By Dennis Tapsfield

Dennis was hooked on the Spacewalker the first time he saw a photo of it in "Sport Aviation." His .61 powered model does all he had hoped for and is a real crowd pleaser.

ABOVE: Dennis Tapsfield's beautiful scale "Spacewalker." RIGHT: Jesse Anglin in the cockpit of full size Spacewalker he designed.

SPACEWALKER

Designer/builder Dennis Tapsfield about to put the Spacewalker in the air — what a flying field!

SPACEWALKER
Designed By:
Dennis Tapsfield
TYPE AIRCRAFT
Sport Scale
WINGSPAN
91 Inches
WING CHORD
15½ Inches
TOTAL WING AREA
1368 Sq. In.
WING LOCATION
Low Wing
AIRFOIL
NACA 2415
WING PLANFORM
Constant Chord
DIHEDRAL EACH TIP
3½ Inches
OVERALL FUSELAGE LENGTH
63 Inches
RADIO COMPARTMENT SIZE
Ample Room
STABILIZER SPAN
26 Inches
STABILIZER CHORD (inc. elev.)
9½ Inches (Avg.)
STABILIZER AREA
234 Sq. In.
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
12 Inches
VERTICAL FIN WIDTH (inc. rud.)
9 Inches (Avg.)
REC. ENGINE SIZE
.60 2-Stroke; .70-.80 4-Stroke
FUEL TANK SIZE
11 Oz.
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rud., Elev., Ail., Throt.
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa, Ply
Wing	Balsa, Ply
Empennage	Balsa
Weight, Ready To Fly	**165 Oz. (10 Lb. 5 Oz.)**
Wing Loading	**17.3 Oz./Sq. Ft.**

ABOVE: Beautiful built-up dummy engine from balsa, ply, and resin.

Lift-off time for another successful flight. There's that field again.

Spacewalker is a new homebuilt aircraft designed by Jesse Anglin who formed Country Air Inc., in North Carolina. Being a member of the Experimental Aircraft Association, I receive their monthly magazine Sport Aviation, and it was in this magazine that I first saw a picture of Spacewalker when it made its debut at Oshkosh in 1986. It really attracted me and I thought that with its striking color scheme, it made the aircraft a perfect subject for a super model. A number of letters, plus a telephone call, were necessary to get the information, but I finally had all that was required to make a start; this was in Sept.-Oct. '87. I really needed to keep the weight below our 11 lb. limit, not only to be able to fly in Windsor Great Park, but to be able to power it with a sport .61 2-stroke engine. Since I like large models, I chose 3½" to 1', giving it a 91" span and a chord of 15¾" with almost 10 sq. feet of wing area! If I could keep the weight around 10 lbs., we would be looking at 16 oz./sq. ft. wing loading. I did it! All models fly better if they are lighter (within reason of course). Remember gliders have about 9-12 oz./sq. ft., so we are not really looking at a paper bag, just a lightly loaded scale model that will fly at a realistic speed and be adequately powered with any sport .61. I powered mine with a Merco 61, a

Neat instrument panel and pilot gives it the final details.

real favorite of mine for many years. This model handles well and is a great crowd pleaser. If you are interested, here's how to build it.

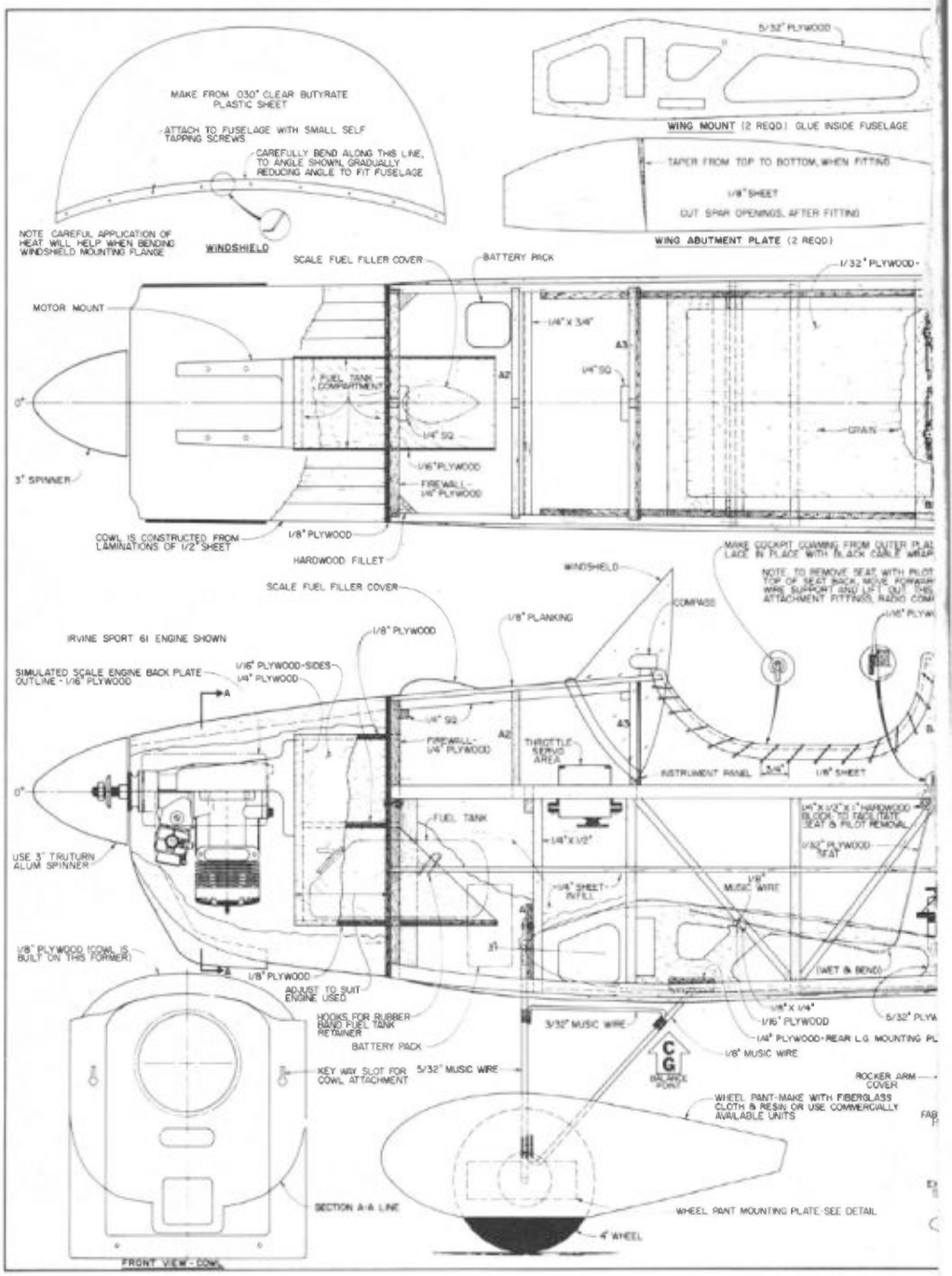
CONSTRUCTION

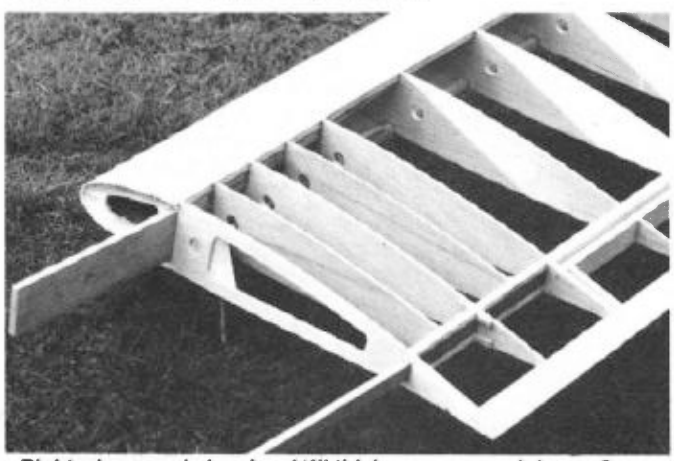
Wing:

The wing is quite conventional, so start by cutting all the ribs as shown. Take note that the main spar position on the left wing is 1/4" farther forward than the right, so that they will overlap in the center. Build each wing panel over the drawing in the usual way, ignoring the ailerons at this point; just build the complete wing.

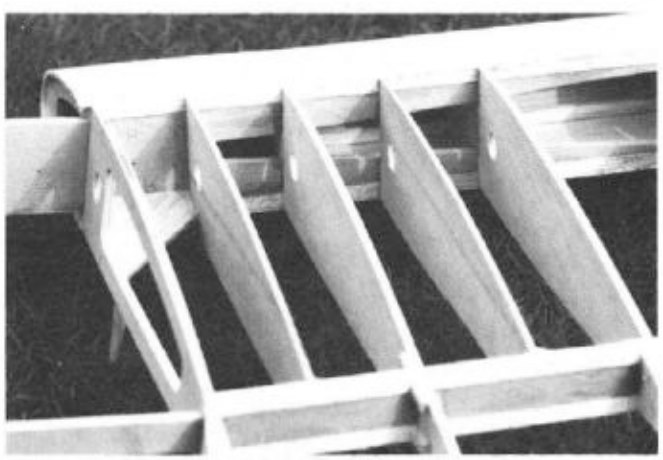
When the spars are in, roll the wing onto the lower trailing edge, and glue the ribs in position. When set, add the top portion of the trailing edge. With the leading edge in place, the structure is reasonably integral, so remove it from the plan, and then add webbing between the top and bottom leading edge spars.

The final installation is the 1/16" leading edge sheeting. The best way is to make up the whole piece with three 3" wide sheets edge glued to produce a sheet 9" x 40". If you are not sure how to make up the skins, proceed as follows: Trim the edges of the 1/16" sheet balsa with a straightedge and balsa knife; butt the edges close together and cover the joint with tape (cellophane or masking-1/2" is okay) for the full length. Open the joint like a book, apply glue to the exposed edges (make sure that the glue you use will sand easily), close the joint, remove the excess glue, and tape over that side. When completely dry, wet the center outside surface of the sheet with 50/50 household ammonia and water, and apply white glue to the ribs, spars, and leading edge where the sheet will contact. Wrap the 1/16" leading edge sheet covering around the leading edge, and hold in place with 1/2" or 3/4" wide tape on each rib by wrapping around from top to bottom. When you have done this, immediately place the wing back onto the plan with the 1/4" sq. in place

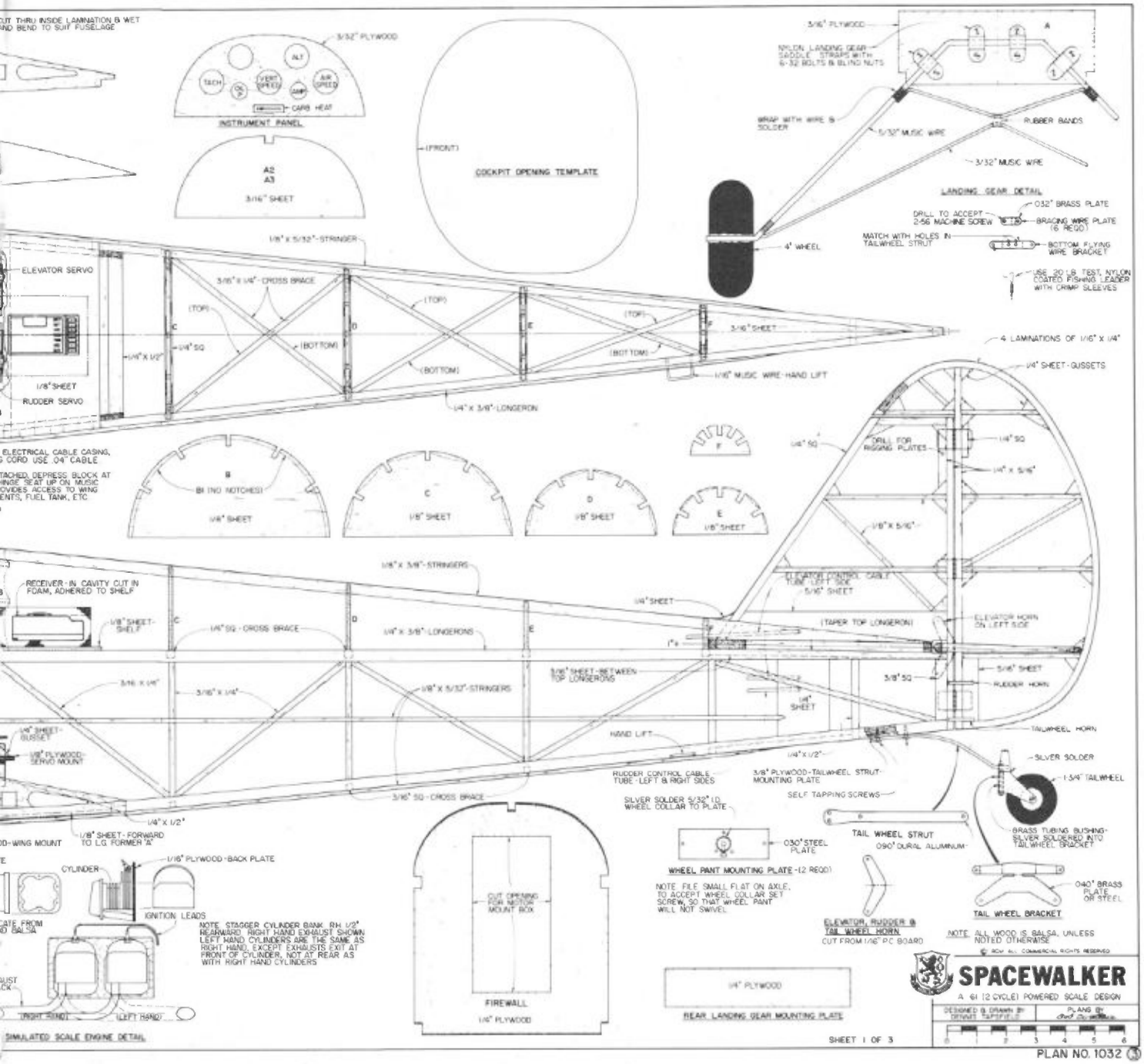


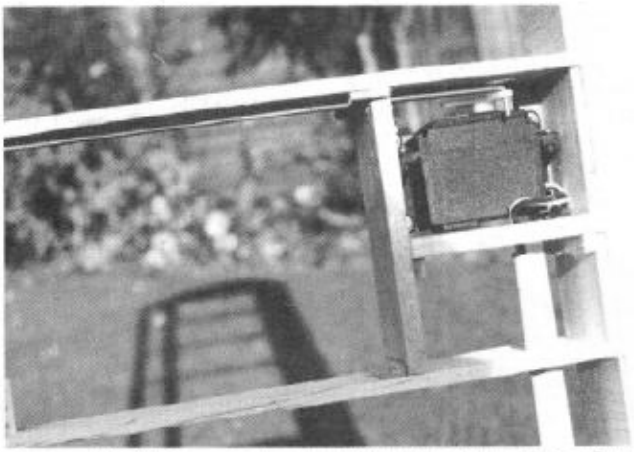


Right wing panel showing 1/4" thick spruce spar joiners. Spars are offset so they can be bolted together inside fuselage.

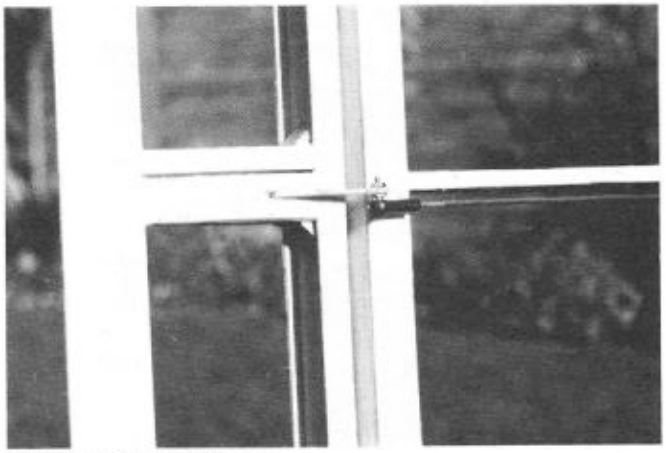


Close-up of front spar joiner. End rib is plywood.



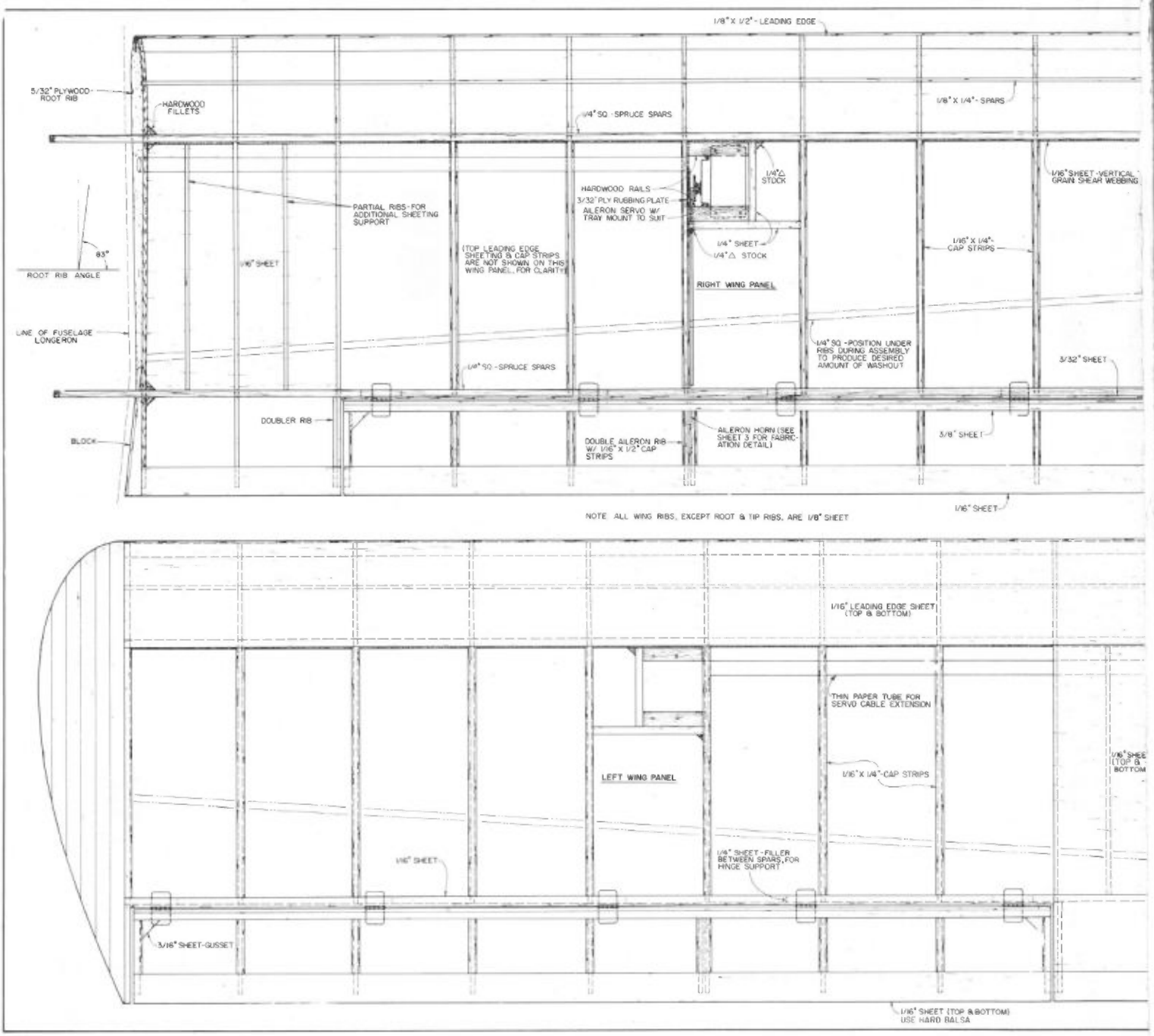


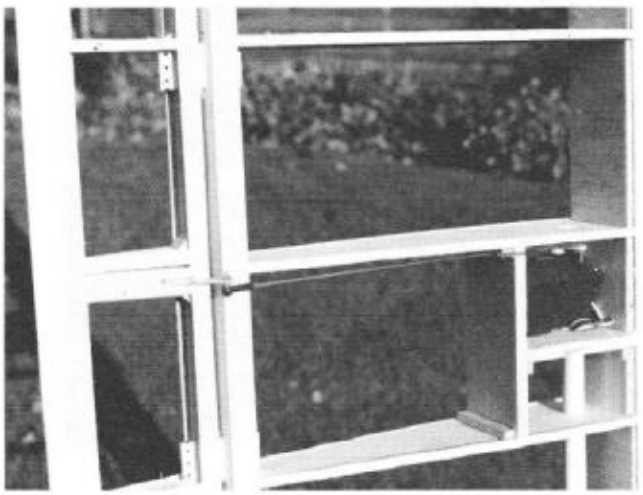
Servo mounted in each wing panel. Straight rod to aileron. Paper tube for servo wiring to travel to receiver.

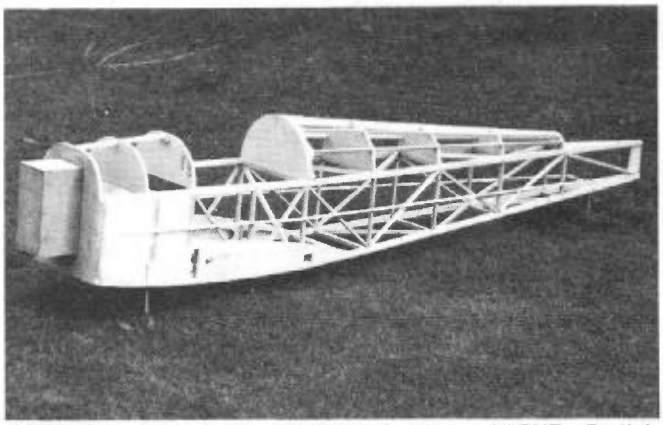


Aileron horn and linkage.

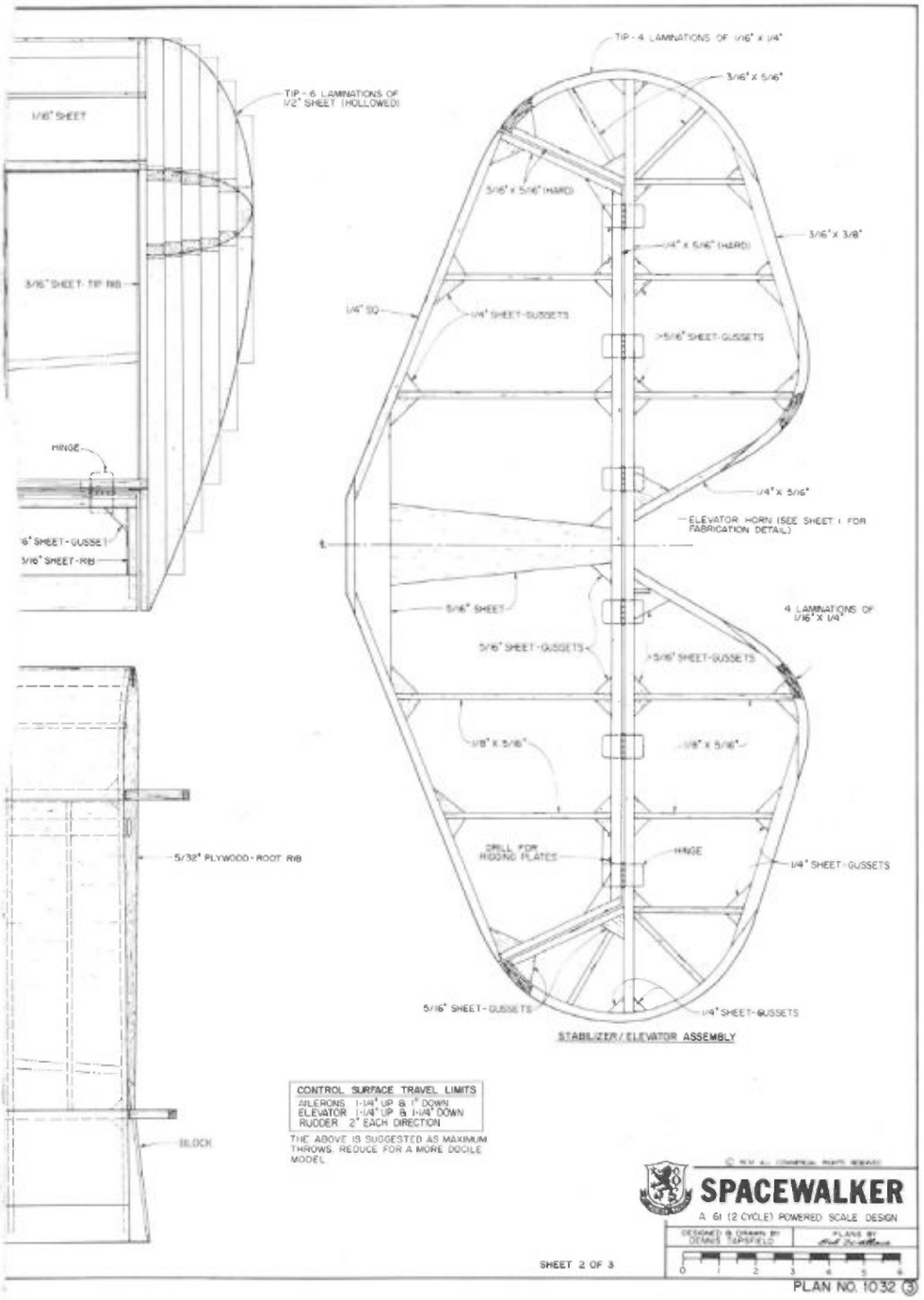
FULL SIZE PLANS AVAILABLE — SEE PAGE 354







LEFT: Complete picture of aileron hook-up. ABOVE: Partial completed fuselage.

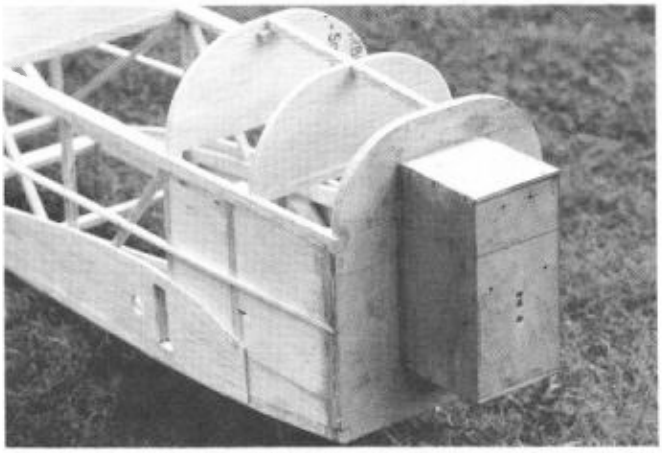


under the wing to produce the washout. You will find you can twist the wing to the correct position before the glue sets. Get it right, as the wing is very stiff torsionally when all is dry. Next, cut the ribs in the aileron area to size, add the aileron spar, capstrips, etc. Complete the wing with the aileron servo and pushrods, horn, etc. The tip is made from laminations of 1/2" sheet hollowed out and shaped as per drawing. The wing is now sanded, the ailerons separated and hinged in place; however, do not glue in the hinges at this time, not until the wing is covered.

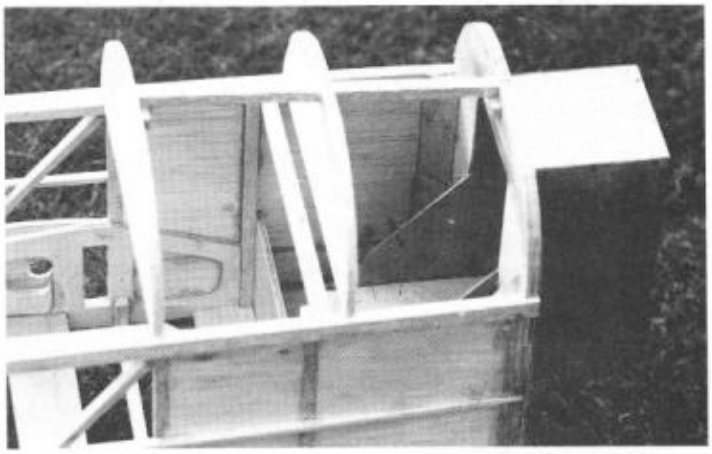
Fuselage:

Build the fuselage sides over the drawing using **very hard 1/4" x 3/8" balsa** for the longerons and medium balsa for the remainder. Cut the firewall from 1/4" ply, remove the center and build out the box to carry the engine mount, making sure that the amount the box protrudes suits your engine and mount combination. Crack the top and bottom longerons at B-B1 and join the sides, starting at the firewall in the usual way. Fit the 5/32" ply wing mounts inside the fuselage flush with the bottom longerons. **This is important** as it controls the wing incidence. Make sure everything is square, and complete the fuselage per drawing. Note that the top longeron is tapered off to provide positive incidence on the stabilizer. Drill the landing gear mount "A" before gluing it in; this is important.

It is now time to make and bolt the landing gear in place. Go over the drawing carefully to make sure all the bits are in! Don't forget a piece of nylon tube for the rx antenna inside the fuselage! Make the cowl from laminations of 1/2" balsa and shape as shown, building onto the 1/8" ply former. Drill holes for access to the glow plug and needle valve. It is a good idea to have the engine and spinner fitted at this time, to line everything up. The dummy engine is well worth taking a bit of trouble with. The



Plywood box for engine mount — check your engine to make sure it is the right size.



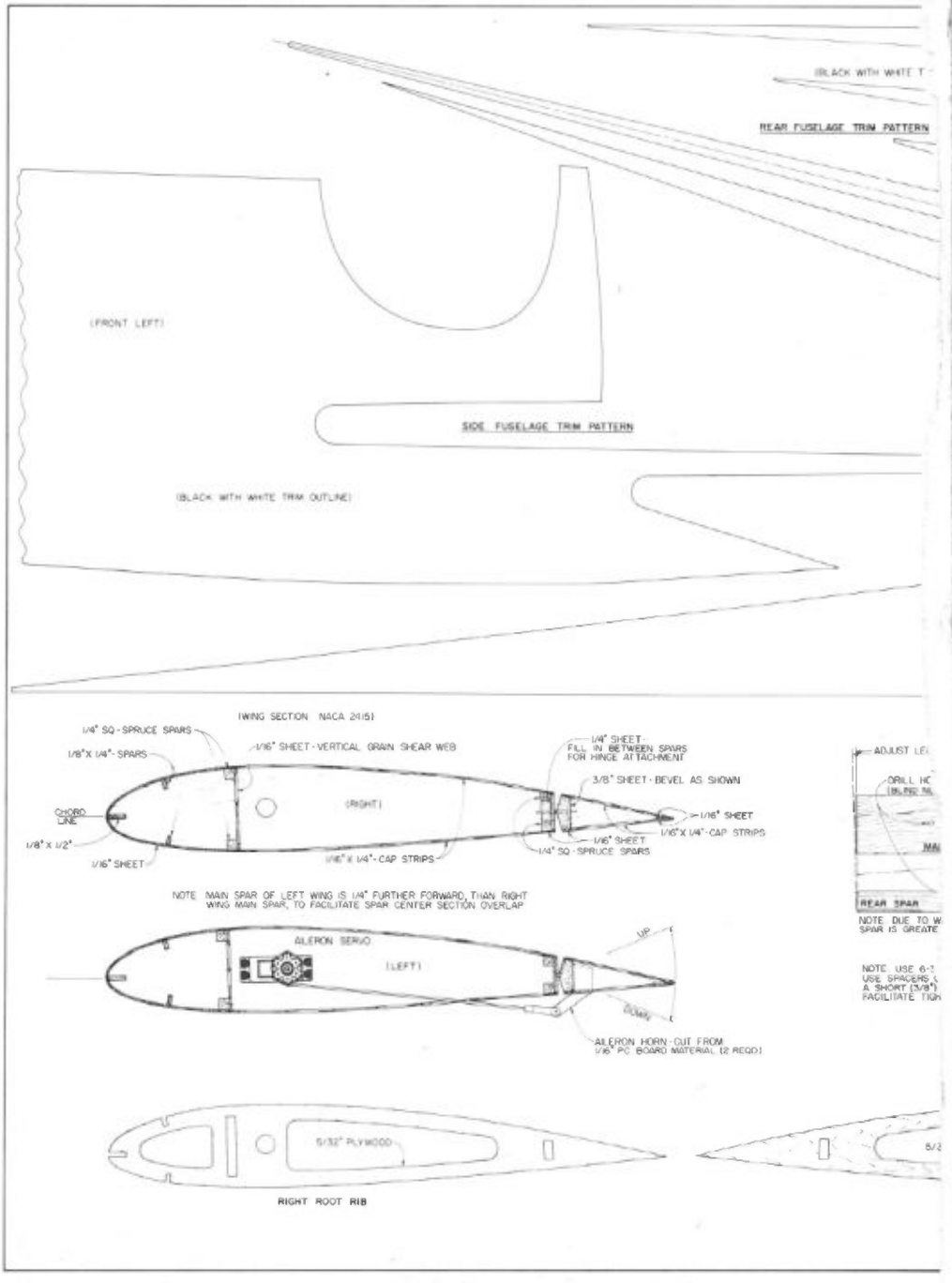
Looking inside fuel tank compartment. Note hook on far side for rubber band to secure tank.

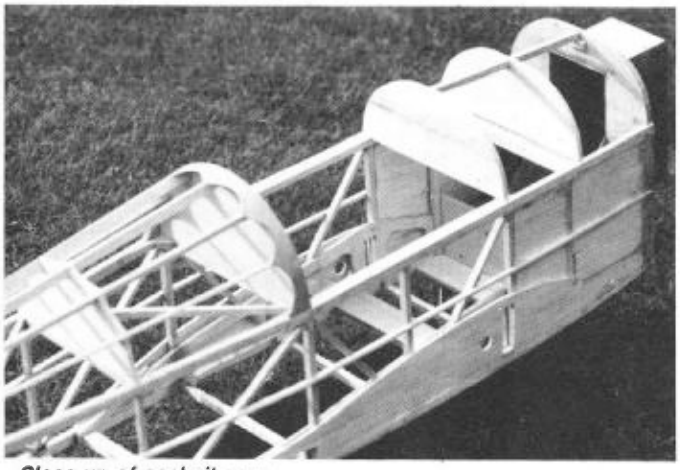
cylinders can be made from **hard** balsa or something similar. Saw cuts simulate the fins. The rocker covers are cast in resin. I made a model in plasticine (modeling clay) mounted it on a 1/16" ply base the shape of the cover and coated it with clear dope. When dry, brush on a film of Vaseline to prevent the layer of silicone bath sealant from sticking to it. Coat the whole thing with bath sealant and leave to dry for 48 hours. The result is a good mold into which you pour the mixed resin. A 1/2" x 1/2" x 3/16" piece of balsa reduces weight and provides a surface to stick to if pushed down flush in the resin. A bar laid across the top of the mold will keep it in place.

Tail Group:

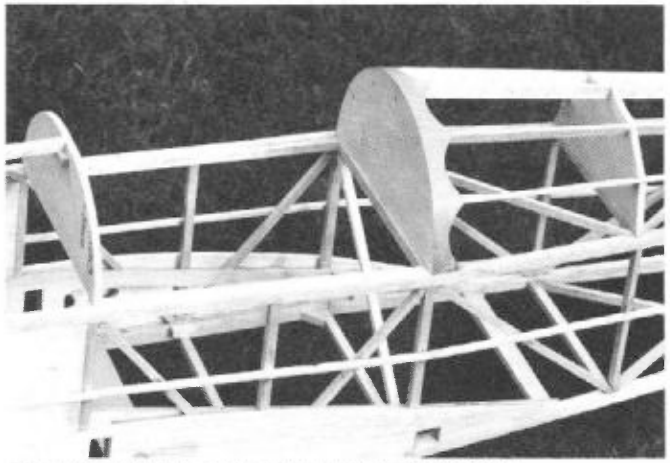
This is quite straightforward, though perhaps I should explain the laminated rudder outline and tips. It will be easier if after cutting the laminations you insert a row of pins on the **inside** (this is important) of the curve, glue the laminations together with white glue and, while wet, wrap the unit around the pins, placing pins around the outside as you go, and leave the whole thing to set. The result is a light, very strong outline, better than any other way I know. The rest is simple enough, just don't build in any warps! Use epoxy to fit the horns and rough them up well where the epoxy holds.

No doubt you can now start to get the whole thing together to see what it looks like. This is the time I get the radio installed, together with the cable runs for the rudder and elevator. I used the larger T arm on my Fleet servos for the closed loop system which works very well. Both my Fleet PCM and the 35meg FM system handle the long extension leads required for each aileron servo. *(Editor's note: Dennis lives in England.)* Make sure that your radio does not object to the long leads as some makes require a choke to overcome glitching. Check that the surface movements are correct per the drawing. The throttle servo is



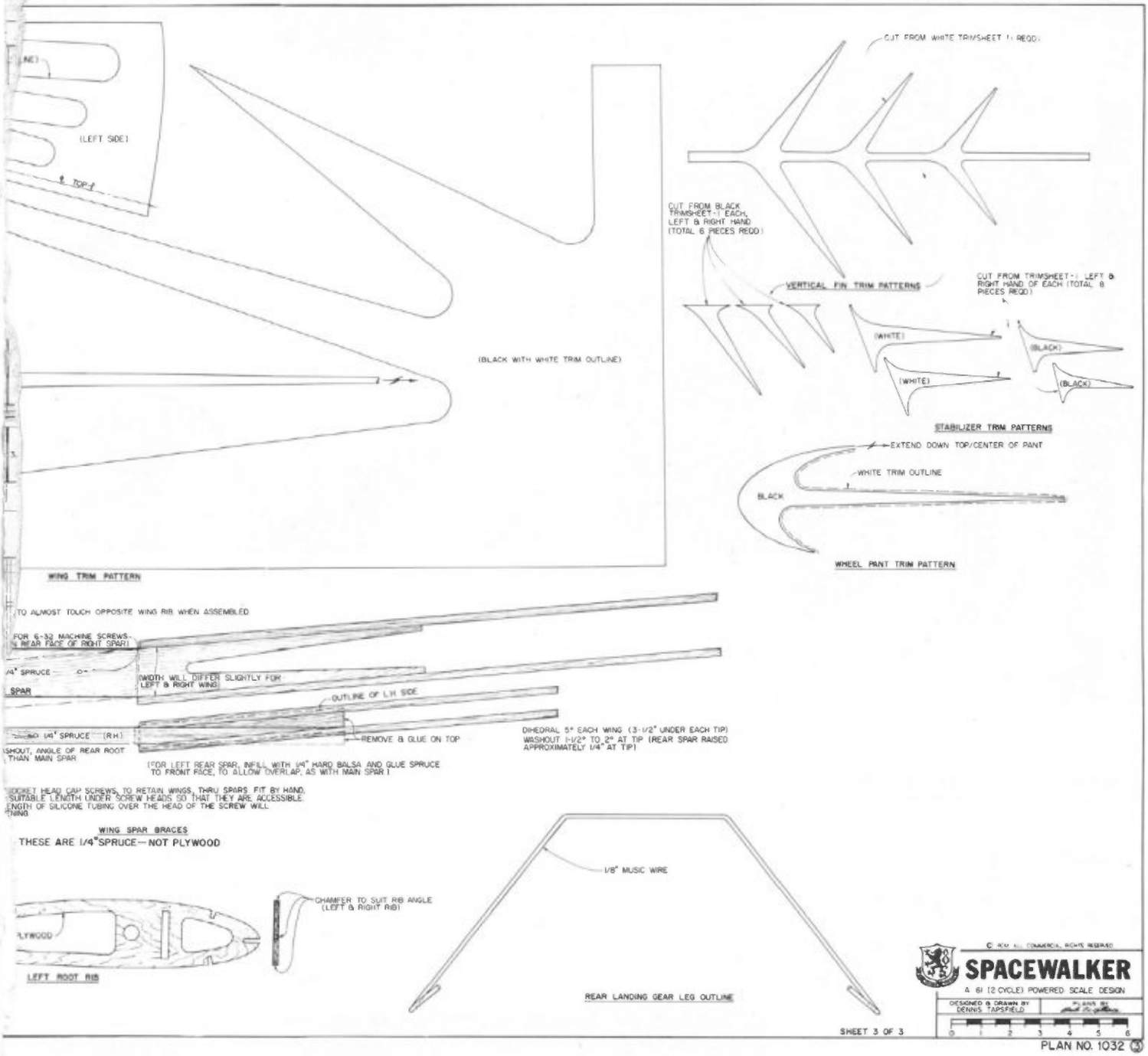


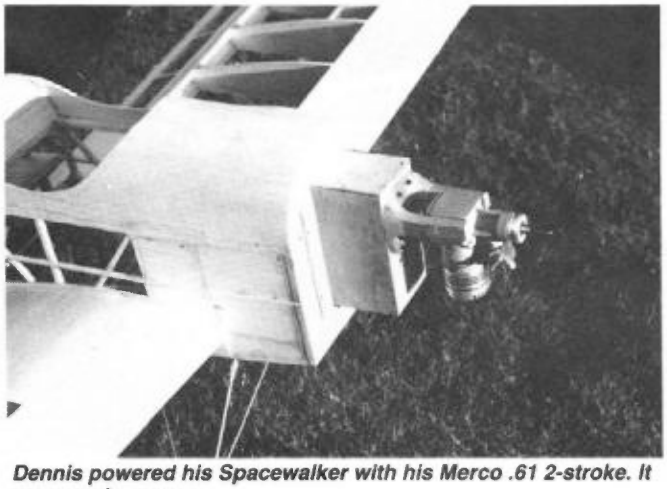
Close-up of cockpit area.



Thin ply scallops wrapped around cockpit former.

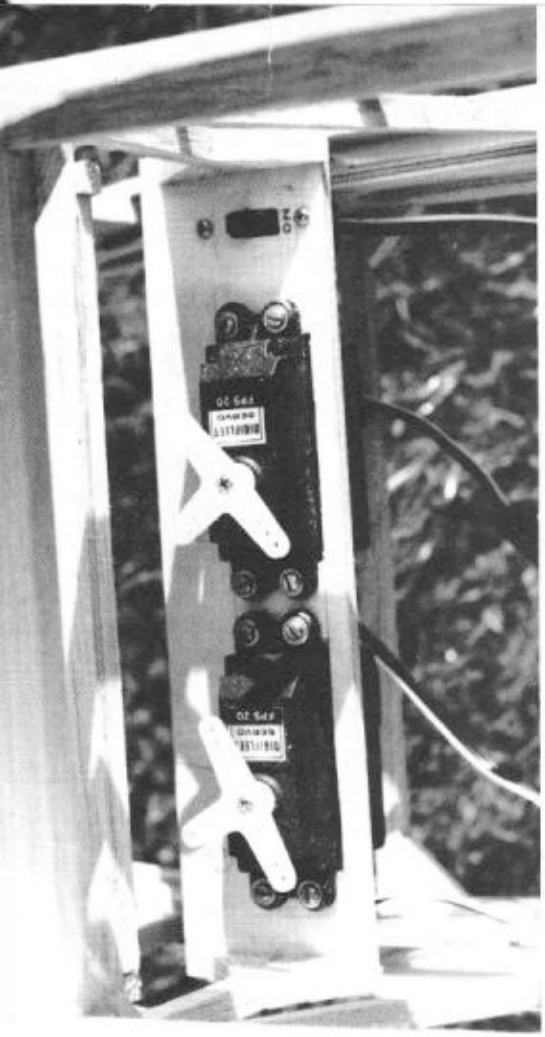
FULL SIZE PLANS AVAILABLE — SEE PAGE 354



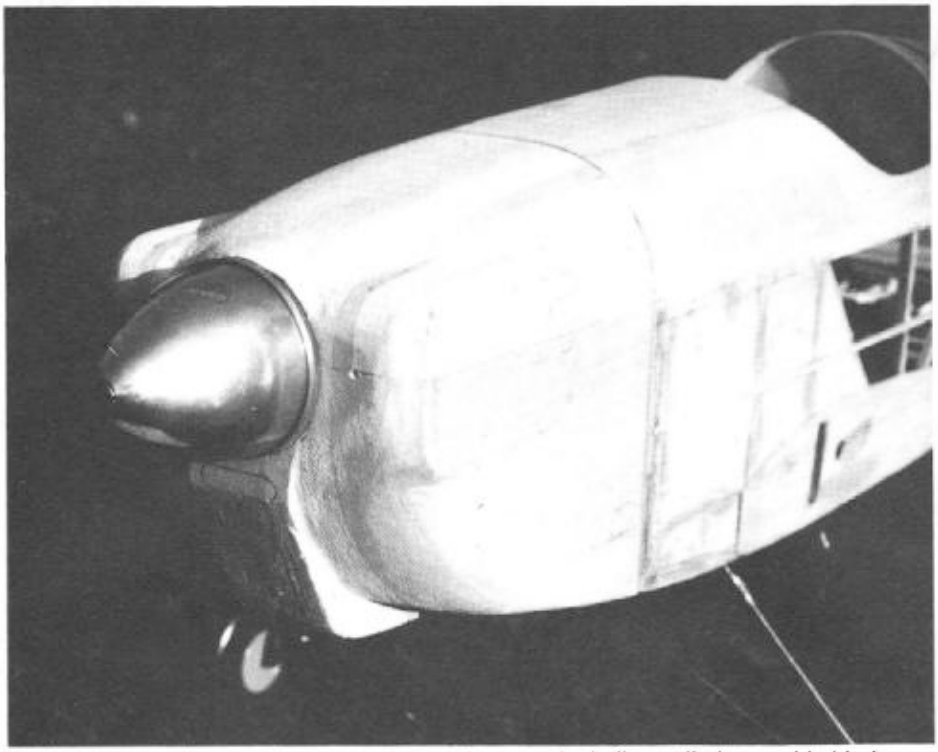


Dennis powered his Spacewalker with his Merco .61 2-stroke. It was ample power.

Photo shows location of rudder and elevator servos. They are covered by pilot's seat.



Close-up of servo mounting. Cables used for pull-pull control system.



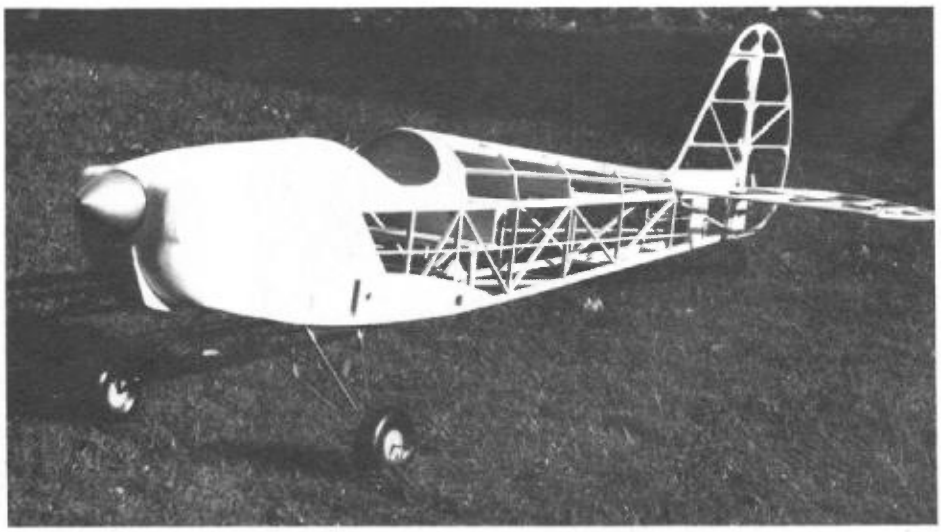
Balsa block cowling rough shaped. A fiberglass one including cylinders molded-in is available from T & D Fiberglass Specialties. See plan ad.

mounted on an aileron servo tray on the left, inside the cockpit just forward of the instrument panel and fairly high up. You may have to relocate yours depending on the engine. The battery is pushed into a cavity cut into a piece of hard foam beside the fuel tank. The rx is on a shelf above the servos in the fuselage, pushed into a cavity cut into a block of soft foam glued to the top of the shelf. An extension for the on-off switch is a wire carried forward into the cockpit area. Remember you may have to relocate the battery depending on the Center of Gravity requirements.

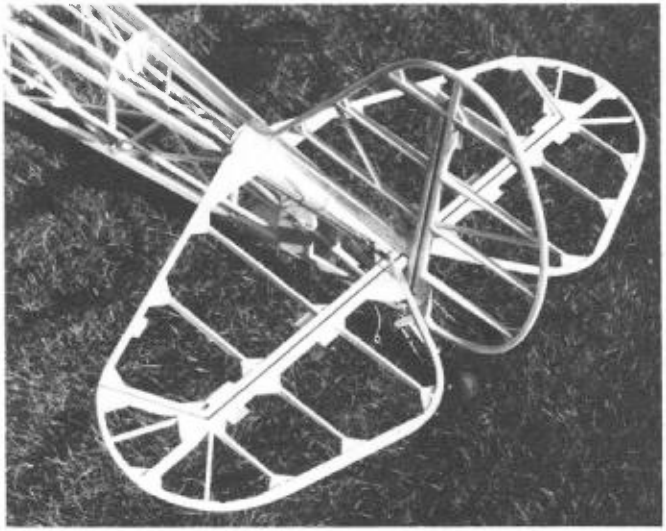
Covering:

Note: The registration and color scheme as shown is authentic.

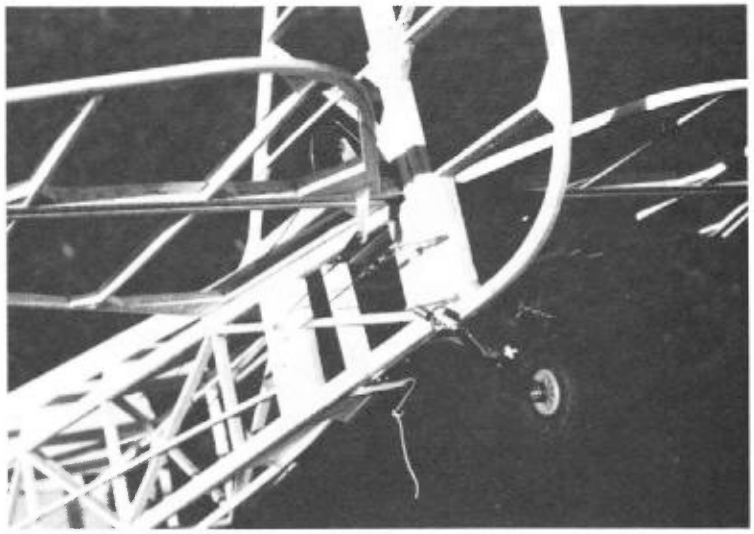
My model was covered using red (not Fokker red), Solarspan or Black Baron film. The trim design looks difficult, but applied in the right way, it is reasonably easy. First, you should cut out the trim shapes, lay them in position on the model, and mark their positions using a ballpoint pen. Mask off around the shapes keeping the tape off of the area that is to be red. I did not mask the round portions since, because I was brushing the black, I could paint around them. When the paint is touch dry, remove the masking tape and allow to dry completely. Meanwhile, cut a lot of 1/16" wide strips from Coverite's White Graphic Trimsheet by taping the sheet onto a board and using a steel straightedge and balsa knife. The rounded portions must be cut to shape. I used a balsa knife blade in a pair of compasses and it worked out okay, and it sticks great. Just one thing, try not to handle the adhesive surface more than you have to. I found that a pair of tweezers was most helpful. The undercarriage is covered with film and painted black. The wheel pants are first painted red (matching the film color) then, when dry, mark the shape of the trim, mask off, and paint with black enamel. The 1/16" white lines are cut from a trim sheet to the correct shape using twin blades 1/16" apart. The trim shapes for the fin and stabilizer are cut direct from trim sheets and stuck on. For registration letters, I used 72 point Letraset on white trim sheet, which were cut out leaving the white border, then the whole thing was stuck onto the rudder. It worked out perfectly. Now check out the balance point. Do get this right, remembering a little nose heavy is better than tail heavy. You can now add the windshield, the



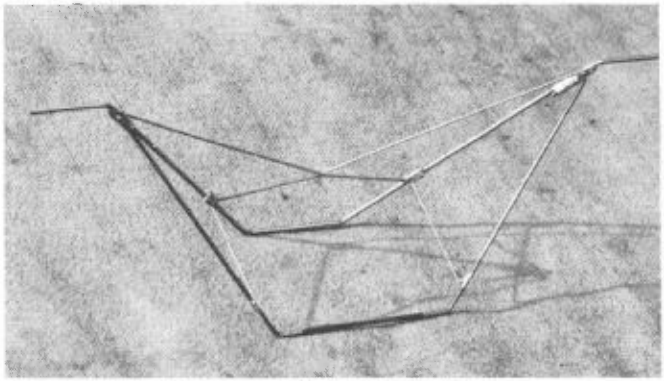
Fuselage is now ready to cover.



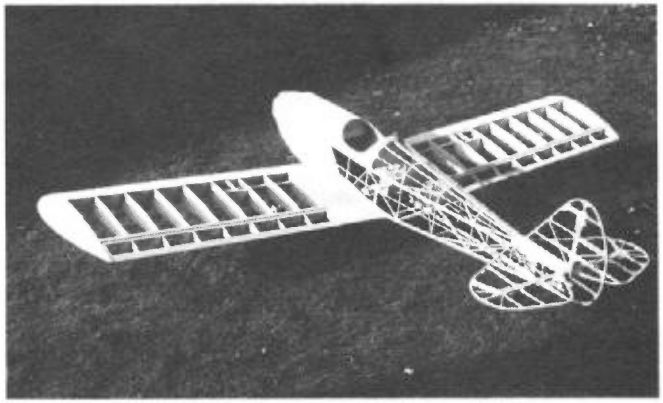
Completed tail group. Curved outlines made from four layers of 1/16" x 1/4" balsa. Makes one of the strongest ways to build. Takes some extra work but well worth it.



Looking at underside of tail showing horns, clevis, and cable. Note tube for antenna out the bottom.



Completed landing gear ready for installation.



Completed framework awaiting the covering phase.

cockpit coaming, and other external details. The instrument panel consists of a piece of 3/32" ply using some of the scale instruments available at your hobby shop.

Flying:

Choose a fairly large propeller for the model. My Merco is quite happy to swing a 13 x 6, and produces more than enough power for the model. Take-off is very realistic, and the climb-out is good. The speed envelope is very large. The model can be flown very slowly, yet on full power and is surprisingly fast and maneuverable. Loops, rolls, and inverted flight are all well within its capabilities, and smooth slow landings are the rule rather than the exception. I do hope you enjoy building and flying this unusual aircraft as much as I have. Good luck with your project. Happy landings.

□