

C/L NAVY CARRIER CLASS I RECORD MODEL



The first all-metal plane designed and built in the U. S. Extremely rugged, with a high-lift wing, it was shipboard operated.

MARTIN MO-1

**A vintage aircraft's functional design is the basis
for this Junior-age-class record setter.**

DON GERBER AND CHARLES REEVES



The winning records with the MO-1 were set by Don Gerber and son, John, in both Class I and II Navy Carrier. Difference between Classes is use of 40- or 60-size engine.

ONE of the most rewarding aspects of this hobby is the designing of a model and then following through with the building, perfecting, flying, and winning with this aircraft. I tremendously enjoy flying in competition and am always looking for something different, something original that I can call my own.

While going through the books in a library 400 miles from home, I found the first bit of information which led to the design of this model. The book, "Airplanes of the World — 1490-1962" by Doug Rolfe and, of all people, Bill Winter, showed a small drawing of the plane, and gave the information that the MO-1, designed in 1921 as a shipboard observation plane, was the first all-metal plane designed and built in the United States. The word "shipboard" was all the incentive that I needed.

During the summer of 1967 I corresponded with the Martin Marietta Corp. and got a photograph of the real plane and a good three-view drawing. Invaluable was the letter from Martin Marietta verifying the MO-1 as being carrier-based: "In response to your request for verification of the use of the early Martin-built MO-1, our records indicate that this plane was carrier-based along with the bombing and torpedo squadrons of the U. S. Navy in 1924, but was classed as a light-weight scout monoplane."

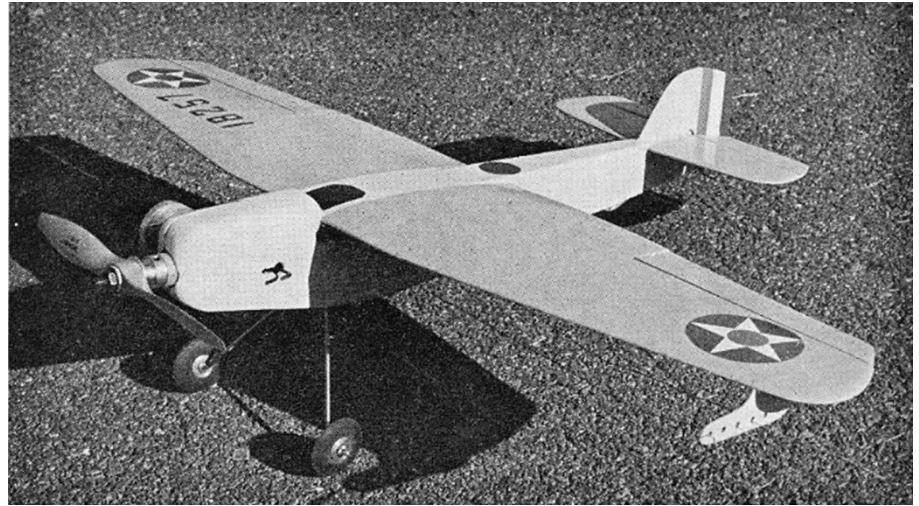
With this information I drew the first set

of crude plans. Later that fall I started corresponding with Mr. Don Gerber of Laurel-dale, Pa., who was the current class I record holder. Since he was interested in the model, I sent him a copy of the information that I had, and a rough copy of the plans I had drawn. That winter he redrew the plans in detail, developed construction techniques for both class I and class II versions of the MO-1. He and his son (John.) built several of the planes of both classes. The contest record of their MO-1's during the summer of 1968 is phenomenal. They had a total of six first-places, five second-places and one third-place, and these include the AMA class I and class II junior records and a first-place win in junior class I navy carrier at the 1968 Olathe Nats for John Gerber. They had done all this, and I hadn't even started construction on mine.

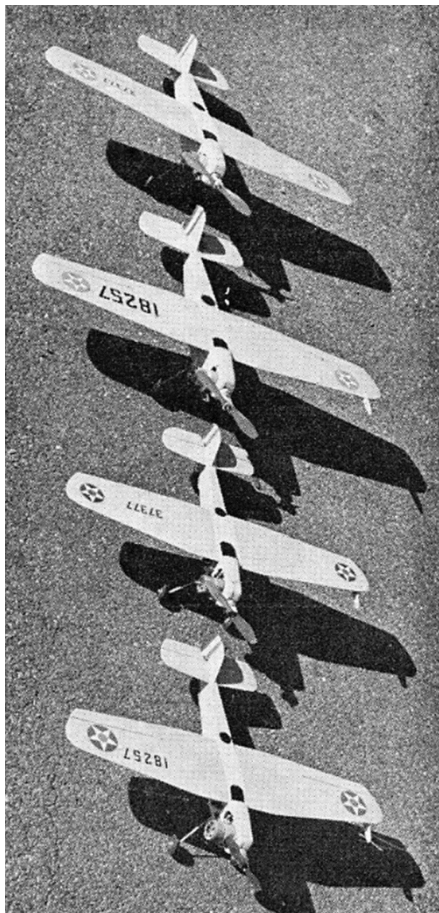
I should make it clear that this is a joint article presented by both myself and Don Gerber, and that Don should receive the lion's share of the credit for developing and testing the model.

If this plane doesn't convert a few of you rat race flyers to navy carrier, then you just can't be converted, because it sure has the looks of a good, clean rat racer. The construction is similar too, with the exception of the metal pan used on most rats today.

Start construction with the solid wing by gluing the 1/8" redwood leading edge to the balsa plank and working down the wing with a razor plane to the airfoil shape shown in the fuselage side view and the wing tip section. Make sure the wing center section bottom is flat, out to the point, where the leading and trailing edges begin to taper, and then works to a symmetrical section at the tip. Don't cut out the ailerons until the wing has been completely shaped and sanded. Notice I said "aileron" and not "flaps." The MO-1 had no flaps, so the ailerons are used as ailerons during low speed to bank the model toward the outside of the circle and hold the



Important features here: adjustable leadouts and hinged ailerons instead of flaps.



Rossi CO speed and K&B 10RR engines set up by Bill Johnson, known as "Throttle Man."

THE GLENN L. MARTIN COMPANY, CLEVELAND, OHIO

TYPE: NAVY SPOTTER	SPEED: 105 M.P.H.
ENGINE: CURTISS D-12 350 H.P.	CLIMB IN 10 MIN.: 4,700 FT.
MODEL: MO-1	SERVICE CEILING: 10,000 FT.

tight.

At this point it would be good to make all the assorted hardware, such as the aileron horns (which I found to be easy to make from mild steel welding rod material), the aileron transfer horn, the arresting hook and tail skid on their plywood mount; the main landing gear on its plywood mount, the fuel tank, firewall, bellcrank mount, leadout guide, and motor mounts.

Some of the special construction techniques developed by Don for this model are now apparent. His first MO-1 had a solid balsa wing which failed in flight, so the redwood leading edge was incorporated to strengthen the wing. Special motor mounts were needed to tie the nose to the wing to eliminate a stress crack in the fuselage at the wing leading edge, so mounts were laminated from birch plywood to tie together the wing, bellcrank mount, firewall, landing gear mount, and the fuselage bottom. Also the top block on the nose was changed from balsa to bass and extended back over the leading edge of the wing. Oh yes, the motor had to be moved as far forward as the nose would allow to keep the center of gravity in a decent location, and since it has been mounted in a sidewinder fashion like on a combat plane, no outboard tip weight is required.

One word about the control unit, and then we'll continue with the construction. The bellcrank is the J. Roberts inverted unit with the bellcrank cut to 2%. These can be purchased from Sturdi-Built, or you can get the custom assembled unit from Bill Johnson, the "Throttle Specialist." Bill's units are made from Sturdi-Built, parts, but because he only does custom work, he can get a better fit and smoother operation. All his units are assembled with countersunk rivets, which adds to their safety factor. I also recommend the use of his fuel metering system which allows the hottest of racing engines to be run on pressure anti yet to be throttled like the best R/C engine. The single throw set-up for the exhaust slide and fuel meter is also available from him by ordering the Don Gerber MO-1 single throw modification.

Now that most of the small details have been discussed, let's start assembling these little parts together to make an operating model. Cut out the ailerons, shape their leading edge, glue the horns to them, and hinge them to the wing with the horns running through the slots in the bottom of the wing. Glue the cap strip over the slots and the leadout guide to the inboard (ip, and the wing is finished.

To start the fuselage construction, drill the motor mounts for the mounting bolts and bolt the motor to them using blind mounting nuts. Then glue in the firewall and main landing gear. Next, mark the centerline on the bottom of the wing and glue the wing to the motor mount unit, making sure to align the motor mount and wing centerline perfectly. Attach the lead-outs to the bellcrank, bolt the unit to the plywood bellcrank mount, and glue the whole unit to the bottom of the wing with the bellcrank hanging down. This will go right around the motor mount.

Cut out two identical fuselage sides and glue the tank to the inboard side. That's right — glue it on! Add filler blocks between the motor mounts and the fuselage side, and glue the inboard fuselage side to the motor mount-wing-landing-gear unit. Make the elevator pushrod long enough to reach to the vicinity of the elevator horn and attach it to the bellcrank. Also, make up the throttle pushrod and run it to the engine. This has been omitted on the plans because of the many types of throttles that can be used. Install this to suit the type of throttle that you are using on your engine. After this has been installed, the engine should be removed, filler blocks added to the outboard side of the motor mounts, and the outboard side of the fuselage glued on.

Shape the rudder, stabilizer and elevators, hinge the elevators, and glue these together as a unit. Now position the stabilizer on the rear of the fuselage, adjust the pushrod to the correct length, and glue the unit to the fuselage, pulling the rear end of the fuselage together at the same time.

The arresting hook and tail skid unit can be installed along with the rest of the aileron linkage. The spring should be just strong enough to pull the hook down and deflect the ailerons, but not strong enough to flip the plane up on its nose. With the addition of the fuselage planking on the top and bottom, this thing finally looks like a plane. But wait, it doesn't have any motor now! You took it out. Remember? Build a removable cowl section into the outboard side of the nose. This should be just large enough to get the motor in and out, and to get to all (he plumbing and throttle linkage required for your engine.

The finish consists of two coats of clear dope lightly sanded, one coat Hobbypoxy Stull' wet sanded, and one coat of Hobbypoxy color sprayed on. The color scheme is gray fuselage and wing and stab bottoms, with yellow wing and stab tops. With red, white, and blue stripes on the rudder, and the white star with red center on a blue circle on the top and bottom of each wing, it makes a colorful little plane. The total weight should be 24-26 ounces. With this lightweight and small size, the MO-1 is a real competitor, so why don't you build one and compete?