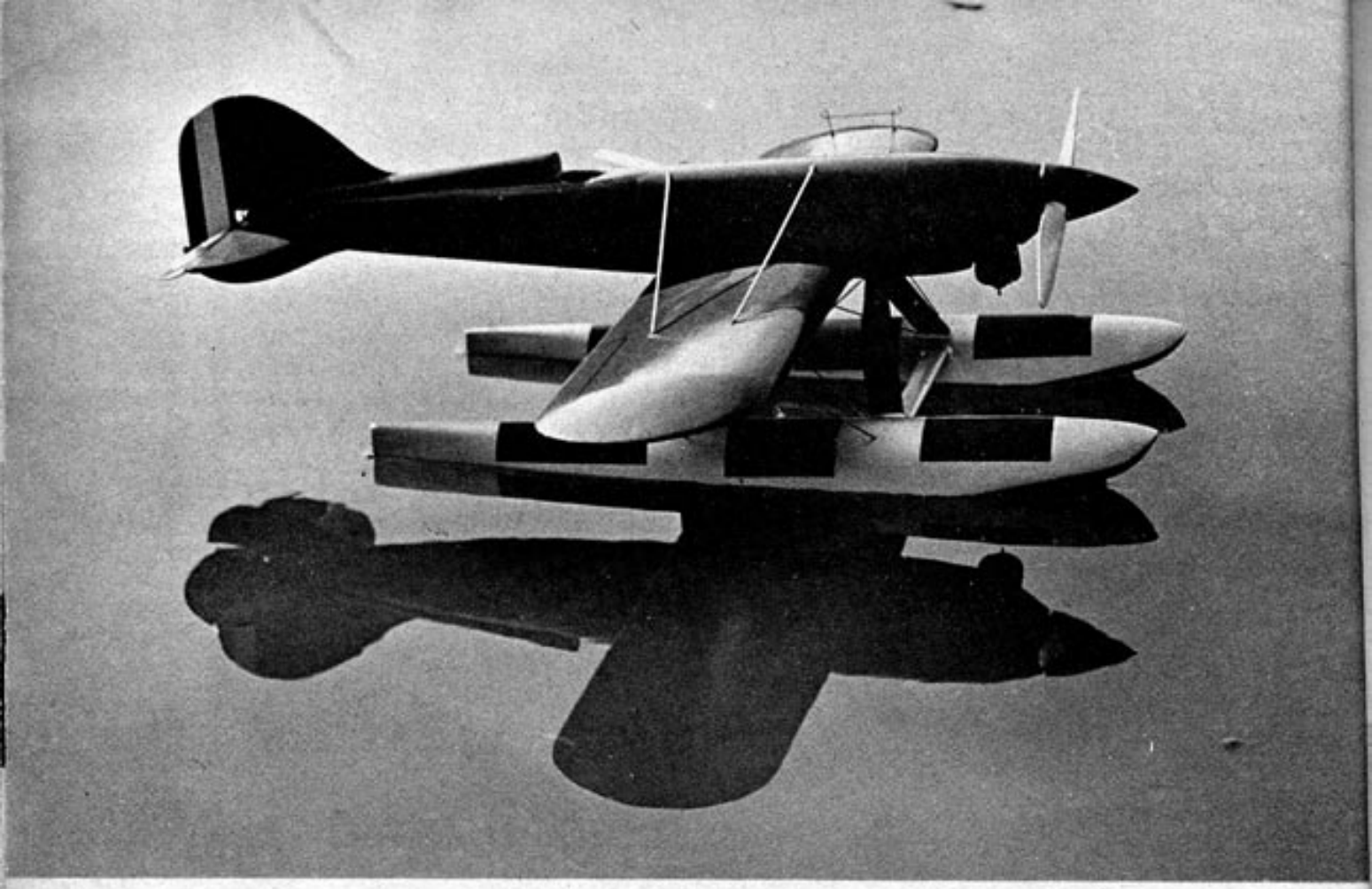


MACCHI-CASTOLDIA

Control line flying scale Schneider Cup racer

Designed and drawn by Paul Palanek

■ Still well-remembered, the Schneider Cup Races brought forth many excellent designs, innovations in construction and use of new materials. The Macchi-Castoldia is one good example. It was built after many years of careful planning by the Italian Air Force.

On June 2, 1933, an Italian pilot, Warrant Officer Francesco Angelo flew the MC-72 seaplane four times over 3 km course on Lake Garda, averaging a breathtaking 440 mph. An official mark of 440.7 mph in 1934 was not exceeded for 6 years and then by a land plane. This Italian machine still holds the speed record for seaplanes using reciprocating engines.

Angelos' was one of several Macchi-Castoldia low-wing monoplanes in the Italian Air Force's high-speed flight program conducted at Lake Garda over several years. Two Fiat V-12 engines were set in tandem; the rear engine drove a shaft between the V banks of the forward engine. Each operated independently; the props revolved in opposite directions which eliminated torque problems. The engines turned up 3,200 rpm to deliver a then fantastic total of 3,000 hp.

Cooling radiators for both the engine and oil systems covered the wings, forward portions of the floats, float struts and sections of the fuselage. Two fuel tanks, one in each float with separate circuits for each, fed two gravity tanks located in the fuselage. The oil tank was carried in the fuselage nose; there were oil coolers on the center and aft deck portions of the floats.

Rumors were that a number of engines burned out before the cooling systems were debugged. Literally, the machine was a flying radiator.

Our model representation is close to scale except for the contra-rotating prop. We devised a "non-scale" land cradle to permit terraferma flights, but the plane is basically a water flyer. Our test model housed a Foster "29" inverted. The beefy structure is such that a "35" could be employed with no fear of over-powering.

Construction is basically simple, with a little more time required than usual because of the two floats. Since floats are a novel item, let us proceed with these (start from the water up!). Check the bill of material and procure the items needed.

Both pontoons (as they are so called) use 1/16" x 3" medium grade balsa throughout except for the balsa nose tip blocks. A crutch system simplifies assembly. Shape profile; with a pencil mark off bulkhead stations on both sides. Cut to shape bulkhead halves—note grain direction. Cement these to the crutch on proper station lines; be liberal with cement since the floats take the landing loads. When bulkheads dry in place fasten the 1/16" sheet balsa bottom. Trim extended edges by following top-view of float pattern.

The only touchy part on the float will be the curved deck. Soak the sheet stock in very warm water, then while dripping wet wrap in place over the fore and aft float deck. Hold with rubber bands until dry. Trim the curved

sheets, then cement 'em in place; hold with pins until cement is set. Sand nose bulkhead flat; cement nose block in place. When all is dry, trim and sand to indicated shape. In making the floats, build both at the same time, thus what applies to one applies to the other.

The fuselage is conventional control-line design and construction throughout. Sides are ¼" x 3" sheet; bottom and top deck, ½" x 2". Shape the formers using ⅛" sheet stock; firewall is ⅛" plywood. Motor mount is from ⅜" x ½" hardwood. Assemble it using both model cement and small brads, then secure it to the firewall and the following bulkhead.

Fasten the bellcrank to a sheet of ⅛" ply between the fuselage sides and bulkheads where indicated. A 1/16" steel wire pushrod soldered to the bellcrank extends well beyond aft end of fuselage. Use 1/32" wire for lead-outs. Just aft of firewall between motor bearers fasten 3 oz. Froom fuel tank with filler and vent lines extending well above the fuselage (to be trimmed later).

Fasten the balance of the fuselage structure, ½" sheet for top and bottom, block balsa for forward top and lower removable cowl. When dry, shape fuselage to outlined cross sections. Fasten ½" x 1" balsa headrest deck, blend into fuselage. Set structure aside, proceed with tail surfaces.

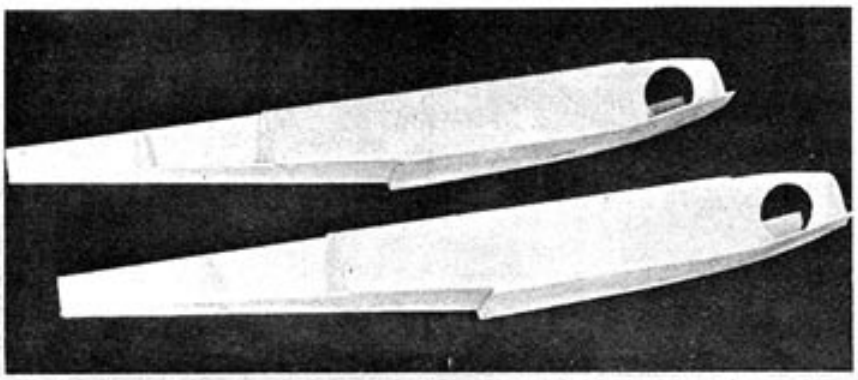
Select medium hard balsa sheet ⅜" x 3" x 36". Run pencil outlines of all surfaces, then trim to size. Cement elevator halves to hinge joiner balsa strip. A large horn is fastened to the completed elevator. Bind at the center with medium grade black thread. Four cloth hinges fasten the elevator to the stabilizer. Notch fuselage as indicated and cement in place stab and elevator assembly. Run fillet of cement around joint using finger to smoothen. Use same technique on fin and sub rudder assembly. In setting vertical fin, cement 3 degree right off-set.

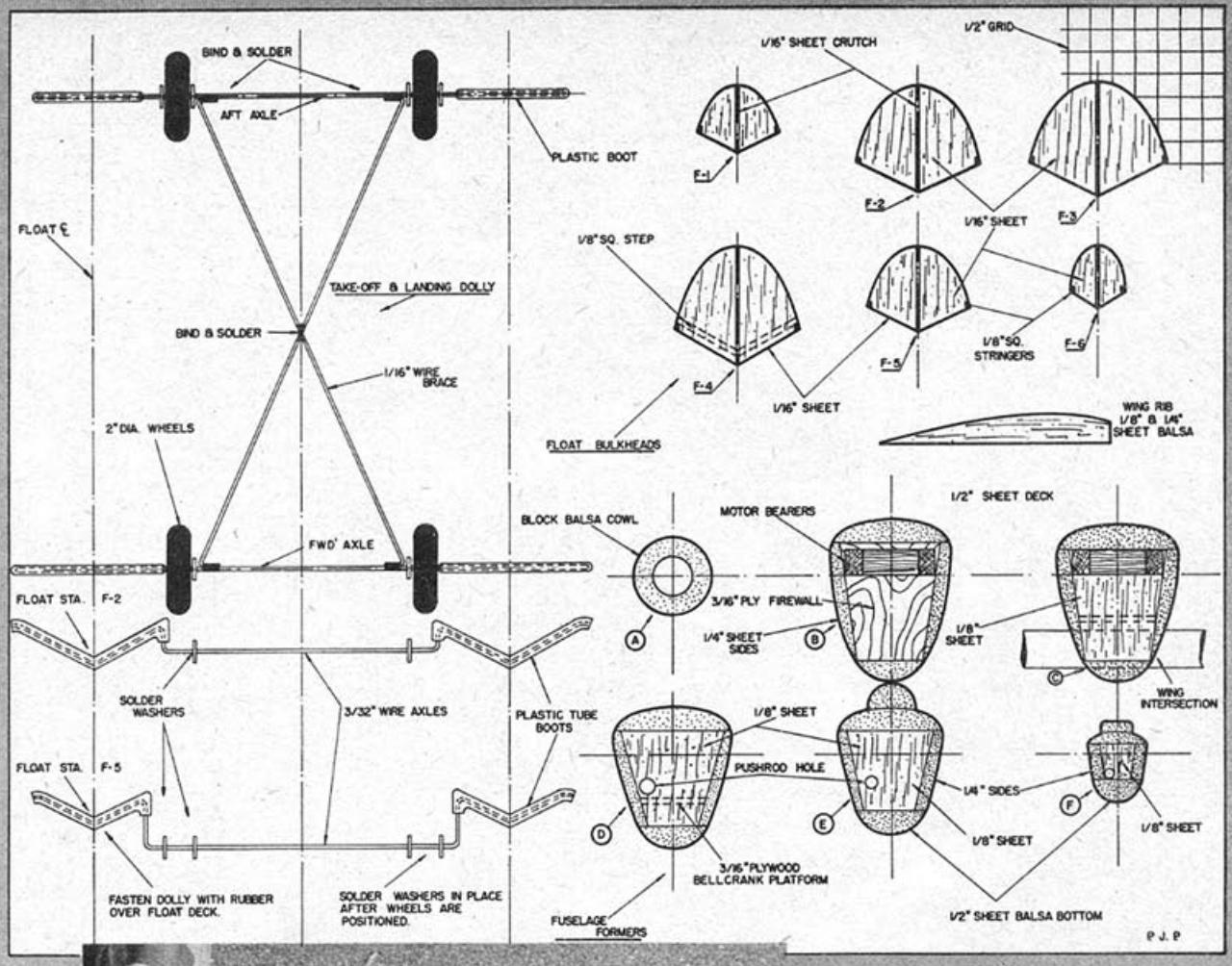
Remaining structure is the wing. Two sheets of 1/16" x 3" butt cement to form 6" wide upper and lower covering. A strip ⅜" x 1" x 36" medium balsa for leading edge butt cements to lower wing covering. When dry, mark off rib spacing, then cement in place the ribs shaped from ⅛" or ¼" sheet balsa. Top wing covering is added; cement from leading edge toward trailing edge. Cement laminated wing tips to leading edge and end ribs, allowing ample time for cement to set securely.

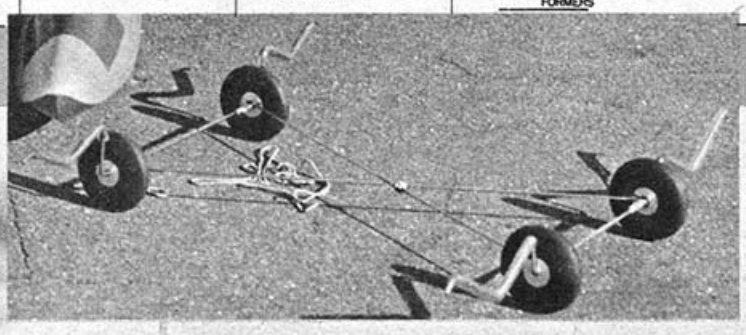
Trim and shape completed wing panel to required contour; a "Clark Y" is employed. Bring trailing edge to a near point then sand a slight radius to prevent fraying. Mark off on the fuselage where wing will pass through. Make the cut-out, cement wing in this notch with zero degree incidence setting. Fair fuselage to bottom covering with block balsa.

As for finishing the balsa surfaces, it is best to work on the assembled model rather than each component. Before doping seal all construction imperfections with balsa wood filler and blend into the contour. Four coats of clear dope are brushed on the covering of all surfaces including the floats.

(*Continued on page 90*)




BIND & SOLDER
AFT AXLE
PLASTIC BOOT
FLOAT ℄
TAKE-OFF & LANDING DOLLY
BIND & SOLDER
1/16" WIRE BRACE
2" DIA. WHEELS
FWD' AXLE
FLOAT STA. F-2
SOLDER WASHERS
3/32" WIRE AXLES
PLASTIC TUBE BOOTS
FLOAT STA. F-5
FASTEN DOLLY WITH RUBBER OVER FLOAT DECK.
SOLDER WASHERS IN PLACE AFTER WHEELS ARE POSITIONED.
1/16" SHEET CRUTCH
1/2" GRID
F-1
F-2
1/16" SHEET
F-3
1/8" SQ. STEP
F-4
F-5
1/8" SQ. STRINGERS
F-6
1/16" SHEET
FLOAT BULKHEADS
WING RIB 1/8" & 1/4" SHEET BALSA
1/2" SHEET DECK
BLOCK BALSA COWL
MOTOR BEARERS
3/16" PLY FIREWALL
1/4" SHEET SIDES
1/8" SHEET
WING INTERSECTION
1/8" SHEET
PUSHROD HOLE
1/4" SIDES
1/8" SHEET
1/8" SHEET
3/16" PLYWOOD BELLCRANK PLATFORM
FUSELAGE FORMERS
1/2" SHEET BALSA BOTTOM
P J. P



MACCHI . . . from pg. 17

Sand the doped surfaces after each brushing with #0-0 sandpaper. After doping, apply four coats of balsa sanding sealer followed with a light sanding after each application.

Join floats with ¼" x ¾" spreaders; pour on the cement, a strong joint is imperative! When dry, fasten forward and aft struts to the fuselage and floats at the same time. Note that the struts and spreaders form a triangle with struts meeting at each angle. Be liberal with that cement. Finish struts with dope and sealer as with the model.

Cover entire model except floats with four brushings of bright red dope, with a gentle sanding after each application. Floats and prop are doped aluminum. Mask around radiator areas and paint them olive drab or chocolate brown. Nose of fuselage and upper aft deck is dark green. Add the balance of the trim such as exhaust ports, aileron outlines and all rigging wire. If hot proof dopes were not used, fuel proof the entire model with two brushings.

Install the power plant, prop spinner and 8-6 prop (found ideal for average flying). Check balance point and add necessary trim weight.

This model can fly anywhere there is water, the beach, pool, lake or pond. We used 50 ft. lines and she flew right off.

Plans show a 4-wheel take off and landing cradle of 1/16" and 3/32" dia. steel wire. This fits under the float bulkheads; "boots" of plastic tubing slip over the wire. Rubber bands secure this unit to the floats. Then you can fly your float plane as a land job.

BILL OF MATERIAL

(Medium balsa and "inches" unless otherwise noted)

One piece ½ x 4 x 36 for wing tip sandwich; (8) 1/16 x 3 x 36 for wing covering, pontoon structure and covering; (1) ¼ x 3 x 36 for fuselage sides, formers and fill, wing ribs; (1) ⅜ x 3 x 36 for tail surfaces; (1) ½ x 2 x 36 for fuselage top and bottom; (1) ½ x 1 x 18 for headrest deck; (2) ¼ x 1 x 36 Hard grade for pontoon spreaders, struts; (1) ⅛ x 2 x 18 for wing ribs; (1) 1 x ⅜ x 36 for wing leading edge; (1) 3/16 x 4 x 18 Plywood for firewall, bellcrank platform; (1) ½ x ¾ x 18 for elevator joiner; (1) ⅜ x ½ x 24 Hardwood for engine mounts; (1) 2½ x 2½ x 5 for lower engine cowl; (1) 1 x 2½ x 5 for upper engine cowl.

Cement; 3" Veco bellcrank; large Veco horn; balsa sanding sealer; clear and colored dopes; balsa filler; pre-cut elevator hinges; solder and paste; 1½" dia. Froom or Banner spinner; 8-6 prop; 3 oz. Froom fuel tank; assorted grits of sandpaper; (4) 2" dia. Veco semi-pneumatic wheels; copper binding wire; 1/16" steel wire; masking tape; .020 celluloid; 3/32" steel wire; plastic tubing.