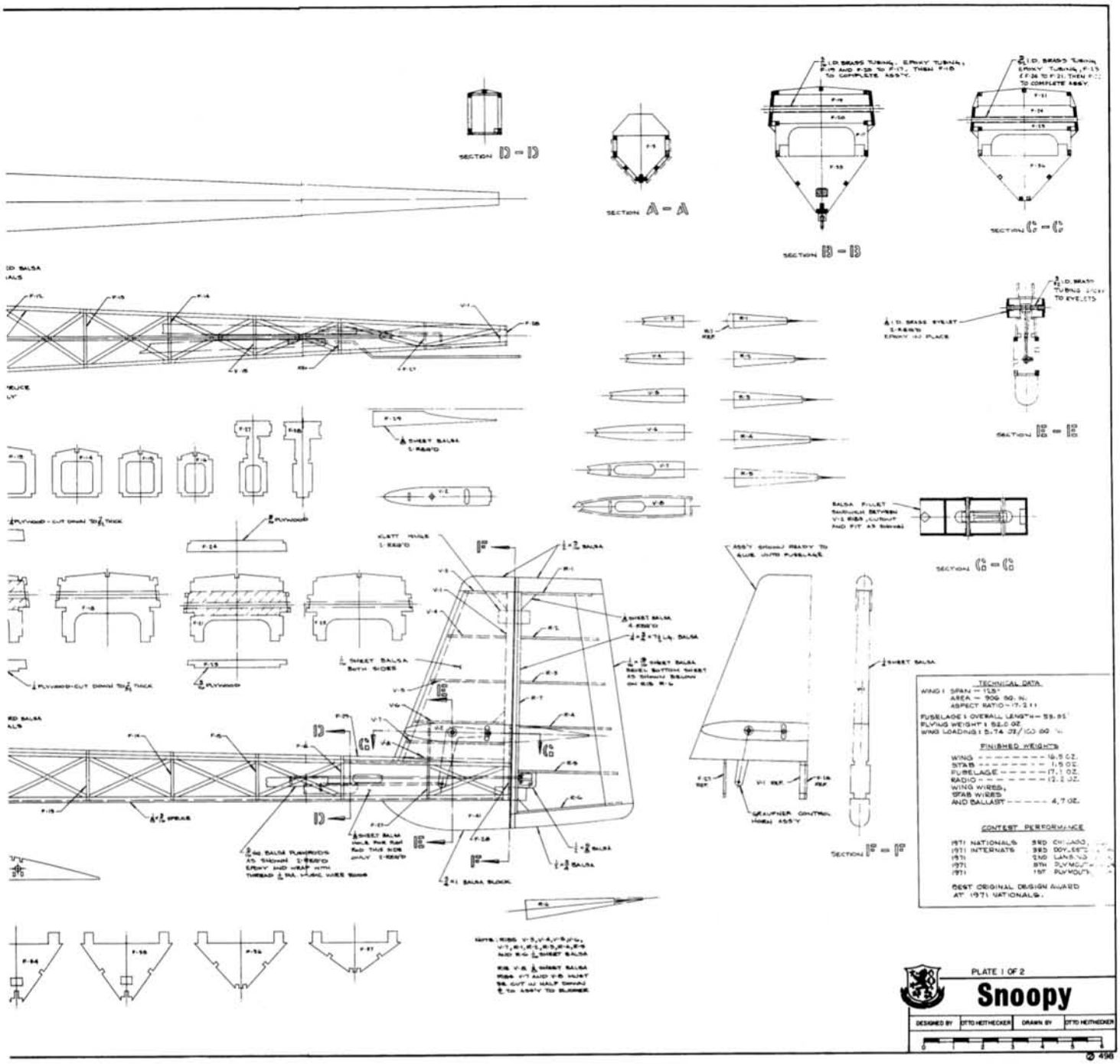
WING:

Splice together all 1/16" sheet balsa, 1/8" x 3/16" spruce spars, 1/8" x 1/2" balsa false leading edge and 1/4" x 1/2" balsa leading edge, as shown on the plans. Make the rib templates out of 1/32" aluminum or suitable material. Cut (33) balsa rectangles 1-¼" x 8-3/4" from 1/16" sheet and sandwich between aluminum templates. Use small screws long enough to go through the stack and retain with a nut to hold the stack together. Rough carve to outline, then finish by sanding to the templates. Cut the notches for the spars with a small file. Make (1) set of ribs per half panel.

Using balsa rib #W-1 as a template, cut (2) ribs out of 1/8" plywood.

Using balsa rib # W-2, W-3, and W-4 as templates, cut (2) ribs each out of 1/16" plywood. Cut (2) ribs # F-26 out of 3/32" plywood for the fuselage at this time. Stack all the plywood ribs accurately, lining up the front spar and the lower edge of the ribs. Rib # F-26 lower edge must be 1/16" below all the other ribs to allow for the sheeting on the wing ribs. Clamp together and drill a 7/32" dia. hole through all ribs for the front wing tubing. Drill 3/16" dia. hole through all ribs for the rear wing tubing (this will assure you of exact alignment between the wing and fuselage).

Start construction by laying down wax paper over the plans and proceed as follows: Pin down the lower 1/16" sheet balsa and center 1/16" sheet balsa. Glue the lower spruce spar to the sheeting and, while drying, pin down the lower 1/16" sheet balsa trailing edge. Glue in the lower cap strips and lower angular 1/8" x 3/16" spruce spar along with the 1/8" square spruce spar. Ribs No. W-1 through W-8 must be notched out for the angular spar and 1/8" square spar at this point. Glue in ribs W-1 through W-33 and



allow to dry.

Unpin the wing tip and add the washout jig at trailing edge, then repin to hold the washout. Now glue in the top 1/8" x 3/16" spruce spar and top 1/8" x 3/16" angular spruce spar. Glue the 1/8" x 1/2" balsa false leading edge in place. Epoxy in the brass wing tubes (7/32 O.D. front and 3/16 O.D. rear) as shown. Epoxy 3/16" hard balsa fill-in over and under the front wing tubing as shown. Epoxy 1/4" square hard balsa and 1/8" x 3/16" spruce fill-in over and under the rear wing tubing as shown; epoxy the 1/16" plywood front and rear webbing in the first four spaces only.

Use Titebond glue for the remaining plywood and 1/16" sheet balsa webbing (vertical grain and hard balsa) as shown. Add 1/8" hard balsa fill-in at the trailing edge, and the 1/8" hard balsa diagonal brace at the leading edge at rib W-1. Add the 1/4" x 1/2" x 1/2" hardwood as shown for the wing retaining hook.

Trim the balsa false leading edge using a razor blade plane, followed by sanding to final shape. Next, glue on the upper 1/16" balsa sheeting and 1/16" sheet trailing edge (bevel edge as shown on plans) and add the 1/16" x 3/16" balsa cap strips and center 1/16" sheeting.

Remove from the board when dry and trim the front sheeting flush with the false leading edge. Glue on the 1/4" x 1/2" leading edge, add the wing tip block, then carve and sand to the contour shown. Sand the entire wing lightly and cover with Super MonoKote or Solarfilm using your favorite colors.

STABILIZER:

Make the rib templates out of 1/32" aluminum or other suitable material. Cut (10) balsa rectangles 3/4" x 6" from 1/16" sheet and sandwich them between the aluminum templates. Use small screws long . . . .

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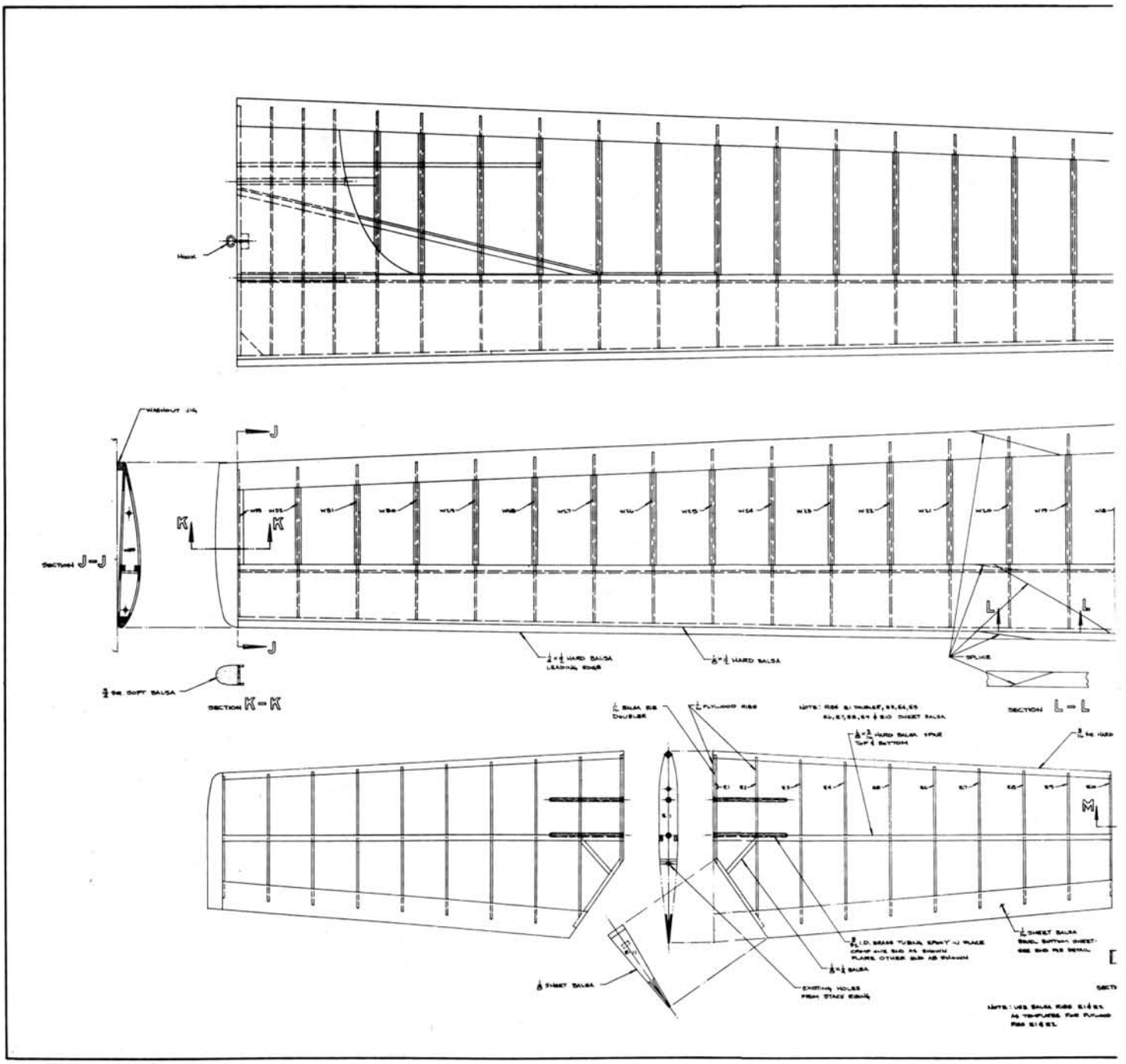


enough to go through the stack and retain with a nut to hold the stack together. Rough carve to outline, then finish by sanding to match the templates. Cut the notches for the leading edge, spars, and trailing edge with a small file. Make (1) set of ribs per half panel.

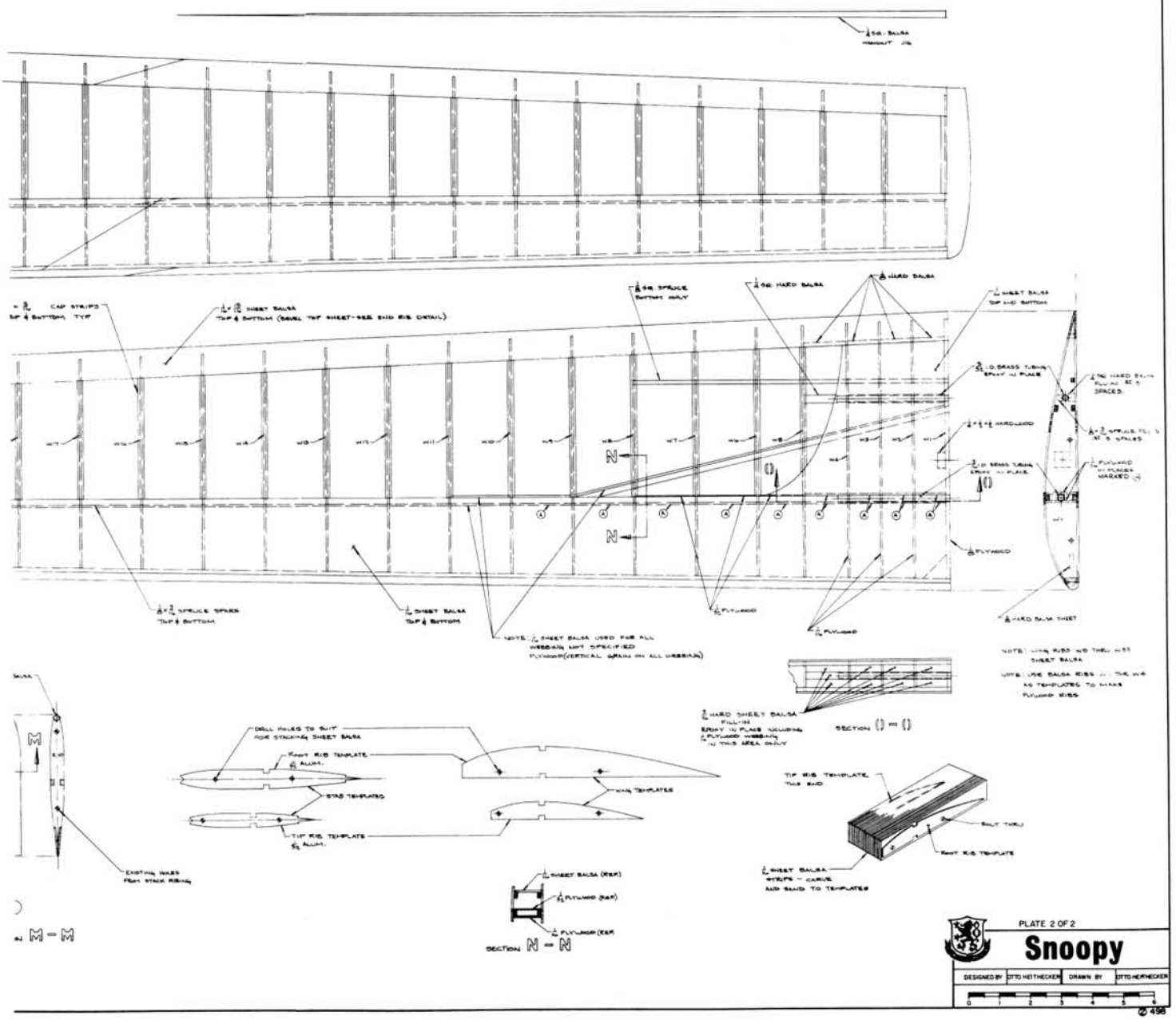
Using balsa ribs E-1 and E-2 as templates, cut (2) ribs each out of 1/16" plywood. Glue balsa ribs E-1 to each plywood rib E-1 as doubler. Drill 1/8" diameter holes for the brass tubing at this time, taking care to drill to the exact center distance, using a Cirrus control horn for a gauge.

Pin down the lower 1/8" x 3/16" balsa spar. Cut ribs E-1 and E-2 to the lengths shown on the plans. Glue in Ribs E-1 through E-10 followed by the 1/8" x 3/16" top balsa spar. Glue on the 3/16" sq. balsa leading edge and the 1/16" sheet top trailing edge. Next, add E-11 along with the diagonal 1/8" x 1/4" balsa brace. Epoxy the brass tubes in place as shown. When dry, remove from the building board and add the lower 1/16" sheet balsa trailing edge (bevel as shown). When dry, shape the leading edge, and glue on the stab tips. Rough carve the tip blocks and sand to shape. Lightly sand the entire stab and cover with Super MonoKote or Solarfilm.

The fuselage will be constructed after the vertical fin and pushrods are completed.

VERTICAL TAIL:

Cut out the 1/16" balsa ribs, V-3 through V-7, and the 1/8" balsa rib V-8. The rear spar V-1 is made from ¼" balsa, while formers F-27 and F-28 are from 1/16" plywood. Cut out (2) false ribs, V-2, from 1/16" plywood and glue them on each end of a 5/8" x 1-1/8" x 3¾" piece of balsa. Shape this to the V-2 ribs and cut out as shown for the control horn, leading edge, and trailing edge (see section E-E and G-G). Epoxy eyelets on either end as shown. Drill the front hole in the control horn out to 1/8" diameter to



accept the brass tubing and drill out the rear hole to 3/32" diameter for the rear stabilizer wire. Add the 1/8" O.D. brass tubing while holding the control horn in place and epoxy the tube into the eyelets. Glue onto spar V-1 ribs V-8, V-7, control horn assembly V-6, V-5, V-4 and V-3. Add the 1/8" sheet balsa brace and the ¼" sq. balsa leading edge. Glue the 1/16" sheet balsa on both sides and then the balsa tip. Sand to shape and cover with Super MonoKote or Solarfilm.

If you use solid pushrods, these should be made up now, as detailed on the plans.

RUDDER:

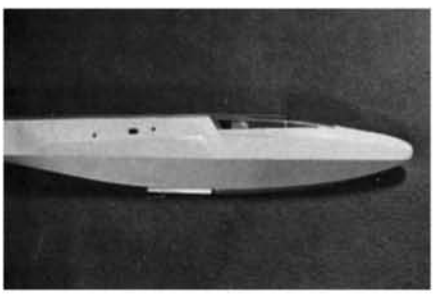
Cut out ribs R-1 through R-6 from 1/16" sheet balsa and fabricate the trailing edges from 1/16" x 15/16" sheet balsa. Cut out R-7 from ¼" sheet balsa. Pin R-7 and the bottom 1/16" sheet balsa trailing edge to the building board. Glue in ribs R-1 through R-6, the 1/8" sheet balsa corner braces and 1/2" x 5/8" balsa for the control horn. Glue on the top 1/16" sheet trailing edge. Remove when dry, and glue on the balsa end blocks. Shape R-7 and the end blocks as shown on the plans. Sand the completed rudder and cover with Super MonoKote or Solarfilm.

FUSELAGE:

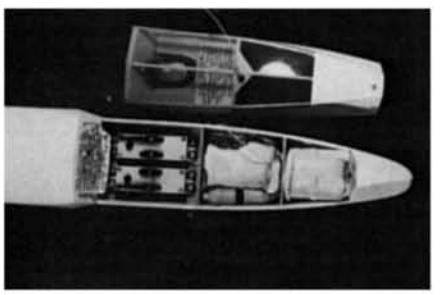
Lay wax paper down over the plans and pin down F-1, then glue the 1/8" x 3/16" lower spruce longerons to F-1 (steam bend to the approximate shape first; this includes all longerons). Glue in the formers F-2 through F-7 and F-8 through F-16 (glue F-6 to F-6A first).

Accuracy is extremely important when epoxying the brass tubes to the formers in the following steps. The tubes must be parallel with the bottom of the formers. It is advisable to glue former F-20 to F-17 with Titebond first and, likewise, F-23 to former F-21. Before the glue dries, check to see that F-20 and F-23 are parallel and lined up with the longeron notch as shown on the plans. Now, epoxy F-17,

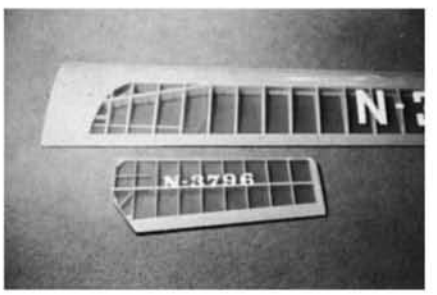
Snoopy's nose section. Note wing rod, band hold-down holes. Adjustable skid.



Canopy removed. Plenty of room in the nose for almost any propo system.



Transparent MonoKote clearly shows wing and flying stab structure.



F-19, F-18 and the 7/32 O.D. brass tubing together, making certain everything lines up. Now, epoxy remaining formers F-21, F-22, F-24, and the 3/16 O.D. brass tubing together. Next, glue in the former assemblies with tubes, using false ribs F-26 (both sides) as guides to obtain the proper spacing for the wing wires. It is a good idea at this time to insert the wing wires and carefully attach wings to see if they mate properly (make sure that you support the wings with this operation).

Glue in all lower 1/8" sq. hard balsa diagonals, then add the top 1/8" sq. spruce longerons, followed by the 1/8" sq. spruce front top longerons. Lay in the pushrods at this stage (they cannot be installed later unless you use NyRod); glue on the completed rudder assembly, and hook up the elevator pushrod. Add the 1/8" sheet balsa fill-in to both sides of the fuselage (one side has a cut-out for the rudder pushrod). Next, glue in the remaining 1/8" sq. hard balsa diagonals and add the 1/8" sq. spruce along the top at the center. Glue on F-29, 1/8" balsa at the rear of the fuselage, and false ribs F-26. Add F-31, F-30 and the fill-in at the front of the fuselage using 3/16" sheet balsa as indicated on the plans.

Now, remove from the building board and add formers F-32 through F-37 as well as the two F-38's. Glue in a 1/4" x 3/8" hardwood anchor (blind nuts previously epoxied in place) and add the 1/8" sq. spruce longerons. Fill in the lower area with 3/16" sheet balsa as indicated. Glue on the nose block and sand the entire fuselage to shape. Now glue on the ¼" sheet fairings F-25 and sand to the shape shown. Glue in the hardwood servo rails at this time to fit your servos.

Spot glue the lower 1/8" sq. balsa to the fuselage (the canopy framework is built on the fuselage, so make sure you steam bend to exact shape before spot gluing). Spot glue the roughly shaped balsa block C-3 and add C-1 and C-2 to the framework. Drill a 3/16" diameter hole for the dowel through C-1 and F-6A and carefully glue the dowel into C-1 only. Add the 1/8" sq. balsa to the center and to the sides. Sand the canopy to shape as shown, then carefully cut loose the spot glued area in order to remove it. Drill a 3/32" diameter hole and epoxy a washer in place for the hold down screw.

MonoKote or Solarfilm the entire fuselage and glue in the 1/8" plywood skid F-39. Drill the holes for the # 4-40 screws to hold on the adjustable tow hook. Carve and sand to shape F-41 and cover, then glue in place.

Attach the control horn to the rudder and epoxy the Klett hinges to the rudder as shown. Now, epoxy the hinges to the fuselage (remove the hinge pins first). Attach the rudder to the fuselage and hook up the rudder

Otto Heithecker of Royal Oak, Michigan; the winningest pilot in the ECSS contest circuit after another one of his "lucky" flights at the DCRC contest 4 June 1972. Five rounds were flown by the 52 contestants with lots of time left over. In the first four rounds the total of all of Otto's flights was only 7 points (seven seconds) off of perfection for 40 minutes of flying and spot landing – 2593 points out of a possible 2600 – some luck! Dick Jansson photo.

pushrod.

COVERING:

The wing, tail surfaces and fuselage were covered with Super MonoKote. I believe this is the best material available today for finish, durability, low drag, and it is easy to apply.

RADIO INSTALLATION:

The original model used the Heathkit GD-47 battery pack and servos. The receiver is the Heathkit GDA-57-2 which is smaller and much lighter than the old GD-47 receiver. There is plenty of room to install almost any of the R/C systems on the market today.

FLYING:

Check all surfaces for proper alignment and make sure they are free of warps. It is important that you have proper washout at the wing tips as indicated on the plans.

Add ballast to the nose until it balances at the CG position shown (I prefer to balance ¼" in front of the CG for the initial flights). After the initial flights, remove any excess weight from the nose until it is on the verge of stalling. This will give you the best glide ratio, which will help you ride marginal lift to the best advantage.

I do not recommend hand glides to check trim unless you have a great deal of experience. If, on your first flight you encounter stalling, you must reduce incidence of the flying stab by turning the clevis on the pushrod in order to shorten the pushrod. The clevis should be on the end of the pushrod that attaches to the servos. Adjust until you achieve straight and level flight.

Most of my towing is by electric winch, although it has been hand towed and I have used the Hi-Start extensively when out flying alone. You will find that the average winch speeds will be adequate for towing.

I have flown many flights in all types of weather conditions and that includes rain and snow. This ship was designed for light air with winds to approximately 12 mph. It is recommended that you add ballast when the wind exceeds 12 mph in order to achieve satisfactory penetration. Adding 5 oz. to the CG will suffice for up to 18 mph winds and 8 oz. will do the job to about 22 mph. Above 22 mph winds, add weight until the ship penetrates properly. Adding weight to the CG does not affect the flying characteristics, but will increase the sink rate depending on how much weight is added.

The best thermal flight to date was 1 hour, 5 minutes, taking advantage of three different thermals.

Here's hoping you will have as much enjoyment flying your "Snoopy" as I have had. □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