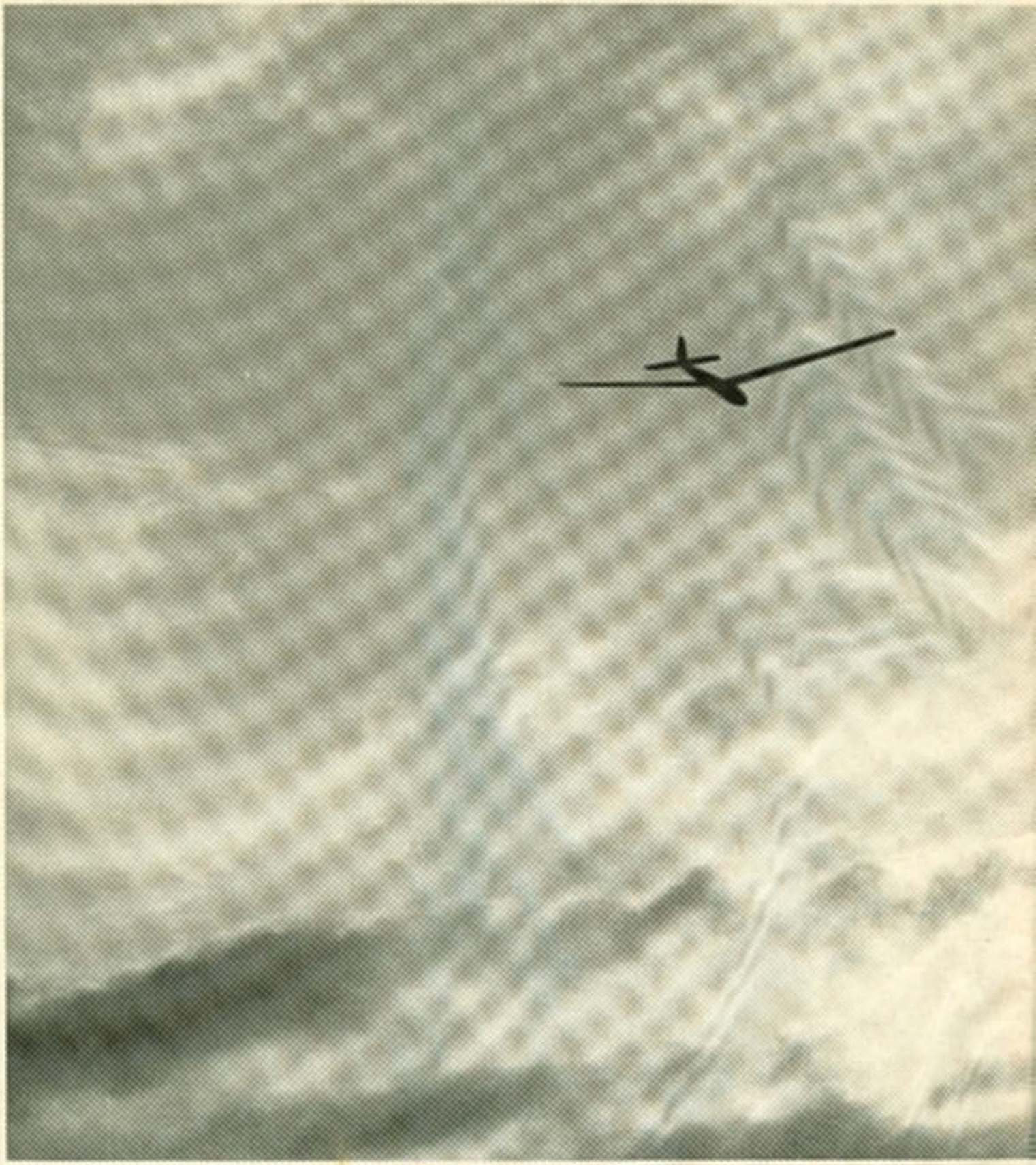


ORANGE JULIUS

by JW Headley

As usual, we didn't have a model to fly, (one of the many problems of living in California is that there are too many flying days, and not enough building nights). This, and the recent purchase of a nice new three-channel proportional set (suitably disguised as a lawnmower in the family checkbook), brought on the usual crisis of what to build. Looking through the pathetic heaps scattered around the garage floor, there seemed to be a shortage of gliders, our latest glider having struck a large rock which happened to be floating on El Mirage dry lake, during a recent flying session out in the desert.

We've always been more interested in the easier-to-build type of model and, as a rule, anything that takes over two weeks to construct usually never gets finished. With this sort of time schedule, it's obvious that there isn't too much time to spend on an intricate structure, or something that's going to take several months to apply the finish. However, we didn't want a simple retangular box type model, so after a few hours doodling on a few sheets of graph paper, and a brief study of the latest in glider shapes from current magazines, we came up with the lines for the "Julius."

We decided to make the wing all sheet and eight feet in span for a couple of reasons; the first being that balsa sheet happens to come in four feet lengths, the second that we've never had an eight foot span model. We were also interested to see how an all-sheet wing this size compared to a built-up type in terms of strength as well as weight. We were a little worried as the building proceeded that the whole thing was going to be too floppy, but when the final sheeting was applied the wing suddenly became tremendously rigid, and none too heavy. The finished weight of the wing, covered and painted, was actually just under fifteen ounces. The only problem we found was to be very careful handling the finished wing in the workshop, it's too easy to knock things around with the wing tips when moving the wing from place to place.

The total weight of the model, with two servos, receiver, etc., came out slightly over two pounds according to my wife's kitchen scales (these may be a few ounces out either way). At this weight the model flew very well in moderate conditions. A small amount of additional ballast might be required for a very windy day.

We've written a few lines on the model construction as follows. Anyone who has built any of Ken Willards designs should have no trouble with this model.

WINGS

The wings, which are all sheet, are built first. Four sheets of balsa are required, the two bottom surfaces being 3/32" sheet, and the top surfaces 1/16" sheet. These sheets are four feet long, and taper from six inches wide at the root to four inches at the tip.

Author Jack Headley with two prototypes of the Orange Julius. Excellent soaring machine even in lightest air.

Six inch wide sheet balsa can be used if you can find it, but we joined a four inch wide sheet to a two inch wide sheet that had been cut diagonally to give the desired taper.

When these sheets have been made, draw the locations of the spar and the wing ribs on the lower surface using a ball point pen. Pin these sheets down to the building board, making sure that they are flat. Cement into place the main spar, which is made from hard 1/8" sheet, and the 1/4" leading edge. Make the ribs outboard of the dihedral braces and cement these into place along with scrap pieces of block balsa for the wing tip. When both wing panels are dry they are joined using the dihedral braces shown. Add the ribs at the root section and the small pieces of T.E. section to re-inforce the trailing edge, then sand overall. The upper surface sheeting is now added, one wing at a time. Make sure that the wing is not warped at this stage, using plenty of pins and a flat building board. After the top surface is quite dry, sand the leading edge flat and add the 1/8" sheet nose fairing. The correct airfoil shape can now be made, a typical section being shown on the plan. Cover the wings now using your favorite material. Our prototype was covered in medium weight silkspan, then doped. The wings are now complete except for the root fairing blocks, which are added after the fuselage has been completed.

TAIL

The tail assembly is made from 1/8" sheeting and is quite conventional. Use good quality wood, not too heavy, and make sure the hinges revolve freely.

FUSELAGE

Once the wings and tail have been completed, the fuselage can be built. Cut out two fuselage sides from 3/32" sheet, and cement into place the 3/16" square longerons and spacers. When these have dried, the two sides are joined together at the wing station using frame F1 and the spacers at the trailing edge station. When this is all quite dry, join the fuselage sides at the tail, and fill in the remaining spacers, then repeat for the nose section. Add the sheet pieces at the nose and the block balsa at the tail, in the cabin region, and then the nose block. Sheet the underside of the fuselage, and install the cabin floor. Now cement into place the frames F2 to F5 and cover with 1/16" sheeting. This can be made from a single piece

of wood, since the curvature is easily obtained if the wood is first soaked in water. Cut this piece oversize initially, wet, and pin in place temporarily. When dry, trim to the final shape and cement into place. The addition of the wing dowels and the ply sheeting under the nose completes the fuselage. Sand all over and cover.

The canopy is made from a large bubble type canopy reversed. Make up a floor and also a forward and aft former to suit the local shapes, and cement the canopy to these. A hook epoxied to the underside of the floor will provide a suitable attachment for a rubber band to hold the canopy in place.

All that remains now is to cement the tail surfaces in place and connect up the controls. Contour the wing seating rails to fit the wing, and make sure that the wing and tail are aligned correctly. Now install the small filler blocks to fair the wings to the fuselage.

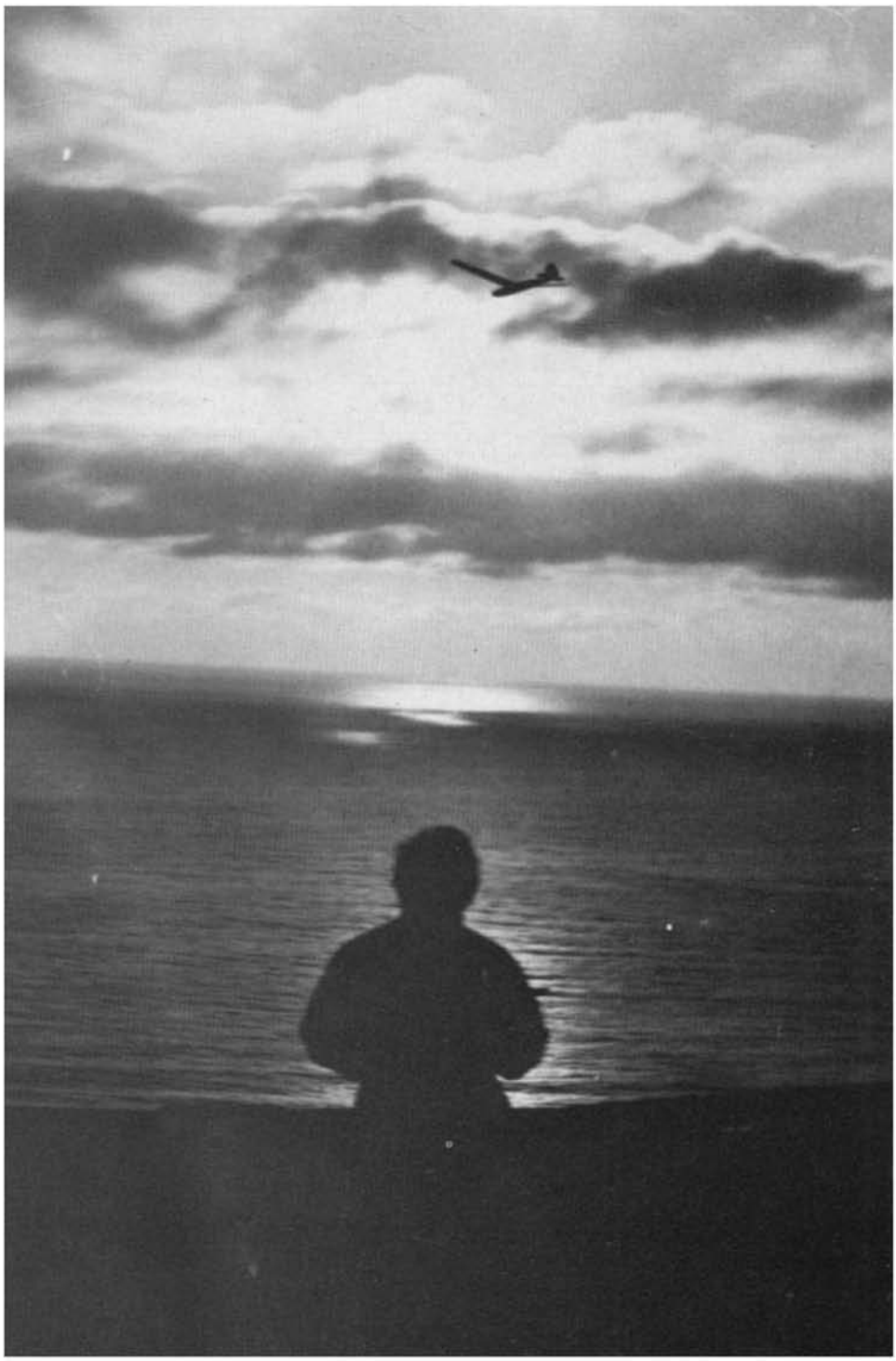
RADIO

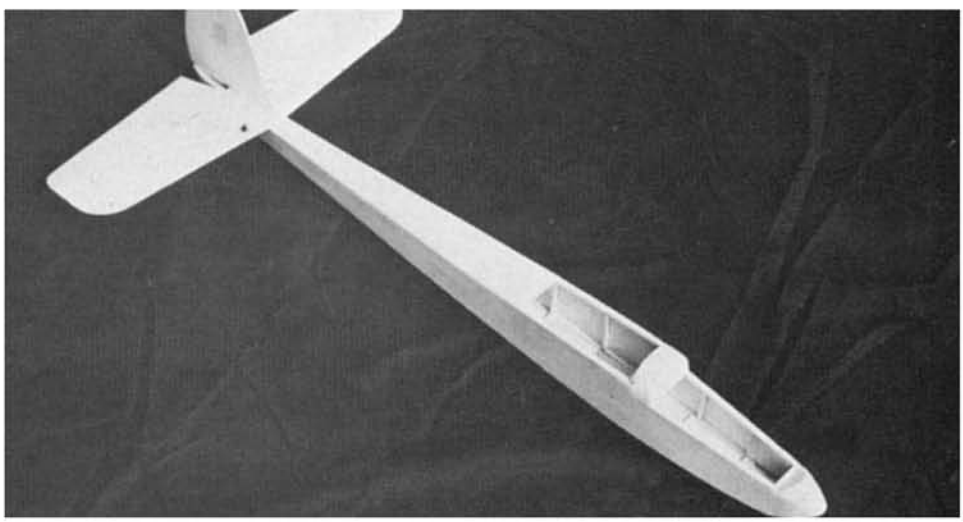
The prototype was fitted with an OS radio, the two servos being fitted on the floor (using double sided sticky tape) as shown on the plan. The receiver and battery pack go in the cockpit region.

FLYING

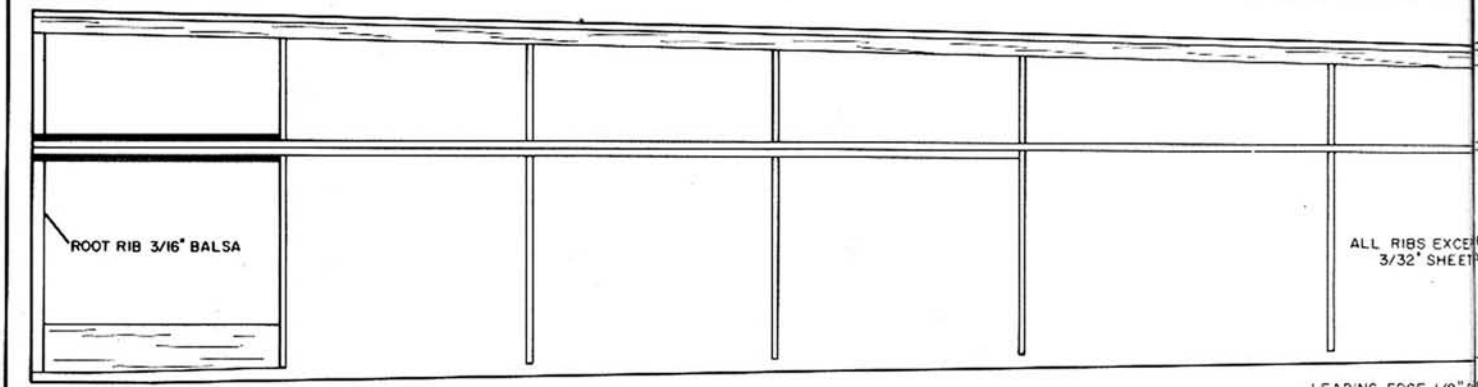
For once we can say the model flew straight from the drawing board. We ballasted the prototype so that the C.G. was at the main spar location, and this is where it has remained. Our first day of flying went as follows. The first flight, ably handled by Kevin Flynn (the builder of -002) was for around ten minutes, the model cruising around the sky very majestically. The second flight saw several series of consecutive loops and spins, and the third flight was cut short after some forty minutes to answer the call of nature (how do these record breakers handle this problem?). This concluded the first day of flying, and a very satisfactory day it was.

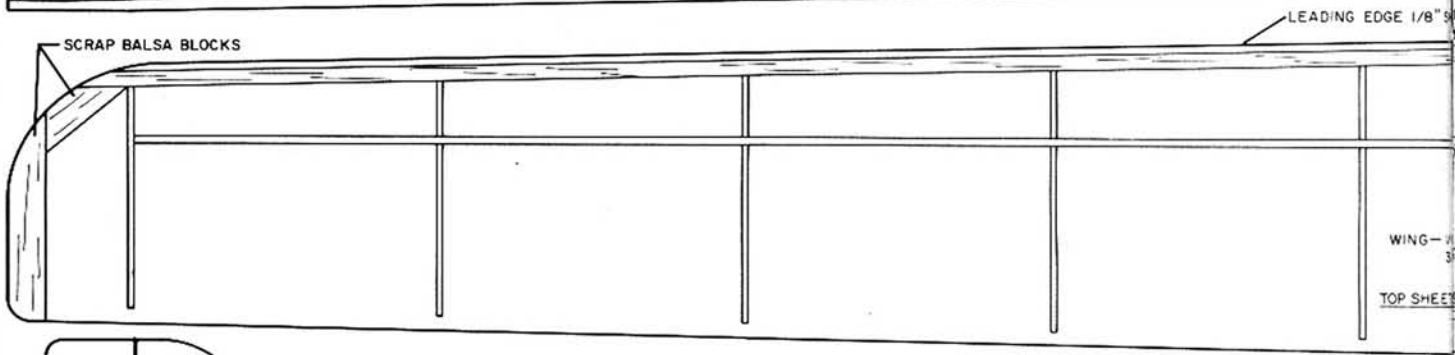
Good luck. □

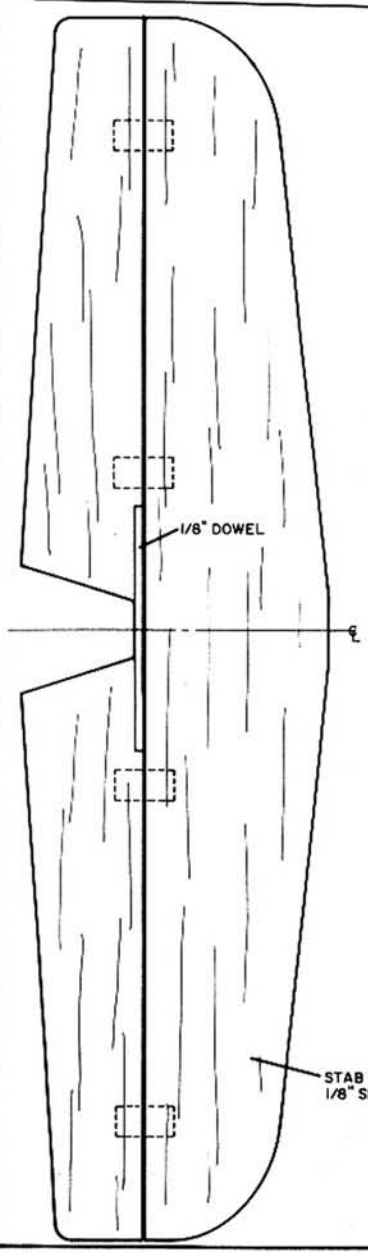


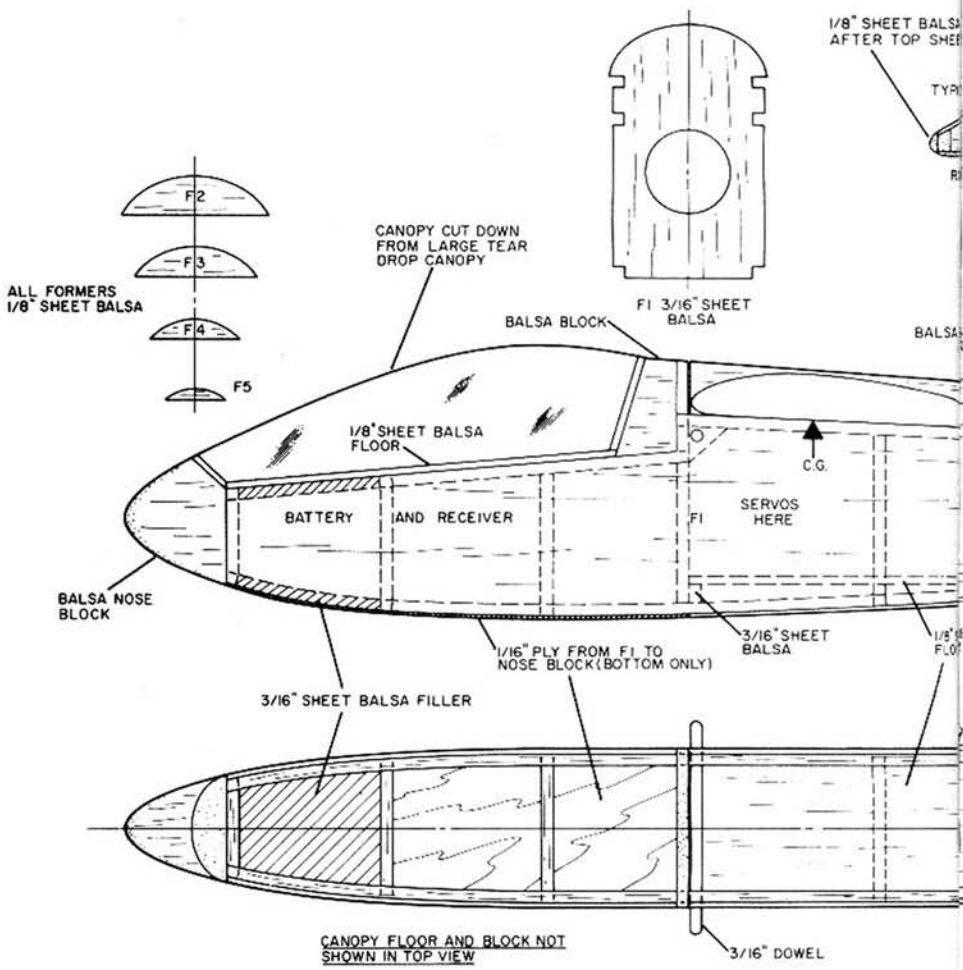


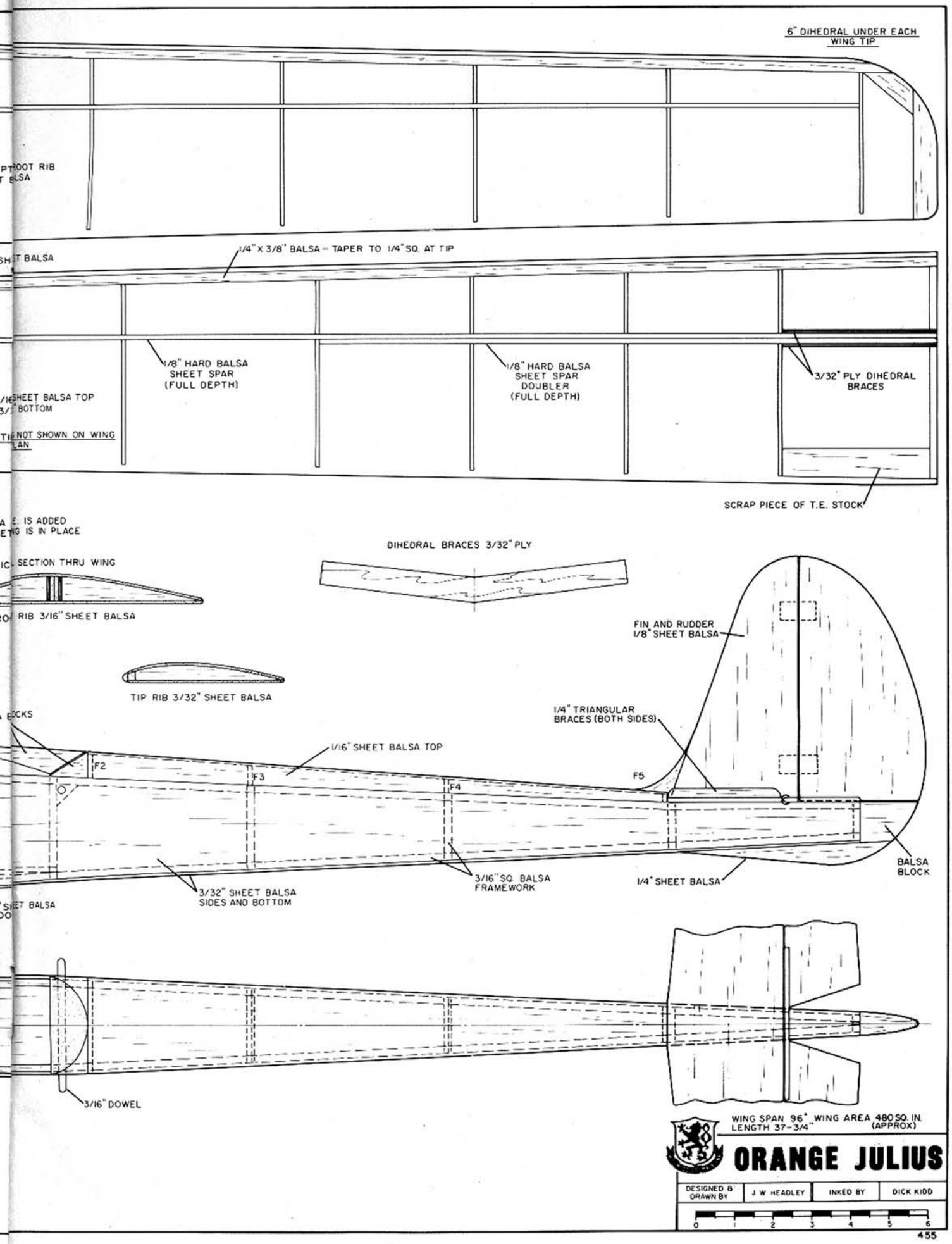
PLANS AVAILABLE ON PAGE 88










6" DIHEDRAL UNDER EACH WING TIP
1/4" X 3/8" BALSA – TAPER TO 1/4" SQ. AT TIP
1/8" HARD BALSA SHEET SPAR (FULL DEPTH)
1/8" HARD BALSA SHEET SPAR DOUBLER (FULL DEPTH)
3/32" PLY DIHEDRAL BRACES
SCRAP PIECE OF T.E. STOCK
NOT SHOWN ON WING PLAN
DIHEDRAL BRACES 3/32" PLY
SECTION THRU WING
RIB 3/16" SHEET BALSA
TIP RIB 3/32" SHEET BALSA
FIN AND RUDDER 1/8" SHEET BALSA
1/4" TRIANGULAR BRACES (BOTH SIDES)
1/16" SHEET BALSA TOP
F2
F3
F4
F5
3/32" SHEET BALSA SIDES AND BOTTOM
3/16" SQ. BALSA FRAMEWORK
1/4" SHEET BALSA
BALSA BLOCK
3/16" DOWEL
WING SPAN 96" WING AREA 480 SQ. IN.
LENGTH 37-3/4" (APPROX)
ORANGE JULIUS
DESIGNED & DRAWN BY
J. W. HEADLEY
INKED BY
DICK KIDD
0 1 2 3 4 5 6
455