CANADIAN SAUCER

REAL EYE-OPENER

■ "Plato" is the third of a series of saucer designs employing the reflex wing section. I had used the section with some success on a Wakefield type fuselage model "way back when." But for radio control and "minus dihedral" this was something else again. In order to bolster my courage, a series of tests were conducted with sheet balsa gliders of all shapes and sizes. These tests proved that the reflex is a remarkably stable method of obtaining lift. Still to be answered, however, was the question of scale effect when enlarged, higher wing loadings, and the necessary ruggedness for radio control.

Plato I was a 24" saucer, high wing design with the motor mounted above the wing on an extension of the rudder, 6" back from the leading edge. It was underpowered with an .074 diesel, so an .09 was installed. This proved adequate to get it up there but it was simply too groovey. It would fight a turn and use up about 250 feet in a circle. I've laid this one aside for future use from my rocking chair.

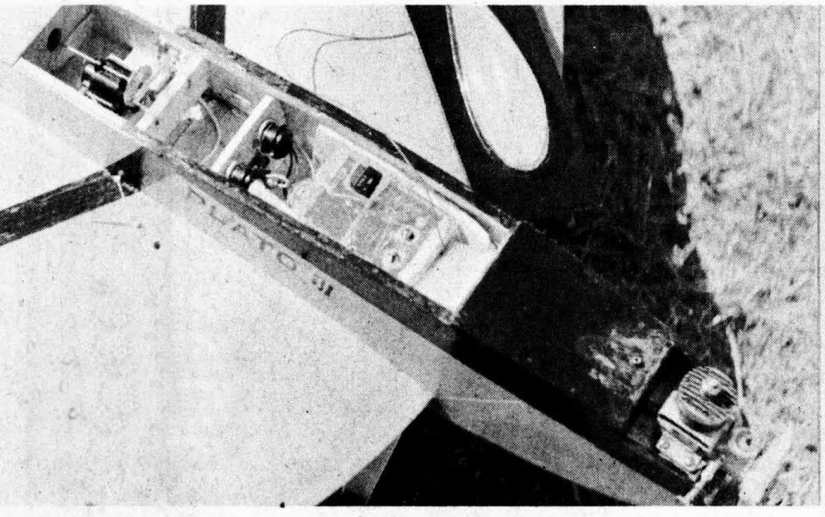
About this time the Pee Wee .020 motor came out and provided the inspiration for Plato II, an 18" saucer. It was a high wing design but this time the engine was in its normal position in the fuselage. The weight, 14 oz. overall, made the wing loading a little high, but it was much more nimble than Plato I.

The first two designs proved the efficiency and strength of the reflex section. It remained to improve the serviceability and simplify the construction so that it could be built with the minimum amount of time and effort.

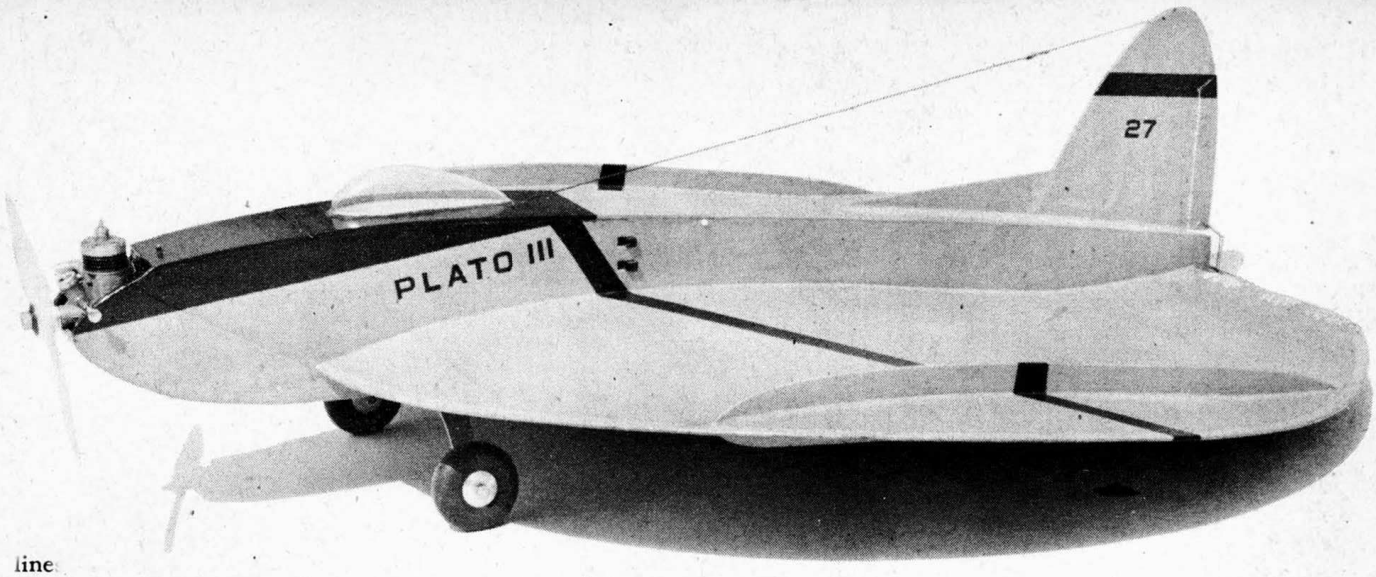
To achieve this, Plato III was built. The wing was lowered and a hatch provided on the top of the fuselage for easy access to the receiver and actuator. This was done with some trepidation as to its effect on stability. There was no need to worry however, as it had little effect on the flight characteristics. In addition, ground handling was much improved—take-offs as straight as an arrow and those greased landings without nose overs that are typical with low wing designs.

The fuselage is composed of a top and bottom deck. The wing, a 30" disk of ⅛" thick sheet balsa, is sandwiched between the two, giving it its peculiar curve that imparts the necessary rigidity in flight. The fuselage sides are made by transferring the outline from the plan onto a sheet of ⅛ balsa. Then trace only the curve which is identified as the top deck line onto the balsa sheet. This line extends from the tail end to "B" and down to the bottom edge. After cutting and sanding the outline, carefully cut along the top deck line. If this is done accurately in one continuous cut, the ⅛" notch for the wing is provided by simply cutting ⅛" off the bottom of the lower deck with a straight edge. Using the two pieces as templates, make two for the other side of the fuselage. This is a good time to make the four pieces for the fences out of hard ⅛ sheet balsa using the fuselage sides to draw the wing section curves. Shape the bulkheads and assemble the top and bottom decks separately. Note that the planking along the top deck line is on the inside and flush with this edge, and the same applies to the planking along the bottom deck line.

At this stage it's a good idea to get on with the wing. Select the harder balsa sheets that you have for the leading edge. Double glue all butt joints to insure strength and a smooth contour when the sheets are curved. You should now have a panel approximately 30 inches square. Draw a center line on both sides running 90° to the grain of the wood and the butt joints. Inscribe a 30" circle from the point marked on the center line. For this purpose, I made a trammel bar from a piece of ¼" square balsa just over 15" long, tied a pencil to one end and stuck a straight pin through the other at a 15" center. Crude, but it works fine. Cut out the disk and sand with fine sandpaper on both sides, leaving the center line visible for reference. Now sand a radius around the outside edge. This is the time to do the finish sanding on the wing as it is impossible to do a good job after it is formed. Measure over from the center line 11½" each side of the center and locate the lines for the fences on the top and bottom of the disk. It is important that these lines are parallel with the center line of the wing. The wing can now be glued to the bottom of the top deck, lining the center line of the wing up with a center point on



Radio Controlled "Plato" platter designed by Ernest Houslander



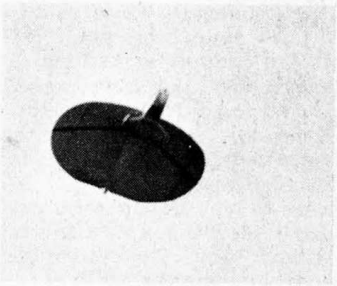
line
or

the fuselage. Then glue the bottom deck into position below the wing. Attach the fences on the lines drawn in the exact position shown on the plan in order to preserve the same curve from the fuselage to the wing tips. The remainder of the fuselage is straightforward and should present no problems.

Before covering, the crinoline is applied to the nose and around the edge of the wing. The following technique for around the wing is suggested: Cut out strips of crinoline 1¼" wide with a straight edge. Fold lengthwise along the center of the strip and crease to form a "V." Spread a coating of fast drying glue on the first inch of the tape. Starting at the fuselage, wrap it around the edge, pressing it in place with your fingers until the glue oozes through the crinoline. Let it dry thoroughly. Now peel back the tape and apply glue for about 2" further along, grasp the free end of the tape and stretch tight around the radius. At the same time smooth out the wrinkles with your fingers and hold for a minute until the glue sticks. Repeat this procedure all the way around using a generous amount of glue so that the tape is well saturated. Apply two additional coats of glue all around the edge, allowing each to dry thoroughly. This adds greatly to the strength of the wing and prevents the edge from splitting.

In order to save weight, colored silk was used for covering. Silkspan could also be used, but avoid colored dope except for minor trim. Stitch on the rudder and elevator using nylon string for the hinges.

The center of gravity location was determined after a considerable amount of experimenting. The balance was achieved using 5 pen cells and one 30 volt battery the battery compartment. There is plenty of room in the bottom deck to move the batteries if necessary.



Control is achieved by the Simple-Simul system, a Mighty Midget providing the muscle, still the most control for the least sweat. The ESSCO TRT receiver, and Crescent Puls-Air Pulser provide reliable operation. The crank on the torque rod should have a ⅜" throw and be positioned to give 10° down and 20° up elevator.

Give the radio equipment a final check and you are ready for the test glide. With the radio operating, set the pulser going and trim in a little up—yes, I said up elevator. Now launch straight out, the plane will assume a nose high attitude and land this way. You can rear back and toss the high hard one with the same result—no stall and dive, but just a settling to a nice landing.

If you are over the shock of seeing a low wing minus dihedral, glide without cluttering up the landscape, you are ready for powered flight. A good .15 motor provides lots of power so it's a good idea to restrict the intake to cut down the power on the first few flights until you get the feel of things. You can stooge along with the nose up and not get into trouble. When you gain confidence you can open her up and with a little down trim Plato will really bore along. You can expect a quick response to the stick in level flight. Full left or right will turn Plato on a dime in a vertical bank but it will straighten out just as quickly when the stick is returned to neutral. Press the full on button, which on this system gives full left rudder and full up elevator and Plato will execute flick rolls at the drop of a hat. Plato flies well on rudder only. With escapement rudder only, reduce the throw of the crank on the torque rod to ¼" and set the elevator at the position shown on the plan.

So there you have it. A versatile and rugged little performer which will more than repay you for a few hours of careful construction.