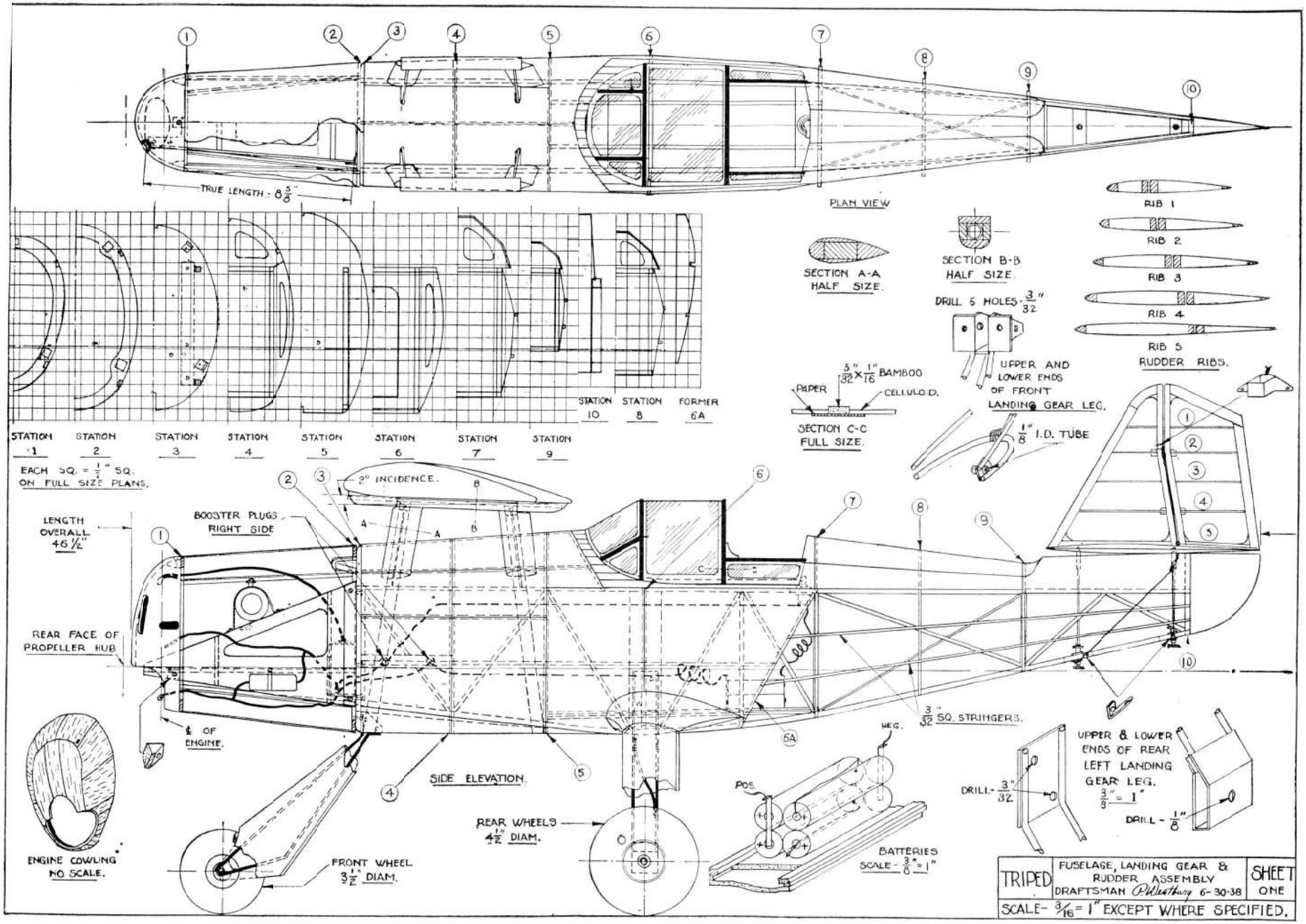
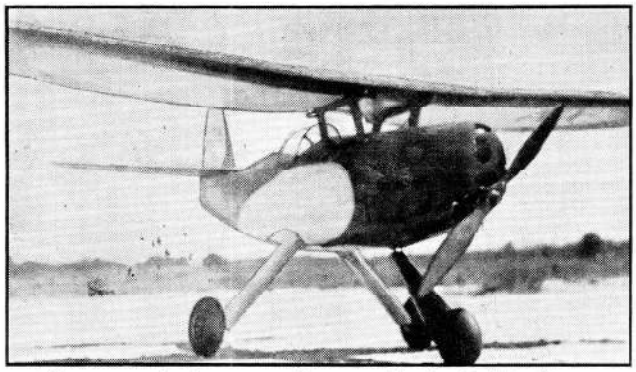
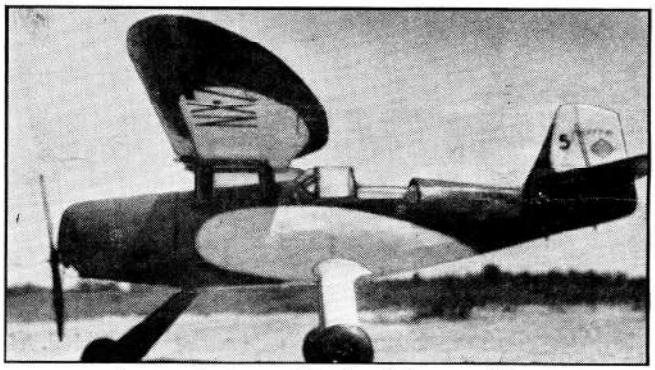

TRUE LENGTH - 8 5/8"
PLAN VIEW
SECTION A-A HALF SIZE.
SECTION B-B HALF SIZE.
DRILL 5 HOLES - 3/32"
RIB 1
RIB 2
RIB 3
RIB 4
RIB 5
RUDDER RIBS.
5/32" X 1/16" BAMBOO
PAPER
CELLULOID.
SECTION C-C FULL SIZE.
UPPER AND LOWER ENDS OF FRONT LANDING GEAR LEG.
1/8" I.D. TUBE
STATION 1
STATION 2
STATION 3
STATION 4
STATION 5
STATION 6
STATION 7
STATION 9
STATION 10
STATION 8
FORMER 6A
EACH SQ. = 1/2" SQ. ON FULL SIZE PLANS.
2° INCIDENCE.
LENGTH OVERALL 46 1/2"
BOOSTER PLUGS RIGHT SIDE
REAR FACE OF PROPELLER HUB
℄ OF ENGINE.
SIDE ELEVATION.
3/32" SQ. STRINGERS.
REAR WHEELS 4 1/2" DIAM.
FRONT WHEEL 3 1/2" DIAM.
ENGINE COWLING NO SCALE.
NEG.
POS.
BATTERIES SCALE - 3/8" = 1"
DRILL - 3/32"
UPPER & LOWER ENDS OF REAR LEFT LANDING GEAR LEG. 3/8" = 1"
DRILL - 1/8"
TRIPED
FUSELAGE, LANDING GEAR & RUDDER ASSEMBLY
DRAFTSMAN P.M. Matthews 6-30-38
SHEET ONE
SCALE - 3/16" = 1" EXCEPT WHERE SPECIFIED.



The nose wheel protects the propeller in bad landings



A pursuit type with fine flying qualities

A THREE WHEELING GAS MODEL

Complete Data From Which You Can Build An Up To Date Gas Model That Gives Thrilling Performance

By PETER W. WESTBURG

THIS gas model was designed primarily as an experiment to test the adaptability of a tricycle landing gear to a gas model. Except for this innovation, the model is quite orthodox in construction and closely follows the methods which we have so far successfully used in previous models.

You will experience a new thrill watching the landings of this model. In the conventional model, too steep a glide very often leads to a very badly damaged nose or engine and usually a broken propeller. In this three-wheeler, the front landing gear wheel protects the propeller, engine and nose of the plane and as a result there is very little or no damage to the plane in landing.

If the rear landing gear legs are moved from 1-1/2 inches to 2 inches farther forward than is shown in the plans, you will get better and quicker take-offs. This is a matter of choice. If you decide to move the landing gear legs forward, a few minor changes will be necessary in the size and location of Bulkhead No. 6 and the uprights, diagonals and crosspieces adjacent to it.

Originally powered by a Baby Cyclone, the model performed well enough, but later a Brown Jr. was installed which considerably increased the performance. With the Brown Jr. we had better takeoffs and a higher rate of climb.

While this model has a rather high wing loading, it is a very stable flyer and also quite fast.

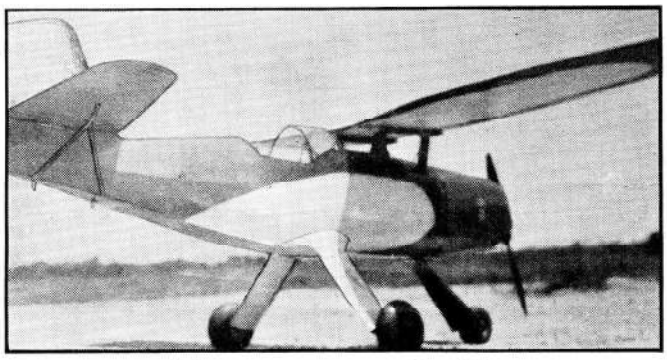
In making this model, follow the plans closely and do not deviate unnecessarily from them. Pay especial attention to the construction and alignment of the cabane struts and the front wheel.

Since the fin and rudder is the easiest single unit to make, we will begin construction with them. The leading edge of the fin is 3/8″ by 1/4″. Make the triangle consisting of the leading edge, the rudder post, and bottom rib (5) and insert all the other ribs which are of 1/16″ thick balsa. Both rudder posts are 3/8″ by 1/4″ balsa and are broken at the point where rib (2) intersects them. Make the rudder in the same way and cut the slots for the 1/8″ by 1″ brass strip hinges which are glued to the rudder ribs (2) and (4).

The tin fitting is cut from a blank 1/4″ by 1-3/8″ and two small holes are drilled in the tips for the tail wires which are of No. 24 tinned wire.

If you care to, glue small triangular blocks in each corner of the fin and rudder and sand to a curve as shown. These eliminate wrinkles when covering, but are not absolutely necessary.

Make the upper fitting for the stabilizer adjustment mechanism first. It is simply a (T) made by soldering a stem of 1/8″ O.D. brass tubing 5/8″ long to a bar of tubing which is 7/8″ long. The stem is drilled with a No. 50 drill, then tapped with a 2-56 N.C.-3 tap. The bar is drilled 3/32″ to receive a 3/32″ rod. The whole is bound and cemented to the spar. A shallow notch is cut out of the spar to allow free movement. A similar fitting is made for the front shaft and is bound and glued to the front piece which forms part of the leading edge of the stabilizer.



The parasol wing is adjustable

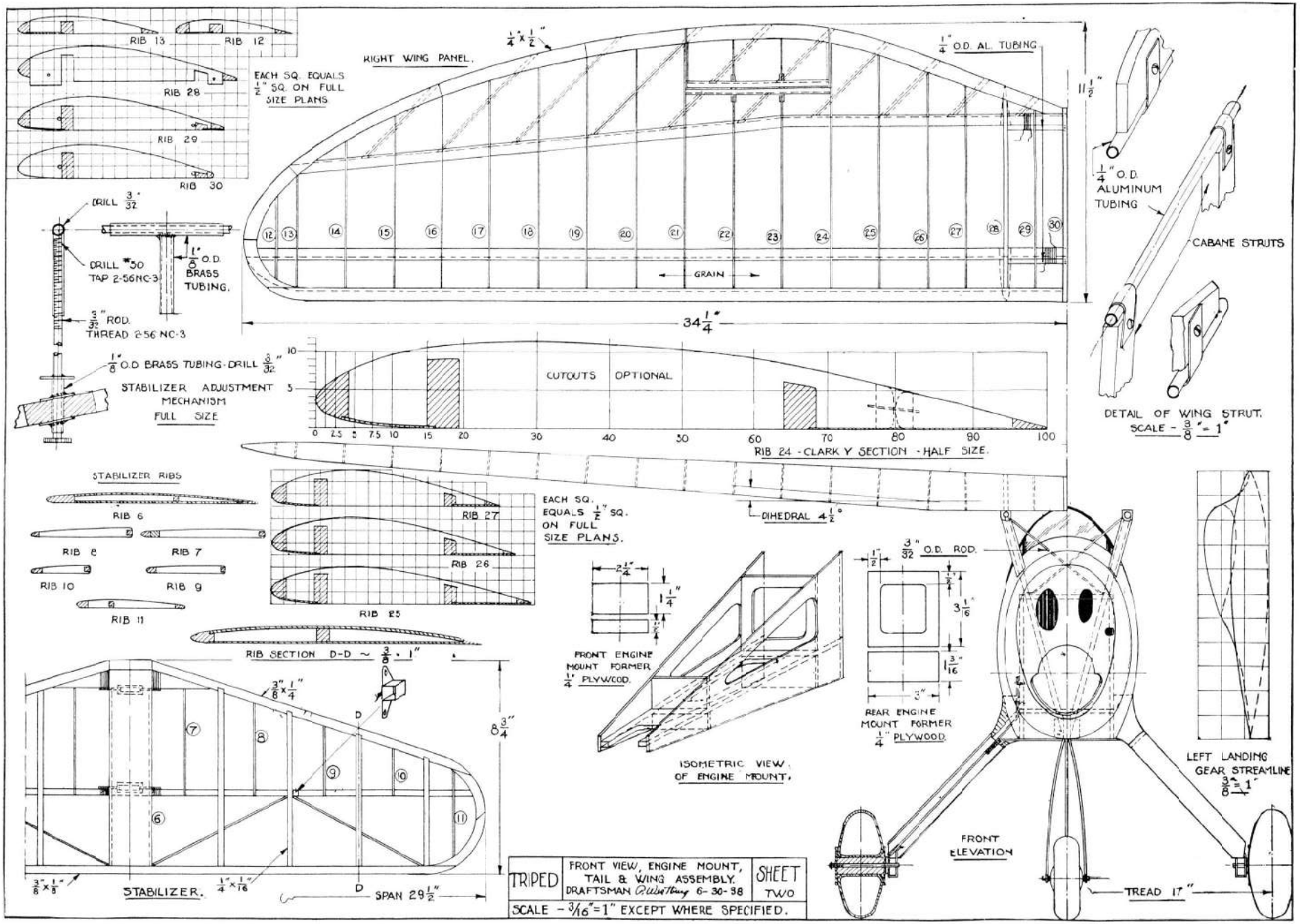
Assemble ribs (7), (8), (9), (10) and (11) on the spar which is 1/4″ square and glue on the leading edges. Remember to cut out notches on upper and lower sides of the leading edges for the 1/4″ by 1/16″ strips which form the main ribs. Cement these on and, when dry, put on the trailing edge and tips. At this point, put in the front piece with the fitting bound to it and the center piece of the trailing edge. Ribs (6) are next put in, the top and bottom surfaces between these ribs being covered with 1/32″ balsa. The bottom surfaces must have two rectangular holes cut out for the fittings. The inner braces are 3/32″ square. Go over all the joints with glue and, when dry, trim off the edges. Put on the tail wire fittings, which are like the tail wire fitting on the rudder, and wire well.

The wing in construction and shape very closely resembles the pursuit type gas model wing which proved so effective and which some of you have perhaps made. It can be made in two panels as shown in the plans, or as a straight wing. The former method is the better since it allows easier handling and there is less possibility of the wing breaking in a bad landing. If you choose the latter method, you will probably have to splice your spars. Only one center rib is necessary then and it can be made of 1/16″ balsa.

Ribs (14) to (24) inclusive are all of the familiar Clark Y wing section which we firmly believe to be the best for gas models. The table of ordinates is given at the end of the article.

Ribs (12), (13), and (25) to (30) inclusive have all been presented on the graph and are very similar to the others. Butt rib (30) is 3/16″ thick and rib (28) is 1/4″ thick; all others are 1/16″ thick. Make all the ribs first; and after binding to the spars the 1/4″ O.D. aluminum tubing which receives the lateral shear pins, assemble all but rib (28) on the spars. The front spar is 1/2″ thick and varies in height from 1-1/16″ to 5/16″. The rear spar is also 1/2″ thick and varies in height from 3/4″ to 1/8″, where it joins the trailing edge. It is broken where rib (24) intersects it and in cross section is trapezoidal to conform with the curve of the ribs. When

(Continued on page 34)


RIB 13
RIB 12
RIB 28
RIB 29
RIB 30
EACH SQ. EQUALS ½" SQ. ON FULL SIZE PLANS
RIGHT WING PANEL.
¼ x ½"
¼" O.D. AL. TUBING
11½"
34¼"
GRAIN
DRILL 3/32"
DRILL #30 TAP 2-56NC-3
⅛" O.D. BRASS TUBING.
3/32" ROD. THREAD 2-56 NC-3
⅛" O.D BRASS TUBING - DRILL 3/32"
STABILIZER ADJUSTMENT MECHANISM FULL SIZE
CUTOUTS OPTIONAL
RIB 24 - CLARK Y SECTION - HALF SIZE.
DIHEDRAL 4½°
¼" O.D. ALUMINUM TUBING
CABANE STRUTS
DETAIL OF WING STRUT. SCALE - ⅜" = 1"
STABILIZER RIBS
RIB 6
RIB 8
RIB 7
RIB 10
RIB 9
RIB 11
RIB 27
RIB 26
RIB 25
EACH SQ. EQUALS ½" SQ. ON FULL SIZE PLANS.
RIB SECTION D-D ~ ⅜" = 1"
FRONT ENGINE MOUNT FORMER ¼" PLYWOOD.
ISOMETRIC VIEW OF ENGINE MOUNT.
3/32" O.D. ROD.
REAR ENGINE MOUNT FORMER ¼" PLYWOOD.
LEFT LANDING GEAR STREAMLINE ⅜" = 1"
FRONT ELEVATION
TREAD 17"
8¾"
SPAN 29½"
STABILIZER.
TRIPED
FRONT VIEW, ENGINE MOUNT, TAIL & WING ASSEMBLY.
DRAFTSMAN Walter Young 6-30-38
SHEET TWO
SCALE - 3/16" = 1" EXCEPT WHERE SPECIFIED.

Building the Midget Speedster

(Continued from page 7)

ground. Correction for climb or dive is made by warping the elevators slightly. Torque can be cured thus: Looking at the model from the rear, warp the trailing edge of the left elevator *down* slightly and the right elevator *up* slightly. This is more effective than rudder adjustments as the model tends to roll rather than turn from the torque.

After adjusting, try a few snappy take-offs, winder wound. Then watch the air hum.

A Three Wheeling Gas Model

(Continued from page 11)

assembling be sure that the bottom of the ribs is flush with the bottom of the spars. Note also that in the lower front corner of the front spar and the lower rear corner of the rear spar a shallow groove 1/8" by 1/32" is cut and extends the full length of the spars. The leading edge is 1/2" wide and is put on now. It has the same shallow groove cut into it to receive the 1/32" sheet balsa which covers the bottom of the wing between the leading edge and the front spar, and the rear spar and the trailing edge. However, do not put this on until the strut fittings have been built in. Drill two holes in rib (28) where shown and cut four lengths of 1/4" O.D. aluminum tubing. Tin these with aluminum solder. The straps are brass sheet 1/2" by 1-3/4" and after the insides are tinned, bend and solder these to the tubing. These in turn, are bolted to rib (28) with 2-56 roundhead machine screws. To take this size screw, drill a 3/32" hole. Put these ribs on the wing and glue on the trailing edges and the tip outlines. Note that the rear bottom surface is covered diagonally. One-sixty-fourth inch flat strips are glued over the cracks. Although this is not necessary, it improves the appearance. Cover the front and bottom surfaces and trim off the outlines.

The construction of the trimming tab is quite clearly shown. The same type of strip hinges are used as were used on the rudder.

To streamline the strut fittings, glue to both sides and the bottom of the tubing, 1/8" thick pieces of balsa. Sand these to a streamline shape and finish with plastic wood. Plug the rear fitting so that the shear pins will not come out. Drill two small holes vertically through the butt ribs and tubing to take wire staples which keep the wing panels from separating. Check the wing for any weak joints.

In making the fuselage, follow the conventional method of construction by first laying out the longerons, uprights and diagonals of one side on a pattern. The only stations which have no uprights are stations (8) and (10). No upper crosspieces are used at stations (5) and (10). A crosspiece is necessary at the lower end of former (6a). The uprights and crosspieces at station (6) are 3/16" by 1-1/4" white pine. All the longerons, crosspieces, uprights and diagonals in front of station (6) are 3/16" square white pine. All crosspieces, diagonals and uprights to the rear of station (6) are of 3/16" square hard balsa. While the sides are drying make the firewall, bulkheads and formers. The firewall is 1/4" thick aircraft plywood. The formers at station (4) are 1/4" thick and should be cut out for lightness. Medium balsa may be used. The bulkhead at station (5) is made of 1/4" thick hard balsa. A vertical slot is cut out as shown to receive the fuselage sides. At station (6) the bulkhead is 1/4" thick aircraft plywood. The remaining formers are all cut out of 1/8" thick, flat, hard balsa. Make sure that all holes necessary for ignition wires, landing gear, etcetera are cut or drilled in as required.

Assemble the fuselage by slipping the sides into the slots in bulkhead (5) and the square holes cut in the firewall for the longerons. Next, put in bulkhead (6) and glue securely; using 1/2" brads for extra strength. Put in all the rest of the crosspieces and the lower rudder post, which is 1/4" thick hard balsa. Use 1/2" brads at all corners.

The top of the fuselage between stations (7) and (9) is covered with 1/32" hard sheet balsa and between (9) and (10) two 1/8" flat pieces of balsa form the sides of the fuselage on which the tail surfaces rest. The area between these and just to the rear of station (9) is filled in with scraps of balsa. At this time the tail block can be glued on and sanded down to conform to the shape of the fuselage. Cut away the top of the fuselage sides between stations (9) and (10) to allow for some movement of the stabilizer. The high point must be immediately beneath the spar of the stabilizer and serves as a pivot point or fulcrum.

Leave this portion of the fuselage temporarily and return to the front part. The hardwood piece between the firewall and station (5) is 1/4" thick and tapers in side view from 3/4" to 1/4". Glue it in securely. The dashboard is made from 1/8" flat balsa. The wood part of the cockpit is built up from 1/8" by 3/8" pieces of soft balsa. A stringer is necessary between station (4)

and former (6a) to keep the stiff paper cowling from sagging. There are also five similar stringers between the firewall and station (5). These are all 3/32" square. The booster plugs are mounted on a piece 1/8" by 1/2" on the right side in the position shown in the plans.

The battery slide and runner come next. The slide, to which the batteries are cemented, is 1/8" by 1-3/4" by 2-1/2" and slides in a runner, the overall width of which is two inches. The runner is made by gluing two 1/8" square strips to the base. On these are glued two strips 1/4" by 1/8". The runner fits snugly against bulkhead (5) and goes as far back as station (7). This provides ample room for fixing the center of gravity.

The landing gear is made of .094 piano wire and sheet brass. To make the rear landing gear make four pieces which constitute the main members. The true length and shape of these is shown in the front view. Solder these first to the upper fittings which are 1" by 1-5/8" sheet brass. The lower piece is bent as shown from a piece 1" by 3-1/4". Solder this well to the piano-wire legs and drill a 1/8" hole where shown. An auxiliary piece in the shape of an elongated "S" is soldered between these legs. Both sides are connected by two pieces of piano wire which, when the landing gear is put on the plane, fit up against the bottom of the fuselage. All joints are bound with tinned wire and soldered well. Drill two holes through each of the upper landing gear ends with a No. 33 drill and bolt to the uprights at station (6) with 4-40 roundhead machine screws. Coat this well with cement. The axle is of 1/8" O.D. brass tubing and long enough to extend about a sixteenth of an inch or so outside of the wheel hub. Solder this to the lower fitting. Drill the outer end with a No. (50) drill and tap 2-56 N.C.-3 by 3/8". The wheel is held on with a washer and 2-56 screw.

When making the front landing gear leg, make the U-piece first. To this, solder the trapezoid-shaped ends which hold the axle bearings. The other members can now be soldered on, as well as the upper fitting which it cut and bent from a blank of sheet brass 1-3/8" by 1-7/8". Six 3/32" holes are drilled in this fitting and four 2-56 screws are used to bolt the leg to the bulkhead and the tapered piece already described. The bearings are two pieces of 1/8" I.D. copper tubing, 3/8" long. The axle is a length of 1/8" O.D. brass tubing, both ends of which are drilled and tapped the same as the axles of the rear landing legs. Take pains in lining up this and roll the fuselage across the floor several times to check the alignment of the wheels. This is important if you don't want the plane to ground-loop.

The fillets or streamlines for the rear landing gear legs are carved from medium balsa. The side and top view are shown on the graph to give you exact dimensions. Before putting on the streamlines it is necessary to cut notches on the inner sides where they fit over the landing gear legs. After they are on the plane, glue these pieces back in and fill the resulting hole with plastic wood to strengthen this part of the landing gear. Sand them carefully, being sure not to get them undersize.

We are ready now to install the wing struts, which are basswood, 1/2" by 1/4". The front ones are ten inches long; the rear ones must be cut to fit when the angle of incidence is built in. Locate the place on the longerons where the struts intersect them and nail them at this point and at their lower ends with 1/2" brads. Glue securely. To make the struts more rigid, the space between the firewall and station (5) and between the longerons is filled in with 3/16" thick white pine or hard balsa. Cut two pieces of 1/4" O.D. aluminum tubing and tin the ends. Four straps are made of sheet brass just as they were for the wing fittings. Bolt these on with 2-56 screws. Bolt the front ends first and check the dimension between the tubes. This should be about 1/16" shorter than the distance between the tubes on the wing so that when the wing is put on, you have a snug fit. Determine the angle of incidence and cut the rear struts to the correct length. After this has been done, make four 3/32" welding rod braces. The lower ends of these are flattened, drilled and screwed to the white pine pieces between the longerons. The upper ends are soldered to the straps. Go over all joints well with cement. Streamline the exterior parts of the struts as shown, with soft balsa, using plastic wood to fill in the cracks.

The "juice" is furnished by four penlight batteries which, in pairs, are connected as shown. Wrap a piece of adhesive tape around them and cement firmly to the slide. The toggle switch is mounted on a seat 3/16" by 1" which is glued between the longerons just before station (7). Put in your ignition wires, making sure that all connections are soldered well.

The 1/2" by 1/2" by 5-1/8" dural angles are bolted to the firewall with three 4-40 screws in each. Note that where the lower screw is shown a slot is cut in the angle.

In a crack-up, this allows the mount to swing upward, and thus may save the trouble of making a new motor mount.

At this stage in the construction, we are ready to put on part of the stiff paper cowling. This paper is the type commonly used in filing cabinets for folders. Use paper cement which can be obtained at any stationers; do not use gas model cement as it will cause the paper to wrinkle. Beginning with that portion between the struts, cover all the fuselage on the top from the firewall to the dashboard. On the sides, cover from the firewall to station (6). The area between station (6) and former (6a) is not covered until the silk has been put on the rear portion of the fuselage. It is a good idea to leave the section adjacent to the booster plugs open until you have checked the ignition. The bottom is covered from the firewall to the crosspiece at former (6a).

The rear part of the fuselage is finished now by putting on the 3/32" square stringers and 1/8" square trasverse diagonals.

The shaft and sleeve parts of the stabilizer adjustment mechanism are assembled on crosspieces 1" by 3/16" white pine. The sleeves are two pieces of brass tubing 1/8" O.D. by 5/8", to which are soldered the washers. These are at angle to coincide with the slant of the longerons. The lower washers are soldered on after the sleeves have been inserted in the crosspieces. The shafts are 3/32" O.D. rod by approximately 4-1/4" long for the front one and 3-3/4" for the rear. All other information is given on the plans. When finished cement and nail in the assembly with 1/2" brads.

The lower wire fittings are not put on until after the fuselage has been covered; four 3/8" wood screws are used to fasten them to the longerons.

Most of the information necessary to make the cockpit cover is conveyed in the plans. A bamboo framework is cemented on and inside this a cut-out section of paper is glued. The celluloid is cemented to this. Use thin celluloid and you will have no trouble.

The fairings on the landing gear are much simpler than they seem. They are also made of stiff paper. A strip of paper 1/4" wide is used to hold the edges together; paper cement being used throughout. The front fairing is simply held on by the screws which keep the front axle from sliding out. The rear ones are made by fitting the paper around the streamline and leg before the final cementing. Around the outer edge of the streamline cut a 1/32" by 1/4" groove and slip the fairing over the leg. Cement it to the streamline. In landings the fairing will buckle and wrinkle a little, but not enough to seriously injure the appearance of the plane.

The engine mount is made entirely of aircraft plywood. The sides are 1/8" thick and the formers and centerpiece are all 1/4" thick. Cut all the parts accurately, and do not forget a hole for the coil which is fastened with a clip to the firewall. Assemble all the parts with brads, glue and give them a couple coats of dope.

Install the coil, condenser and gas tank where indicated. You may use any engine with the conventional mounting lugs. Since every make of engine varies a little in dimensions, we have shown where the rear face of the propeller must be. Drill your holes in the proper places and line up your engine carefully. There is no off-set or change in the thrust angle necessary.

The engine cowling is made in two parts: The cowling which fits over the engine proper and the skirt. The skirt is a framework consisting of two 1/8" plywood formers and four 1/8" by 1/4" stringers. The rear former has four holes cut in it to receive the four triangular blocks of pine which are glued and screwed to the firewall. On the inside of the cowling and just in front of the rear former, four tabs 1/8" by 1/2" by 3/4" are glued. The 3/8" wood screws which hold the skirt pass through these into the blocks. The framework is also covered with stiff paper. The front cowling is made of medium balsa blocks which are glued together with the grain running as shown. You can make this right on the skirt, cutting it off when finished. This cowling fastens to the skirt in the same way that the skirt fastens to the firewall, except that only three blocks are necessary. Cut out the cooling holes and exhaust hole.

Covering and assembling the model is your next step. Use silk on the wing, tail surfaces and fuselage. Two coats of dope will be necessary to tighten it.

The color scheme and design is a matter of choice and personal preference. We used two coats of green and white brushing lacquer which served very well. Before painting, give all paper and wood surfaces a coat of dope.

Assemble the wing panels and put them on the fuselage. Remember that these must fit accurately and tightly together. The fin and rudder can now be attached to the stabilizer by cementing them on firmly. Put the tail surfaces on the fuselage and with the stabilizer set at zero degrees rig the tail. Use 1/2" turnbuckles and do not forget to wire them so that they will not vibrate loose. To change the angle of incidence, simply loosen the turnblackles and turn the shafts until you have the desired angle. The plane flies best at a

setting of about half to negative one degree.

Slide the batteries forward or backward to fix the center of gravity and your work is finished.

Table Of Clark Ordinates

Pct.	*Upper*	*Lower*
0.00	3.50	3.50
1.25	5.45	1.93
2.50	6.50	1.47
5.00	7.90	.93
7.50	8.85	.63
10.00	9.60	.42
15.00	10.69	.15
20.00	11.36	.03
30.00	11.70	.00
40.00	11.40	.00
50.00	10.52	.00
60.00	9.15	.00
70.00	7.35	.00
80.00	5.22	.00
90.00	2.80	.00
100.00	.12	.00

Specifications

Span	68-1/2"
Chord	11-1/2"
Length Overall	46-1/2"
Height Overall	21-7/8"
Tread	17"
Wheel Base	17-1/2"
Tail Span	29-1/2"
Tail Chord	8-3/4"
Wing Area	661.77 sq. in.
Fin Area	73.53 sq. in.
Stabilizer Area	193.4 sq. in.
Weight (Total)	4 lbs. 10 oz.
Wing Loading	1.019 lbs. per sq. in.
Power Loading—	
Cyclone	28.5 lbs. per h.p.
Brown Jr.	23..75 lbs. per h.p.

Now They Live to Fly Again

(Continued from page 5)

The parachute opened nicely, but only to lower Irvin so fast, that the impact broke his ankle when a sudden gust of wind hit him. The Parachute Board was overjoyed; the success of the jump was proof of their arguments. Being put to a practical test, the 'chute had come out with flying colors.

After a bit more experimentation, the Board came out with their first official parachute, known as Type "A." This parachute consisted of a silken canopy folded into a rather bulky back-pack. It had forty silk lines, and was made of straight cut Japanese type Habutae silk. The canopy was equipped with a forty-eight inch flexible vent at the top. The purpose of the vent was to ease the opening shock and to combat oscillation by permitting a flow of air to escape at the top of the parachute.

Due to its bulky nature, it met with little approval from fliers. Many fliers at that time would rather chance a fall with a plane than resort to jumping. They were also afraid of being called cowards for carrying 'chutes, a fact which hurt their ego. Thus the Parachute Board was faced with additional opposition.

Soon after the development of Air Service Parachute Type "A," a new design was evolved. Known as the "multiple vent" type, this parachute had a series of vents used in hope of getting better inherent operating qualities. However, when a little trouble was experienced in getting steady and satisfactory openings, they were remodeled by eliminating most of the vents.

The next development was the seat pack, and the putting of the remodeled Multiple Vent 'chutes into these seat containers. The Parachute Board scored a great moral victory, when on October 20, 1920, Lieut. Harris was saved from death by using one of the remodeled seat parachutes when his plane became disabled.

The crowning achievement of the Board was the Type S parachute. This Type S parachute design is still used, and is the combination of the many ideas of the different men of the Parachute Board.

The 'chute was twenty-four feet in diameter, and had its panels cut on the bias, as this method made for greater strength and more economical construction. Twenty-four lines of braided silk