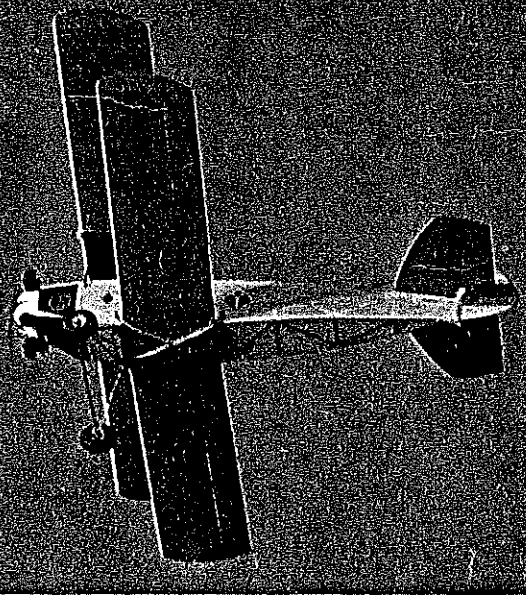
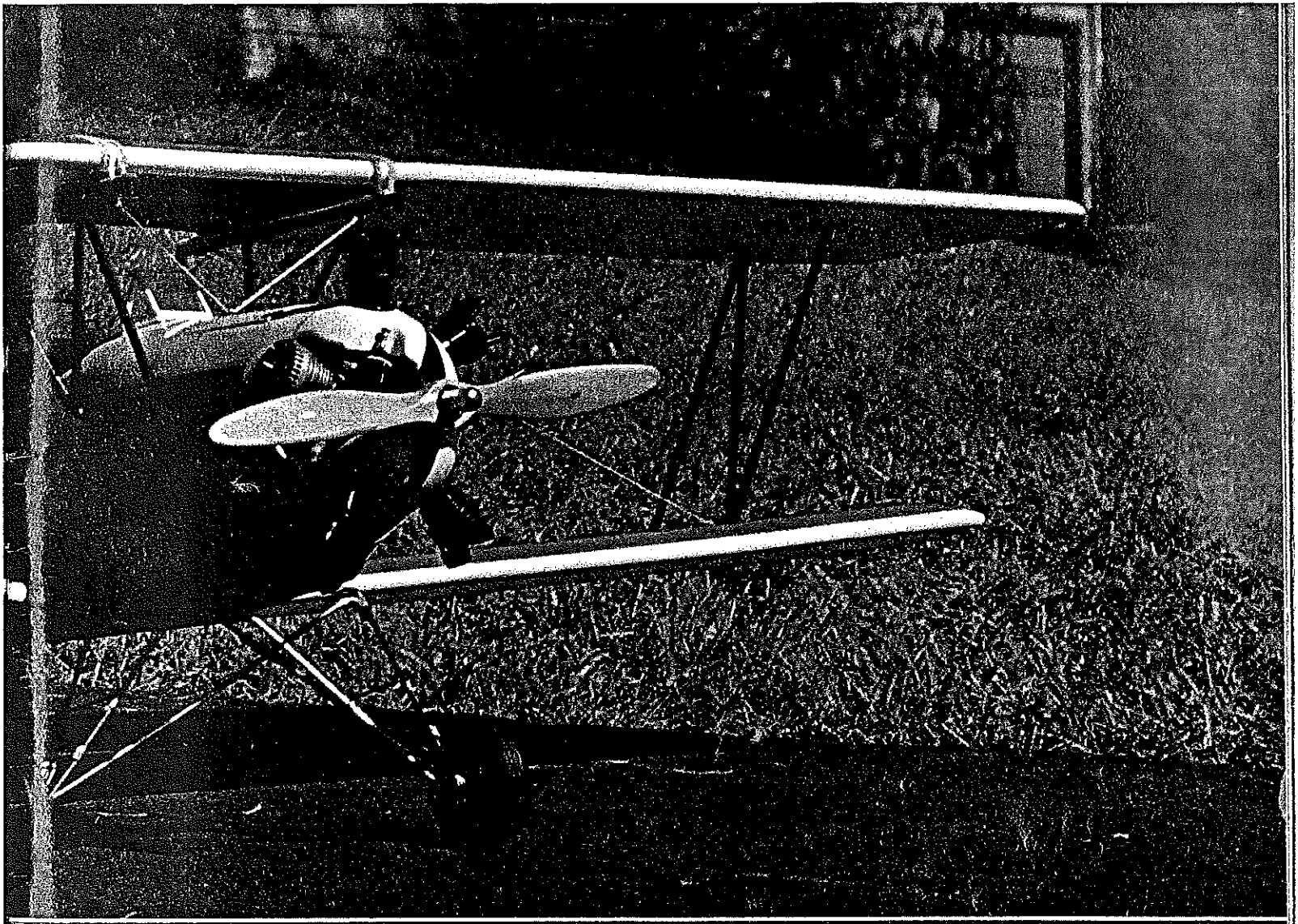
The tilted engine mounting—not quite side-mounted—blends perfectly with the dummy radial, it being one of the cylinders. The author describes aircraft as a "big stick" job since the only blocks and sheeting are forward on the wing center sections and fuselage nose.

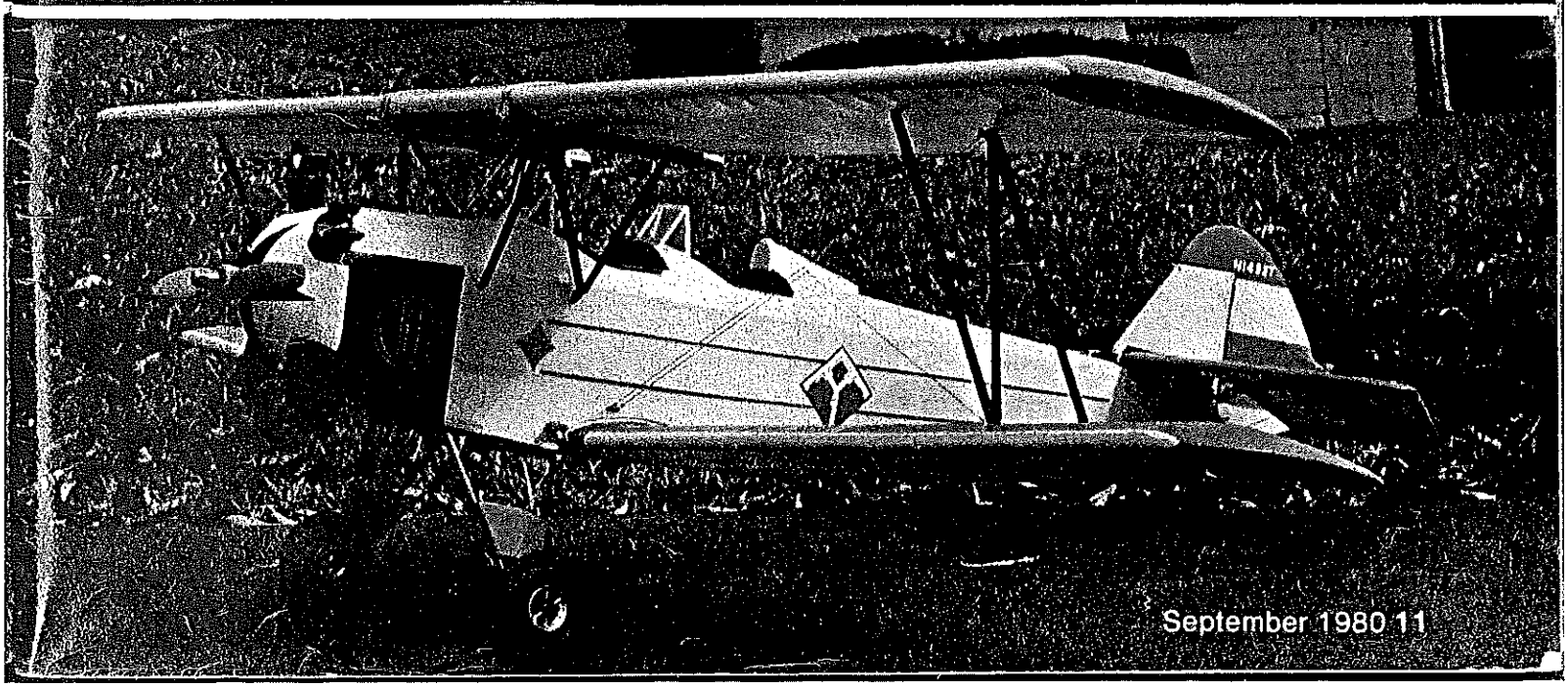
The 1930 FLEET

Reuben Fleet would have loved this! In spite of mostly straight lines it is thing of beauty—proportions probably do it. Identical top and bottom wings, straight fuselage sides and no complicated curves make it relatively easy to build. Like biggies? Concept has ¼ scaler.

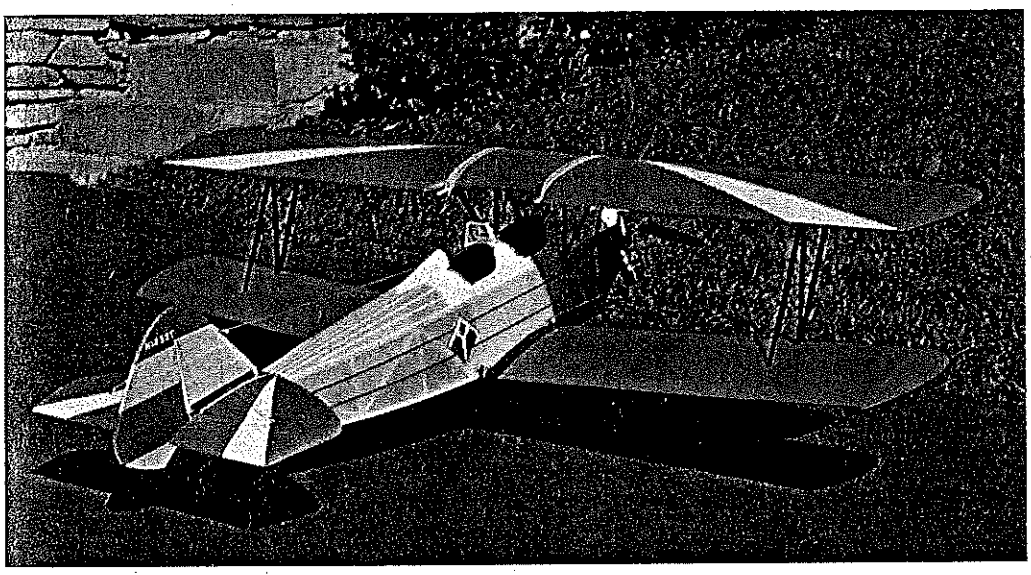




For .35/.40 power, this 56-in. classic weighs only five pounds, for a loading of 13.4 oz. per sq. ft. A big plus is the adjustable stabilizer—which could be operated by a fifth servo. ● Gary E. Brown



No, the plane isn't that big—it spans 56 in. It's just that the lovely young lady wanted her picture taken, smile and all, and to hold the ship so its simple but nice color scheme shows up.



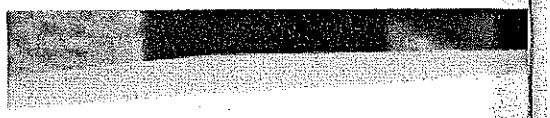
You can always tell a Fleet—most of them anyway, because there were some early Army primary trainers—by that characteristic rudder with so much area down around the fuselage center line.

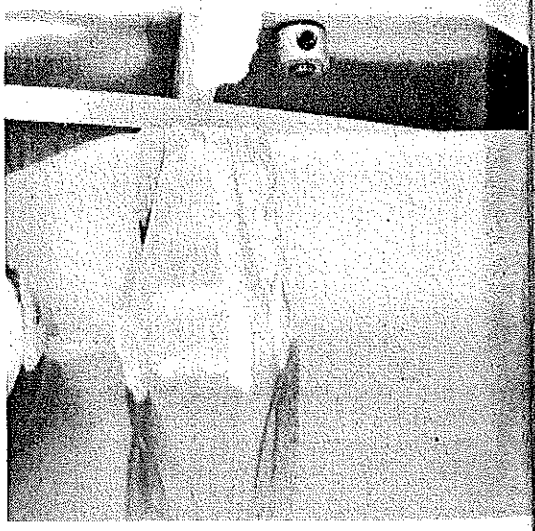
What we all love to see—a classic biplane, tail just up, rolling faster and faster on really smooth grass. With 840 sq. in. of wing area, the wing loading is a polite 13.4 oz./sq./ft.

THIS project began to evolve several years ago while attending a fun-fly held at a quiet little country airport here in central New York. Having lots of time between events, I wandered up and down the two rows of open hangars carefully examining each of the full-size aircraft. What interesting aircraft they were! There were two English Tiger Moths, two immaculate J-3s, a red and white Porterfield, two tiny low-wing home-built racers and way down at the end, a restored orange and white 1930 Fleet.

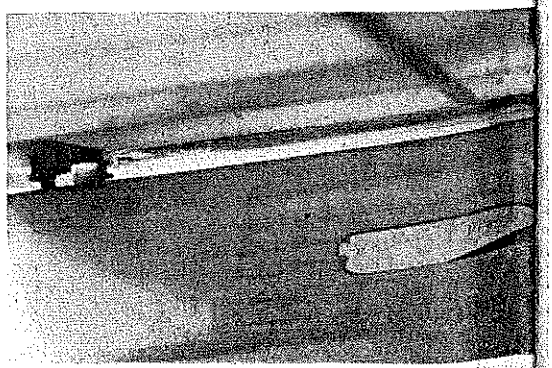
Almost immediately I began to consider the Fleet for an RC sport scale project. It looked relatively easy. It had identical top and bottom wings, straight fuselage sides, and no complicated curves. Soon I began to form my design specifications. First of all, I wanted it to be of medium to large size for smooth and easy handling. Secondly, I wanted it light for low wing loading for scale-like flight. Thirdly, I wanted to use an engine in the .35 to .40 range for fuel economy, as I did not care to pay for all the fuel a .60 can guzzle. As it turns out, a .60 is entirely unnecessary for this design. The model is not intended to fly like the Pitts and Pulsars!

A scale of two inches to one foot was decided upon which yielded a nice, neat 56-in. wing span. The wing area figured out to 860 sq. in. With a ready-to-fly weight of five pounds, wing loading figured out to 13.4 oz./sq. ft. of wing area. This factor contributed greatly to its easy flying characteristics and ability to use less engine than one

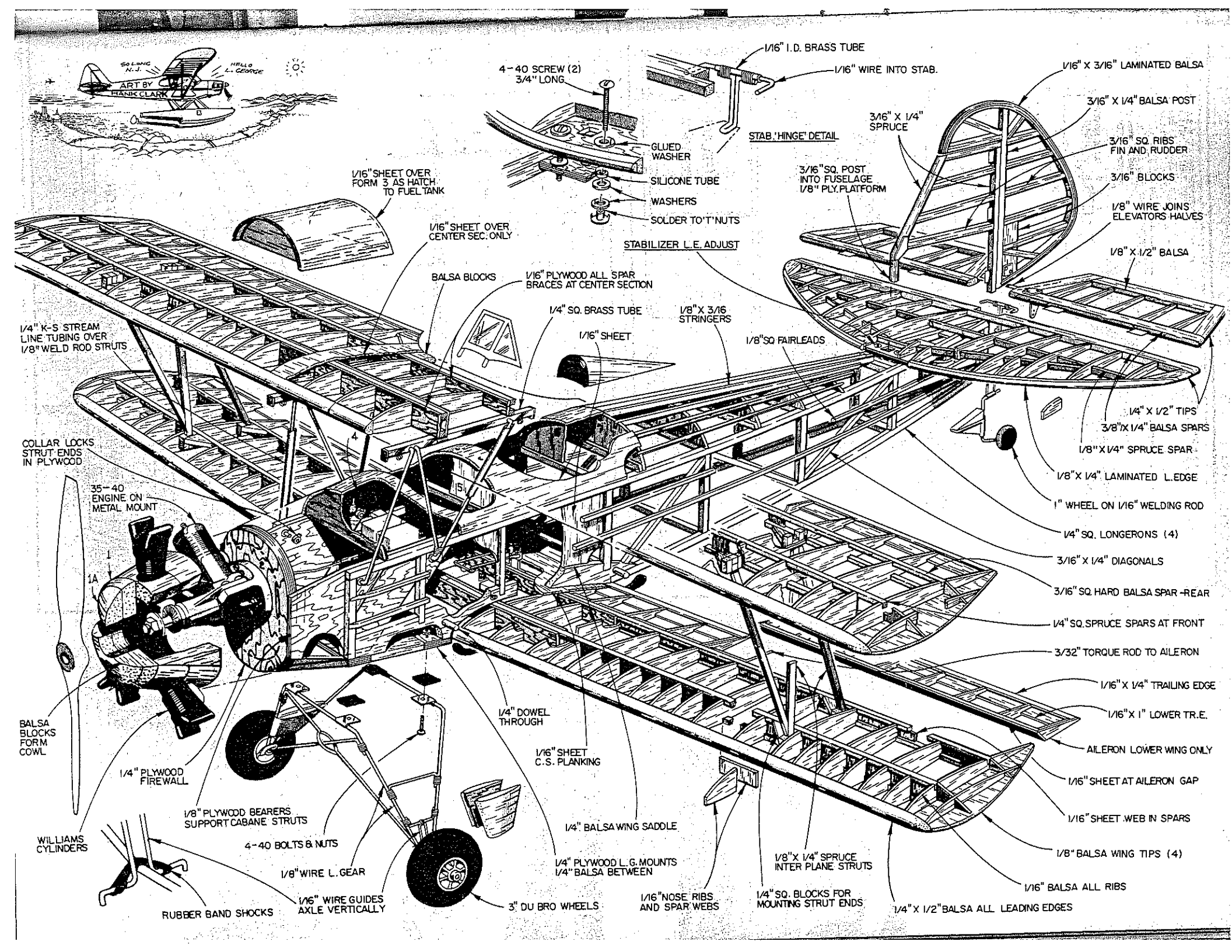




The 8 oz. slant tank gives plenty of capacity for long flights. Here, rubberband hold-downs pass in front and in back of bubble on top.



Stabilizer is adjustable near its leading edge. Could be controlled by another servo if you wish to go first class. Elevator pushrod, right.

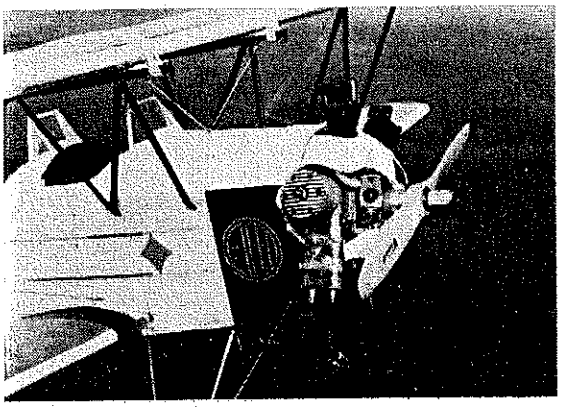

SO LONG N.J.
HELLO L. GEORGE
ART BY HANK CLARK
1/16" I.D. BRASS TUBE
1/16" WIRE INTO STAB.
4-40 SCREW (2) 3/4" LONG
STAB. 'HINGE' DETAIL
GLUED WASHER
SILICONE TUBE
WASHERS
SOLDER TO 'T' NUTS
1/16" SHEET OVER FORM 3 AS HATCH TO FUEL TANK
1/16" SHEET OVER CENTER SEC. ONLY
STABILIZER L.E. ADJUST
BALSA BLOCKS
1/16" PLYWOOD ALL SPAR BRACES AT CENTER SECTION
1/4" SQ. BRASS TUBE
1/8" X 3/16 STRINGERS
1/16" SHEET
1/8" SQ FAIRLEADS
1/4" K-S STREAM LINE TUBING OVER 1/8" WELD ROD STRUTS
COLLAR LOCKS STRUT ENDS IN PLYWOOD
35-40 ENGINE ON METAL MOUNT
1/4" PLYWOOD FIREWALL
BALSA BLOCKS FORM COWL
1/8" PLYWOOD BEARERS SUPPORT CABANE STRUTS
WILLIAMS CYLINDERS
4-40 BOLTS & NUTS
1/8" WIRE L. GEAR
RUBBER BAND SHOCKS
1/16" WIRE GUIDES AXLE VERTICALLY
3" DU BRO WHEELS
1/4" DOWEL THROUGH
1/16" SHEET C.S. PLANKING
1/4" BALSA WING SADDLE
1/4" PLYWOOD L.G. MOUNTS 1/4" BALSA BETWEEN
1/16" NOSE RIBS AND SPAR WEBS
1/4" SQ. BLOCKS FOR MOUNTING STRUT ENDS
1/8" X 1/4" SPRUCE INTER PLANE STRUTS
1/4" X 1/2" BALSA ALL LEADING EDGES
1/16" BALSA ALL RIBS
1/8" BALSA WING TIPS (4)
1/16" SHEET WEB IN SPARS
1/16" SHEET AT AILERON GAP
AILERON LOWER WING ONLY
1/16" X 1" LOWER TR.E.
1/16" X 1/4" TRAILING EDGE
3/32" TORQUE ROD TO AILERON
1/4" SQ. SPRUCE SPARS AT FRONT
3/16" SQ. HARD BALSA SPAR -REAR
3/16" X 1/4" DIAGONALS
1/4" SQ. LONGERONS (4)
1" WHEEL ON 1/16" WELDING ROD
1/8" X 1/4" LAMINATED L.EDGE
1/8" X 1/4" SPRUCE SPAR
3/8" X 1/4" BALSA SPARS
1/4" X 1/2" TIPS
1/8" X 1/2" BALSA
1/8" WIRE JOINS ELEVATORS HALVES
3/16" BLOCKS
3/16" SQ. RIBS FIN AND RUDDER
3/16" X 1/4" SPRUCE
3/16" SQ. POST INTO FUSELAGE 1/8" PLY. PLATFORM
3/16" X 1/4" BALSA POST
1/16" X 3/16" LAMINATED BALSA

would normally expect on a model of this size.

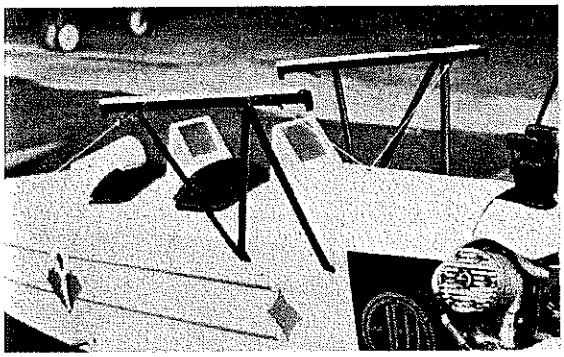
Takeoffs are short and graceful, with the airfoil stab lifting the tail quickly. In the air the model can be flown very slowly in a scale-like manner without fear of stalling. Being a light biplane with lots of drag, it will slow down quickly. On one occasion, I idled back too soon and the model landed just short of the field in a "stretched" glide. Although the ailerons became less effective at low speed, rudder control remained good and the model never tended to drop a wing tip.

To describe the construction, you might say it is just a big "stick job." The only sheeting and solid surfaces are in the forward fuselage and wing center sections. All other components are built up for lightness as well as strength. Both wings are built over the same plan. They are identical except for ailerons on the lower wing only and their respective center sections. The stabilizer has been designed so its incidence can

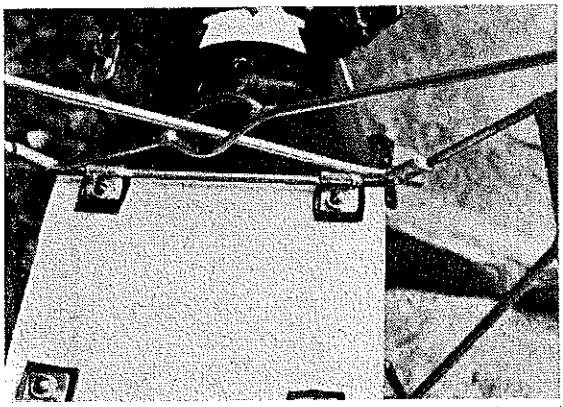
Continued on page 103



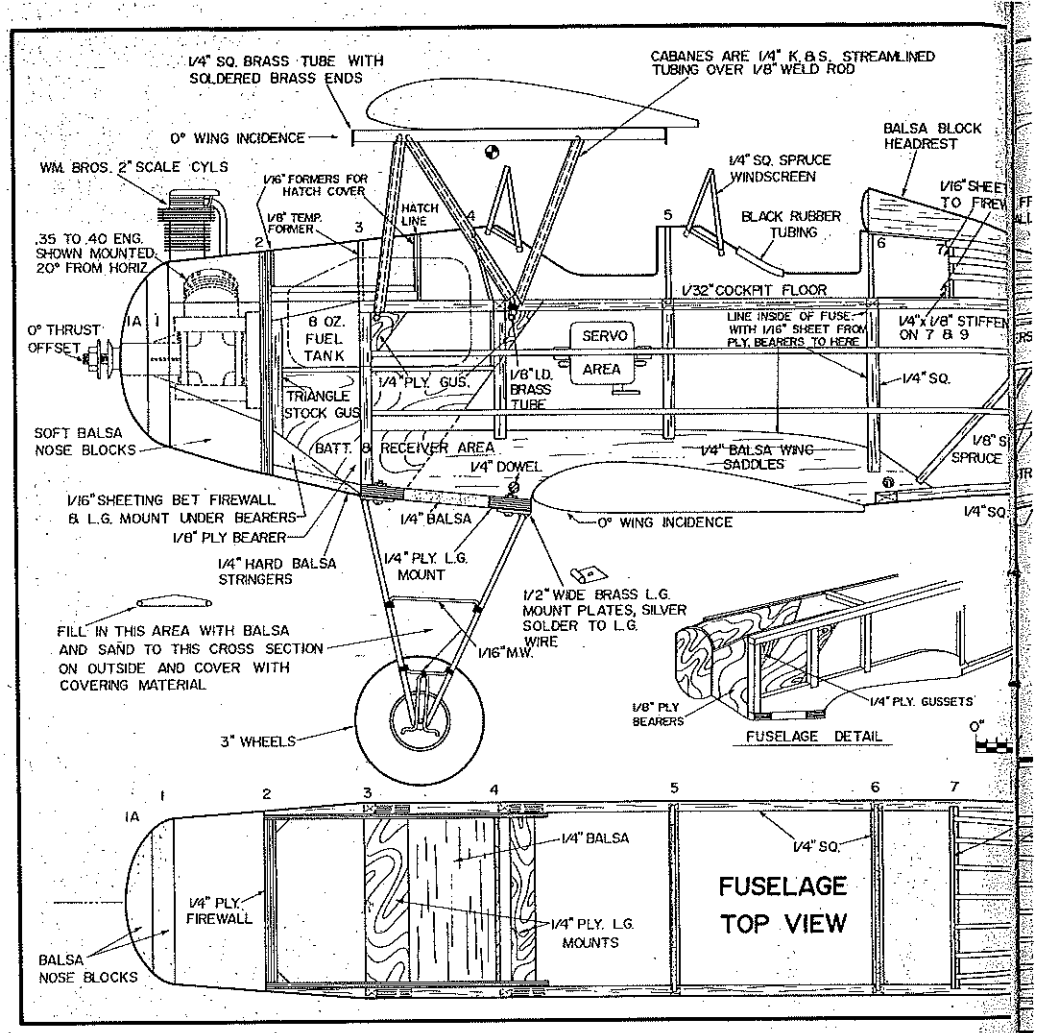
Note how accessible needle valve and venturi are for starting, adjusting. Cabane struts are welding rod sheathed in K&S streamlined aluminum tubing. Muffler and muffler pressure tap are visible—exhaust direction keeps gop away.

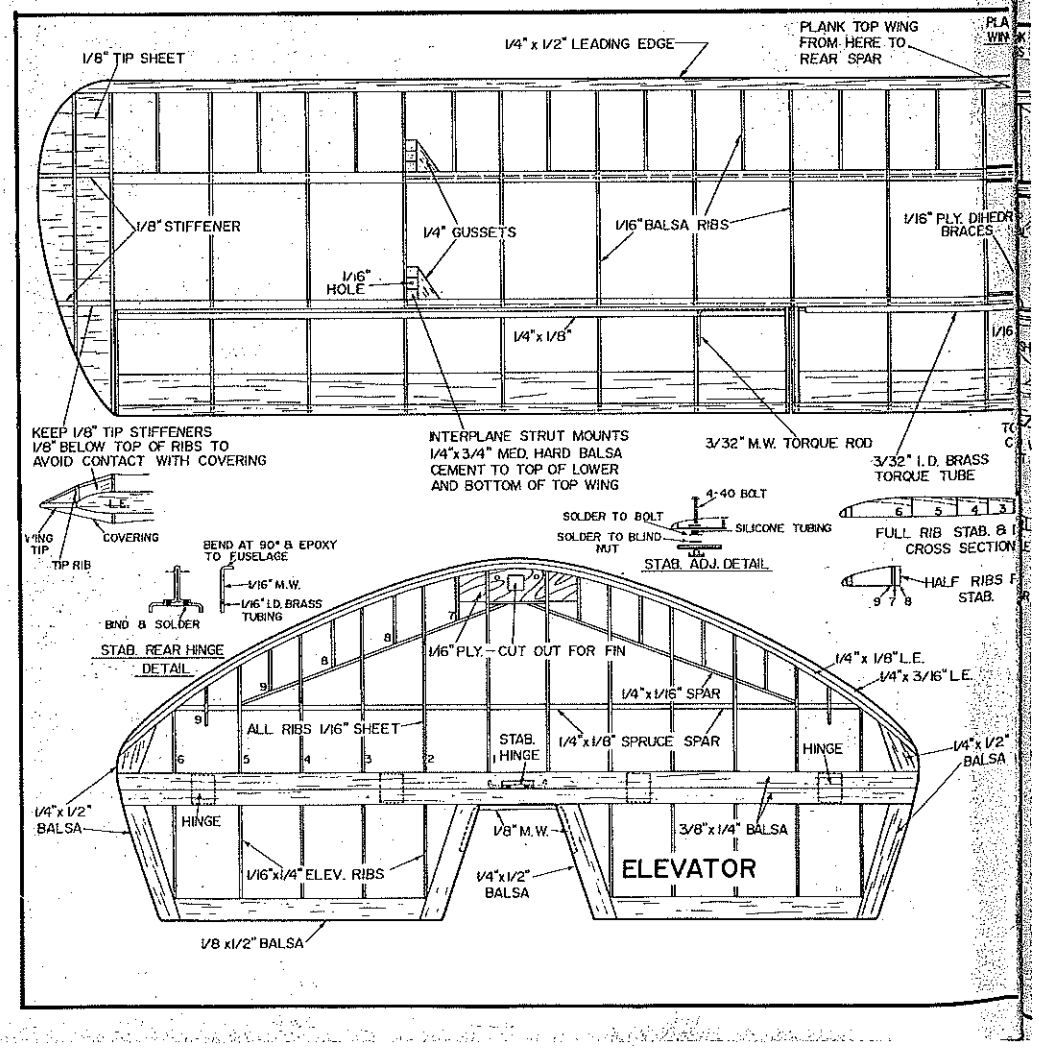


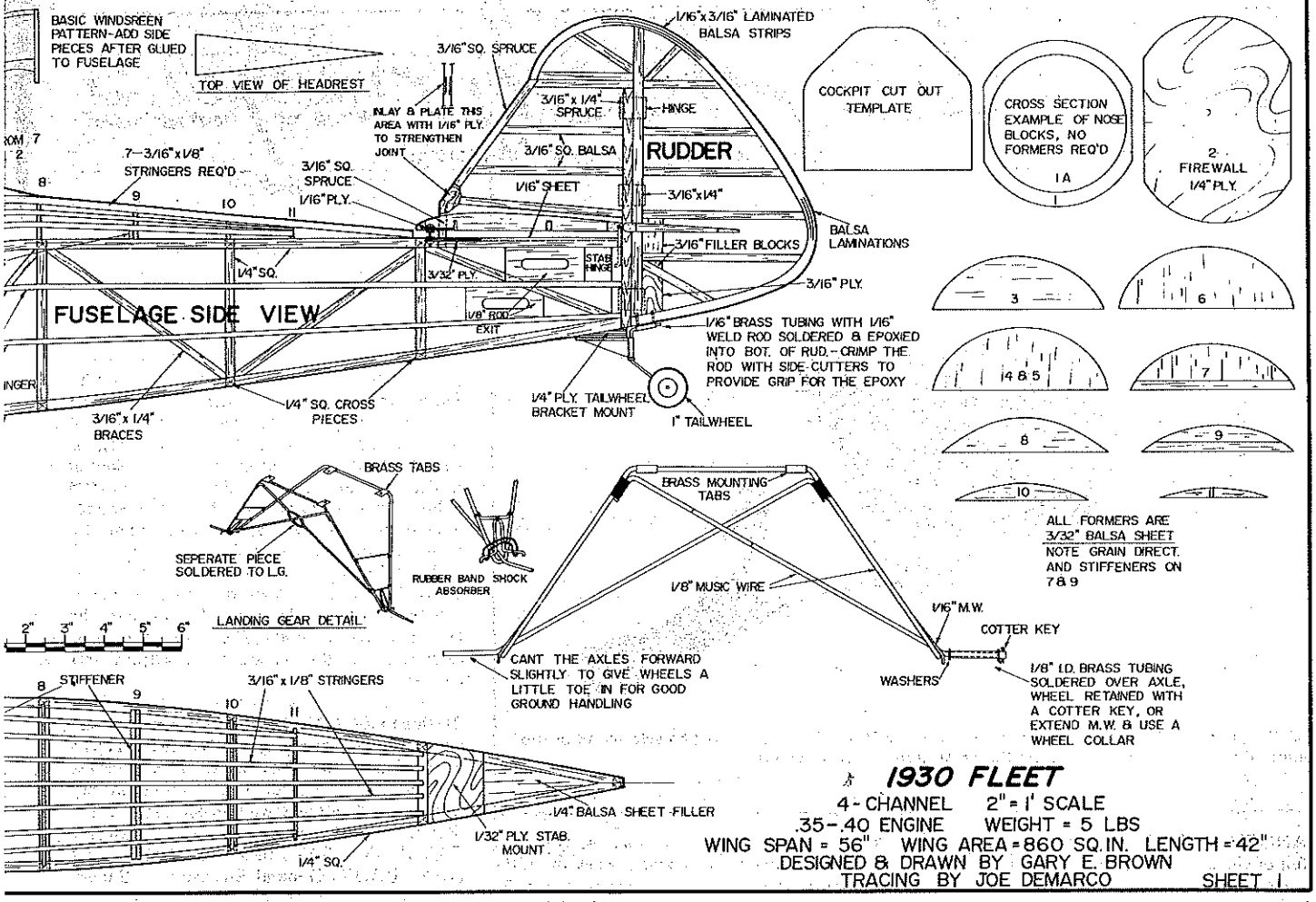
Wing removed to show saddle runners—note that wires to lower wing remain attached in this shot since lower wing is still in place. Windscreens and cockpit coaming look lifelike.



Cross members of the gear serve as axles and are wrapped and soldered to front legs at top. Entire gear removes by simple tabs.

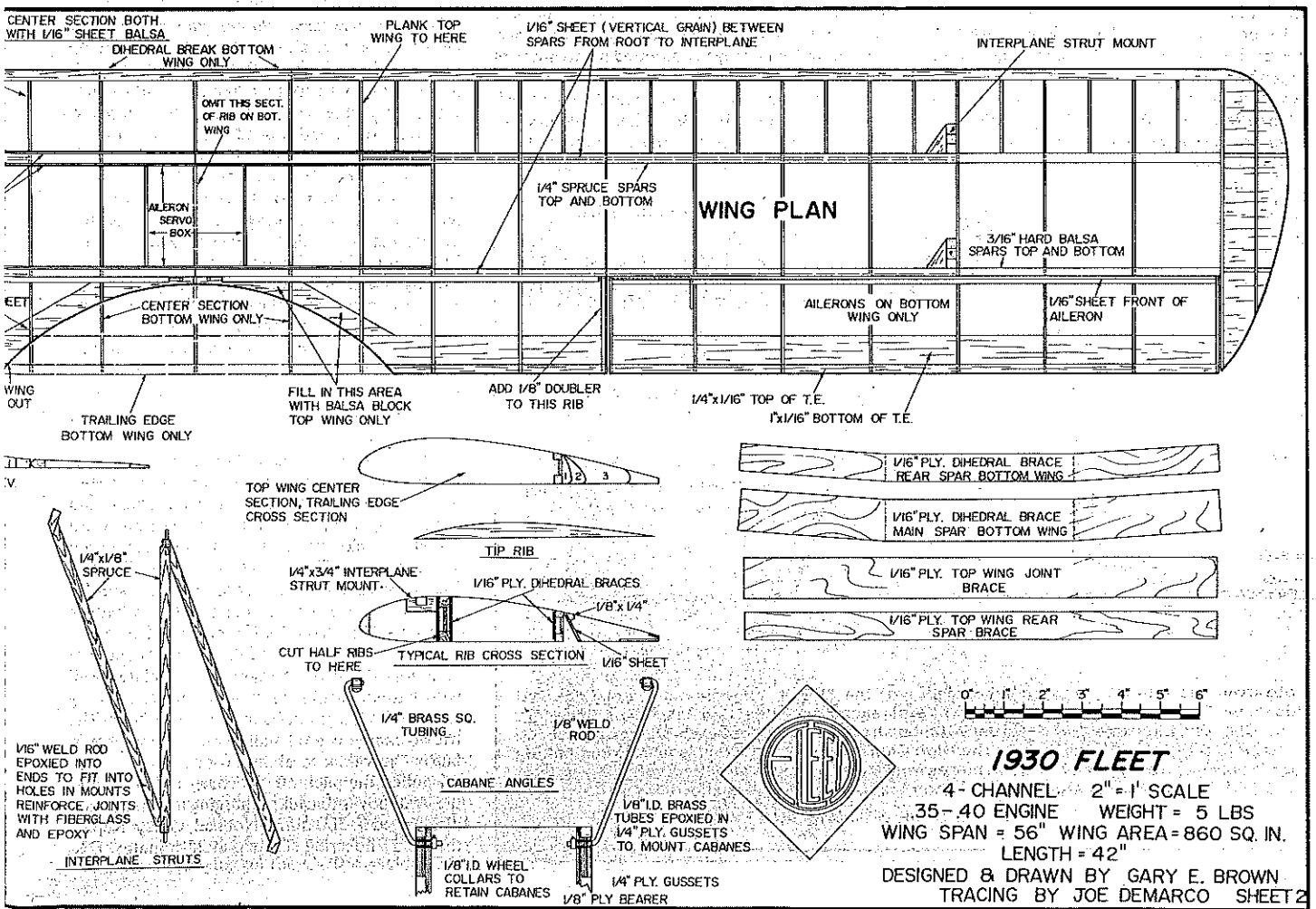






1930 FLEET

4-CHANNEL 2" = 1' SCALE
.35-.40 ENGINE WEIGHT = 5 LBS
WING SPAN = 56" WING AREA = 860 SQ.IN. LENGTH = 42"
DESIGNED & DRAWN BY GARY E. BROWN
TRACING BY JOE DEMARCO SHEET 1



1930 FLEET

4-CHANNEL 2" = 1' SCALE
.35-.40 ENGINE WEIGHT = 5 LBS
WING SPAN = 56" WING AREA = 860 SQ. IN.
LENGTH = 42"
DESIGNED & DRAWN BY GARY E. BROWN
TRACING BY JOE DEMARCO SHEET 2

Fleet/Brown

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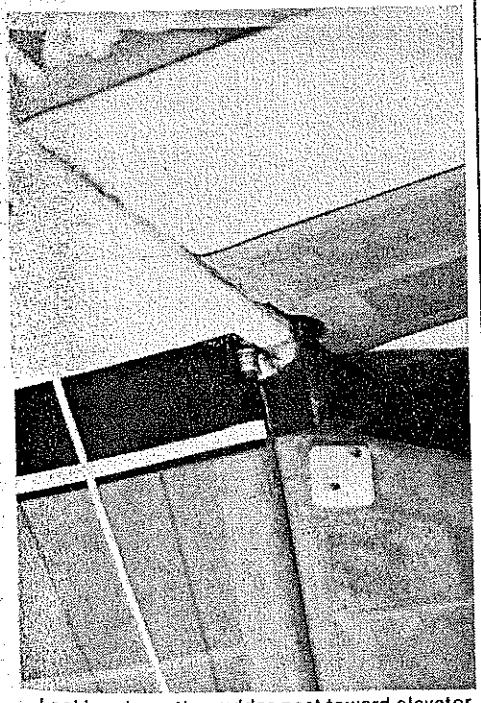
be changed by adjusting two 4-40 bolts just behind its leading edge allowing for an additional trim control. Anyone building the model could easily install a fifth servo to operate the stab, thus allowing for greater in-flight trim changes just as on the full-size aircraft. The stab could also be mounted rigidly as is usually done, if you wish only to use elevator trim.

One other somewhat unorthodox feature is the landing gear suspension which consists of rubberbands acting as bungee cords to take the jolt of landing from the axles. I have used this system on two models to date with very good results and no problems. This method allowed me to use the lower end of the cross members as axles with the top ends soldered to the front landing gear legs.

Wings: Build the lower wing panels to the dihedral break. Build the upper wing panels and join at the center, laminating the spar joint with the 1/16 plywood braces. Finish adding the center-section ribs and sheeting. Cut the ailerons from the lower wing panels before joining with the ¼" spars and dihedral braces. Finish the ailerons and center section ribbing. The ailerons may be activated by either a pushrod and bellcrank system or torque rods. I used 3/32 music wire torque rods.

If you prefer, the wings can be attached with nylon bolts instead of rubberbands. Modify the bottom wing and fuselage with threaded hardwood blocks and leading edge dowels in the usual manner. For the upper wing: bend loops in the upper ends of the cabanes for the screws and securely epoxy hardwood blocks to the spar structure of the upper wing. This will allow the elimination of the sheeting on top of the upper wing. Be sure to warp ⅜ in. washout into all four wing tips.

Fuselage: Begin by building one side over the plans. Build the second side directly on the first to insure that they are both identical. When they are completed, securely epoxy the ⅛ plywood bearers to the front inside of each side. Be sure to make a left and right side at this point. When dry,



Looking down the rudder post toward elevator shows compact and neat installation details that don't detract from precious realism.

carefully align and join the left and right sides with ¼" cross members to form the basic box structure. Be sure to rough up with coarse sandpaper all plywood joints to be epoxied or cemented. Next, add the firewall, formers, stringers, exterior and interior sheeting, etc., to complete the fuselage. Note that the cabane mounting holes in the ¼ plywood gussets are lined with ⅛ I.D. brass tubing.

Next, temporarily bolt your mount and engine to the firewall and fit the nose blocks in place. Shape them to fit the engine and the exterior dimensions.

Tail section: Construct the tail components over the plans as shown. Select soft balsa strips for the laminated rudder trailing edge and stab leading edge. Thoroughly soak these pieces in hot water and carefully work them around a cardboard form of the rudder and stab and tape into that position. When they have dried out, glue them to the rest of the structure. Be sure to strengthen the leading edge of the fin at the joint just above the stab.

Construct the stabilizer trim adjustment parts and check for correct operation while temporarily mounted to the fuselage with the other tail components. After the stab has been covered, epoxy the rear hinge in place on it and permanently affix the two 4-40 bolts by soldering the washer against the silicone tubing to the 4-40 bolt. This will hold the stab up against the bolt heads. Also solder washers to the top of the blind nuts to keep them from dropping down into the fuselage.

Cabanes, Interplanes, Landing Gear: Shape the ⅛ music wire as shown to form the landing gear. Wrap all joints with copper wire and solder. Use ⅛ I.D. brass tubing to join the ends of the music wire. Bend the landing gear mounting tabs from brass sheet, drill for 4-40 bolts and solder to the landing gear as shown. When soldering, use a silver bearing soft solder for the landing gear and other high stress joints. It is much stronger than common lead-tin solder. Remember to clean your joints with fine sandpaper, use flux, and enough heat to allow the solder to flow properly into the base metal. Before mounting the landing gear, put a little toe-in into the axles. This will help the model to track on the ground.

You may have already noticed that some wire parts are specified as welding rod rather than music wire. Copper-coated mild steel gas welding rod (not electric) is what I'm referring to. It comes in 1/16, ⅛, 3/32" and can be a very useful substitute for music wire. It is slightly harder than the threaded 1/16 rod that generally comes with Du-Bro or Goldberg control horn clevises, yet is much easier to work and cut than music wire. I frequently use 1/16 on the forward end of ¼", balsa pushrods to connect to the servo arms.

Practical shock absorbing uses rubber as bungee cords. Landings consequently are quite soft.

Notice that the cabanes are constructed of ⅛ welding rod sheathed with K&S streamlined tubing. I have accidentally flipped the model twice on landing with no bending to the cabanes. You will find the welding rod more than adequate. Bend the individual pieces in pairs so that the left is an exact duplicate of the right. Make the top bends last, after you have slipped on the streamlined tubing. Be sure to measure each strut carefully to insure a level top wing.

Build the interplane struts from the plans and sand to a streamlined cross section. Leave them slightly long to custom fit them to each set of wings. When a good fit has been achieved, epoxy the 1/16 welding rod pins into the ends and drill corresponding holes to fit them.

Finishing: The choice of covering methods and amount of scale detail is up to the builder. I finished the model with Coverite and six coats of clear dope over everything. The markings were all cut from the appropriate color of Coverite and fastened with a little dope thinner. Flying, landing and support wires were made from silver elastic thread found in sewing and fabric stores. The flying and landing wires all have a tiny music wire hook in one end to facilitate take-down of the wings.

The cylinders are Williams Brothers 2" scale with heads made from laminated 1/64 plywood for the fins and 1/16 balsa filler. All of the dimensions, with the exception of a very slightly stretched wing chord, are true to scale. Thus, a competitive stand-off scale model could be constructed from the plans. I chose a more casual approach and purposely omitted much fine detail, such as brake lines, fuel gauges, and a lot of engine detail as my model was intended more for weekend flying than contest work.

Radio: Tuck your receiver and battery pack up under the fuel tank compartment and mount your servos under the front cockpit for the best balance point. Balance as indicated on the plans. If you have built carefully in the tail section, you should be right on the mark or very close. My model did not require any additional nose weight. You've heard it before, and I'll say it again, *don't* be tempted to fly a tail-heavy model!

Flying: Set up your control surface movements as follows: Rudder and elevator should move ¾" both ways at their trailing edges and ailerons ½" both ways. This model has not required any differential in the aileron movement, although adjusting the torque rods to create more up than down movement would probably do no harm.

Flying is the easiest part. With the proper elevator trim, the model will almost float into the air on takeoff, requiring only the usual right rudder correction. The stab on my Fleet needed to be adjusted so that the leading edge was about ⅛" higher than the rear edge with the elevator parallel. This helps to counteract its climbing tendencies at higher power settings.

Start flying with your stab close to level and be sure to have adequate elevator trim as you will probably need some down trim on the first flight.

When landing, don't cut the throttle too soon as the model slows quickly. On the other hand, if your idle is not low enough, the ship can float right past you on landing and be difficult to get down. Begin to pull the tail down in a flare just before touchdown since that airfoil section stab really works! Otherwise, the Fleet flies just like a trainer. Relax and enjoy making big, lazy maneuvers just like the full-size Fleet.

Specifications: Scale 2" = 1'; span 56"; lgth. 42"; wing area 860 sq. in.; wght. 5 lbs.; engine .35 to .40; Four-channel radio; rudder, elevator, motor and ailerons.

RC Technique/Myers

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knew that the shift to low rate would never take place so we used a time clock to shut off the charger after 5 hours (4 amp-hr ÷ ¾ amp = 5⅓ hrs.). It worked just fine. We don't know what the long-term results will be, but we expect them to be good.

When I queried Gerry about long-term effects he told me that all he could offer was the fact that his 6-year-old World Engines transmitter has been attached to the prototype charger for 18 months, with occasional time out for flying and battery testing. The batteries are the original Gould AA, and they still test at 113 minutes on his Flite-Life.

If you now think that Pulse Charging is for you, then pay attention: The C-50/4 is available in *five* models and the coding is a little obscure:

Model I (Serial No. preceded by a blank space) is for charging 4 and 8 cell systems. This is the most common combination.

Model II (Serial No. preceded by an "H") is for charging 4 and 5 cell systems (Kraft Sport series—modification required).

Model III (Serial No. preceded by an "X") is for charging 4 and 10 cell systems (Old Kraft Signature and World Engines).

Model IV (Serial No. preceded by an "S") is for charging 4 and 9 cell systems (Cox/Sanwa—modification required).

Model V (Serial No. preceded by an "R") is for charging two 4-cell flight packs.

The reason for all this concern about numbers of cells is this: The charger shifts from High to Low rate *strictly* on the basis of voltage. That's why you are instructed to check back in 90 minutes after you begin charging. If the High rate LED is still on, you either have shorted the output, used the wrong charger, or have a shorted cell in the pack that the C-50/4 can't fix.

What happens if you forget to check back, and the High-rate LED stays on? First, you continue charging at High rate and the batteries get hot (as my old ones did). Next, pressure builds up in the cells, so the vents open. Eventually, the cells dry out and the charging current ceases to flow. *According to Mr. Jarvis, he has charged 20 packs to destruction this way and none of them exploded or got hot enough to do any damage by heat. But none of them were useable, either.* Users of the C-50/4 will have to learn to check on it.

The instruction manual contains a warning that the case will get uncomfortably warm. Mine doesn't. Bob Aberle's does. I suspect that the difference is in how tightly the transformer plates are connected. A more serious complaint is the fact that the unit has an ungrounded metal case. Since most modelers work in cellars with naked concrete floors, I think that the unit should have a 3-wire plug and cord and only be plugged into properly grounded 110 VAC receptacles. I replaced the line cord with Calectro No. L3-718,

Continued on page 112