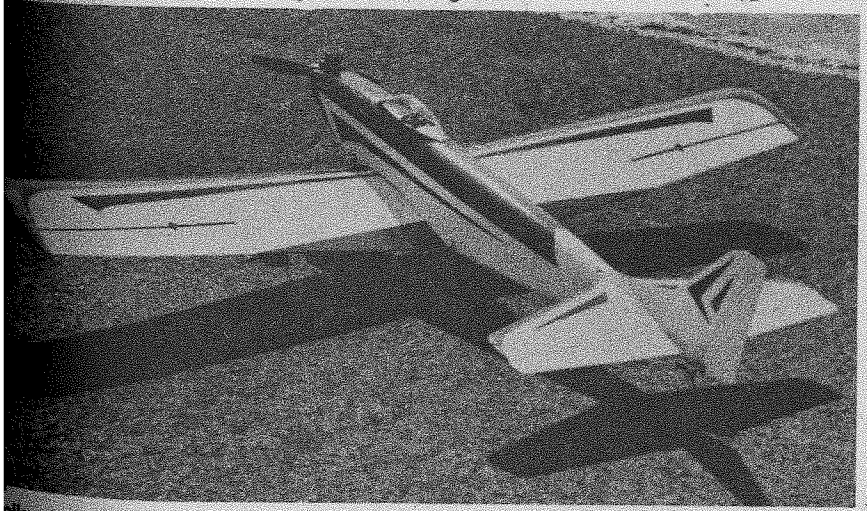
ailer, lighter, cleaner, Ed's Orion replaces dified "Astro" he flew last year. Important feature is balancing of aileron effect to eliminate yaw. High stab gets away from downwash.

noother maneuvers, better approaches and ndings, improved ground handling, spark- ng performance are yours with this fine nulti" for RC. Engines in the .45 class.

ORION



ailer stabilizer, further forward, drops the during slow flight, approaches, getting ay from high-speed touchdowns, ballooning. Elevator area, movement, must be as specified. Above—Ground handling excellent. Gear design (see text) helps control effects of side gusts.

by ED KAZMIRSKI

Editor's Note—MAN has not published a contest multi-control RC design since the Astro Hog in April 1958. The "Astro" has been so widely accepted as the airplane for this event that, until now, no equal, or better, ship has been available. In capable hands, the Orion achieves a new standard of high performance. Its designer, Ed Kazmirski modestly makes no claim that the Orion is a better airplane. In MAN's opinion, the Orion is the best multi offered to date. But remember that we, not Ed, said that!

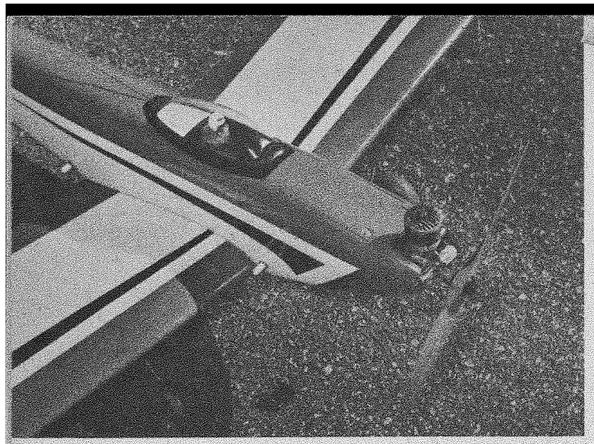
The Orion, like any airplane design, is one answer to a problem. The problem, in this case, was the need for a ship capable of more nearly perfect maneuvers. Through 1959, I had flown the Astro Hog design, but with various modifications to improve maneuvers. But it takes more than an Astro to beat an Astro. While it is always possible to cite areas of possible improvement in any design, it is not possible to offhandedly put a design on paper that would achieve these improvements, especially when the existing design is conceded everywhere to be *the* airplane for multi competition.

A list of performance standards must first be established. By studying our own past contest experiences, certain weaknesses, which occurred during various maneuvers with our past ships, were evident. Mainly, it was decided that a good contest ship had to be smooth flying at all times.

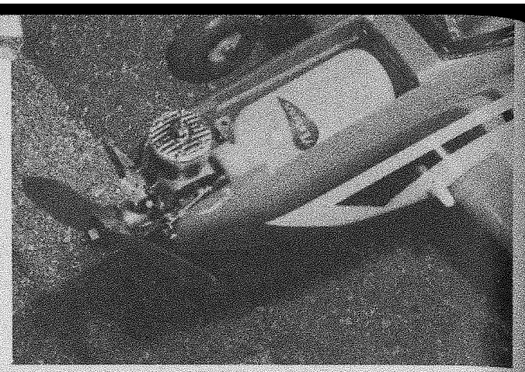
Keeping all of these things in mind, an entirely new design was worked out. The ship then went through a development period of about three months. During this time we worked on everything we felt would increase the performance of the ship. This resulted in much flight testing, working with "moments", center of gravity locations, and wing and stabilizer areas. A good design involves a lot of compromises.

For a long time, we felt that the stab, being mounted on the bottom of the fuselage in line with the wing "wash" caused some problems in certain flight attitudes. Even in dead calm evening air, we noticed some buffeting in last year's ship. This we thought was caused by wing wash over the stab. The new design has the stab mounted well above this area, plus being trimmed to fly tail high in level flight. This high stab location does appear to give an improvement in smoother flight.

Since ailerons are used a good part of the time, any improvement made here would be a big help. We went out to the local airport with a pad and made sketches of the many different types of hinging arrangements found on full-scale air- (*Continued on next page*)

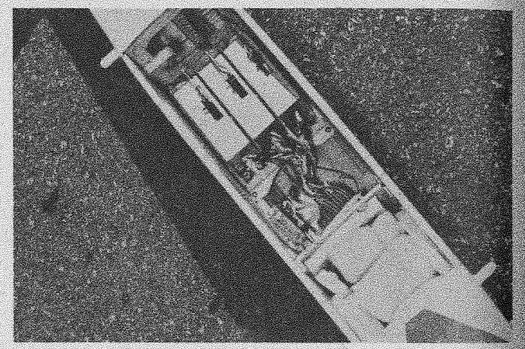


Aerodynamic cleanness helps maintain wide safety margin above the stall speed during maneuvers — note careful fit of the tank hatch.



Standard plastic tank fits close to engine. Carved soft blocks give top fuselage shape and strength. Notes on plug, fuel, given.

Below—Rudder, elevator, engine servos side by side, mounted under fuselage platform. Receiver in foam. Note multi-pin connectors.



craft. They all seemed to follow a regular pattern except the Piper Apache. Its ailerons were hinged below the bottom surface and behind the leading edge of the aileron. After making a mockup of this type of hinging and studying its action, we found that it might solve some of our problems.

When we apply right aileron, that aileron goes up, and the left aileron goes down. At this time we want one unit of pressure pushing the right wing down, one unit of pressure pushing the left wing up. Also, we should have one unit of drag on the right wing and one unit of drag on the left wing. This would give us a good turn or a good roll. On the conventional aileron this is where we get in trouble. When the left aileron (*Continued on page* 48)