



We have used the following cliché too often, but "up, up and away" just fits this picture of the author handlaunching his Mini-ot plane.



Bob didn't inform us as to just why he is down on one knee while landing his bird. Maybe he presents a better target to the small plane!

FIELD AND BENCH

ACE MINI-OT PLANS ACE COMMANDER R/O BABY SYSTEM

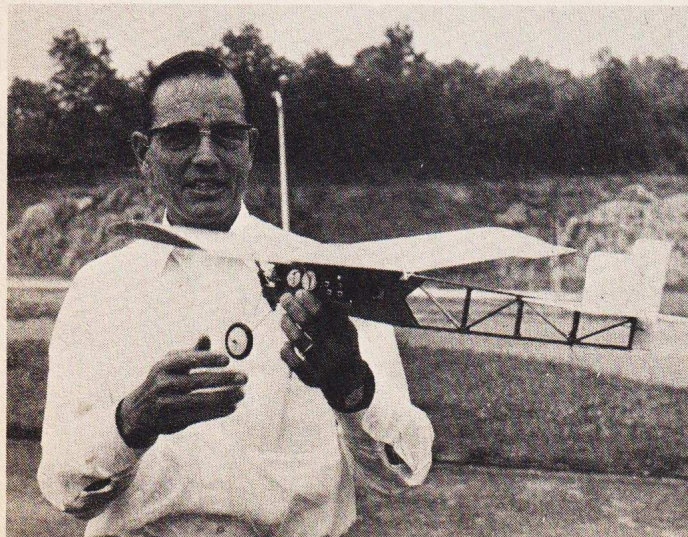
BY ROBERT EHRLICH

► "PLANS!" I said, when Walt called me about doing this article, "You know I've always built from a kit, and what's more, the last one was A R F and 7½ pounds at that!" Nevertheless, after some smooth talk, a little logic, and reminiscences of flying rudder only with a small plane, I embarked on what has turned out to be a real "fun" modeling project.

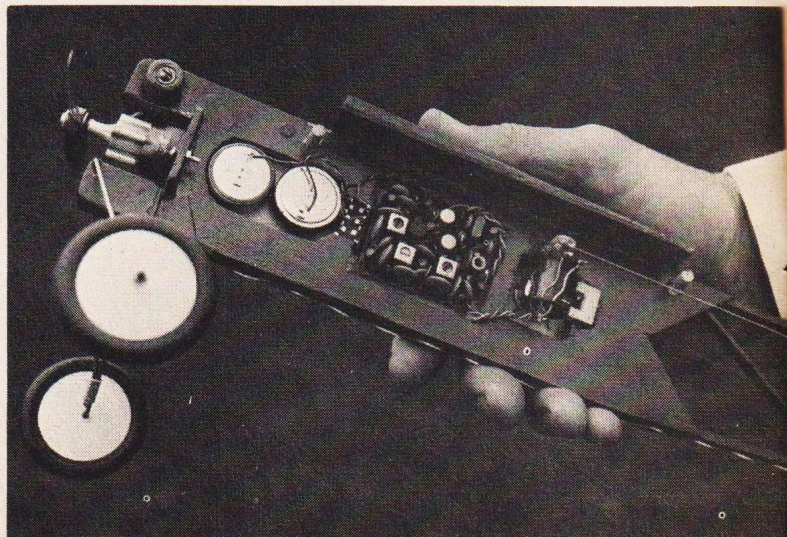
It turns out that for a small plane like the MINI-OT, plans do have a certain logic as opposed to a kit. All a kit does, besides providing the plans and a pile of lumber, is to provide pre-cut stampings of the flat pieces. But here the flat pieces don't amount to much—just a

couple of fuselage sides and the wing ribs—so the whole process is just about as easy as building from a kit.

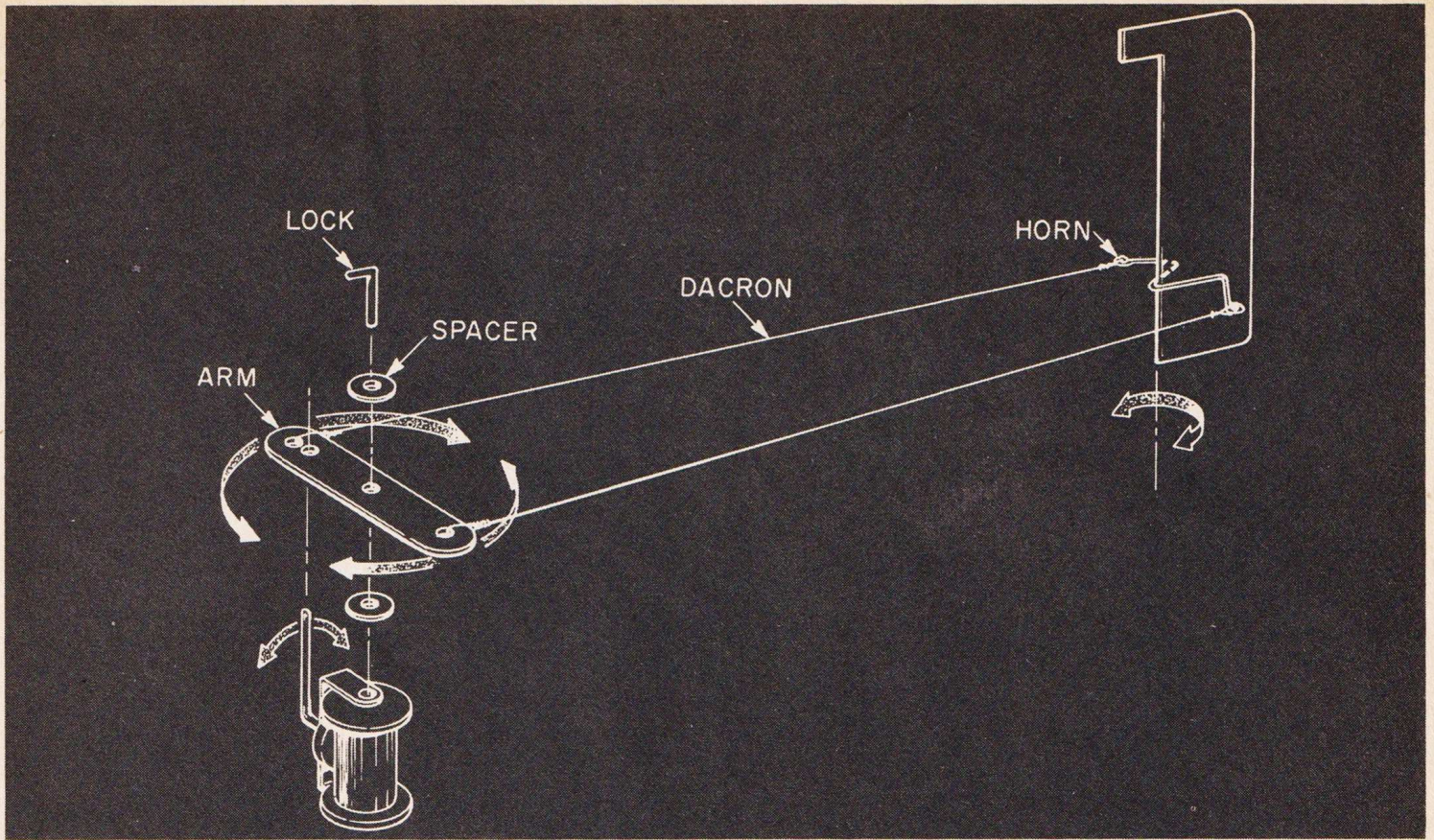
Fun? OK, you gallon-burners. Consider a calm summer evening, after supper. You're out at a nearby vacant lot or schoolground (no field problems here). Your field box contains a battery and a few ounces of Cox Red. A couple of minutes later the plane is circling upward against the sunset—don't forget you have to compensate for the breeze. The motor quits just as the ship passes the brightening moon. "Yes, sonny, I can still control it after the motor stops." A couple of wide circles and it's at your feet again, ready for the intrepid



Checking decalage — 'relationship of wing chord line to stabilizer setting to thrust line' — and found that it came out exactly as on plans.



Close-up of the forward section of the fuselage to show installation of radio, batteries and Adams actuator. Note weight above the engine.



Looking for combination plane/radio system that will take you out of the rut and put fun into your flying then try Ace's single channel package of system and plan set and fly it in the school yard!

aviator once more. . .

The MINI-OT is one of a series of plans offered by Ace Radio Control, Higginsville, Mo., designed to be compatible with their Commander R/O Baby Package. Before going on with a discussion of the plans and the model, it would be appropriate to make a few comments on this radio system.

The Commander R/O Baby Package is the smallest of three radio systems designed around the use of the Adams actuator for rudder-only flying. All three use the Pulse Commander trans-

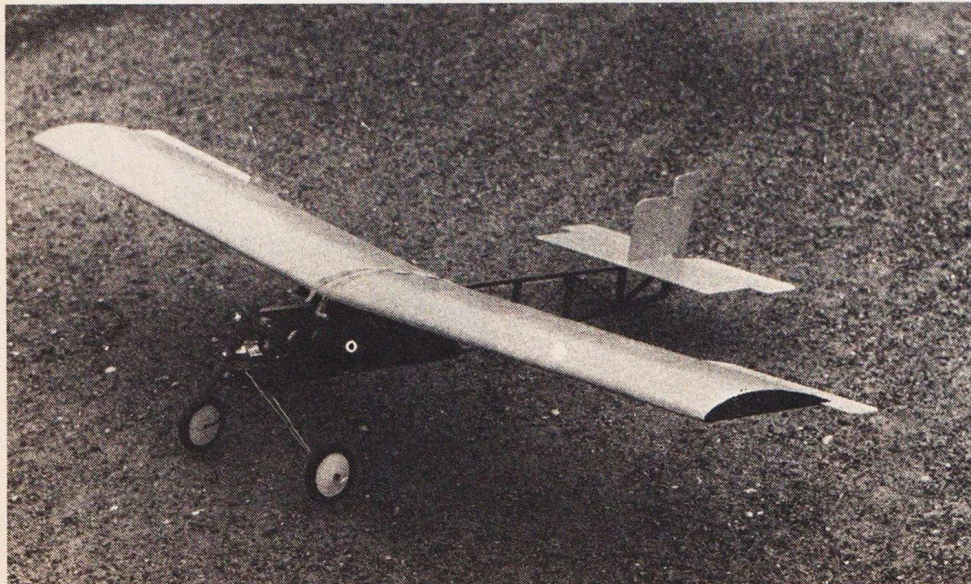
mitter and the 2.4-volt Commander DE (double ended) superhet receiver. They differ only in the size of the actuator and the batteries supplied. As the smallest, the Baby weighs in at only 2½ ounces flying weight. (There's a challenge for you, Bob Dunham!)

I found the transmitter quite easy to get going. All you do is screw in the antenna and the control handle, connect a 9-volt battery (276 type) and you're on the air. (Reminder—this transmitter is powerful enough to require an F.C.C. license.) I found the adjustments had all

been made just about on the nose, with the result that the tone pulses were 50% on and 50% off at the neutral control position and almost full on or full off at either extreme of the control. Pulse rate was 5.6 per second, and the tone frequency 900 Hz. In passing, I'll mention that these adjustments are fine for an Adams actuator but quite different from the conditions wanted for pulsing a galloping ghost system.

I happen to own a competitive brand transmitter that was designed for the same general range of applications, so I was able to make a few comparisons. Both provide good clean tone signals, and each seems to put out about the same amount of radio signal as indicated by a field strength meter placed nearby. At range, however, the signal from the Ace transmitter seemed a little weaker. I believe this is because the base-loaded antenna system (coil inside the transmitter box) is a less efficient radiator than a center-loaded system (coil up in the middle of the antenna). Advocates of base loading point out, however, that such a system is less likely to have nulls in certain directions. Tinkerers note: Please don't try to put a center loaded antenna on your Ace transmitter; it won't work!

One other thing about the transmitter I found by accident. Inadvertently, I had left the transmitter on for several hours, and the battery was down to



At rest on the tarmac, in this case local high school athletic field—very functional little bird.

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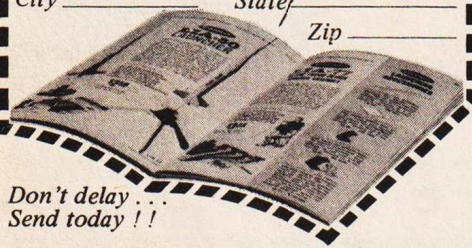
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Field and Bench

about 5 volts from the original 9. Nevertheless, the transmitter was still on the air with a weak but respectable pulse signal. Of course, you're supposed to change the battery as soon as it drops to 8 volts, but this experience gave me assurance that the circuit is not critical and that it would not be likely to drop out of oscillation in the middle of a flight.

Turning to the receiver, I was impressed with the sensitivity of this unit, especially operating as it does at only 2.4 volts. All the adjustments were found to be OK and only a slight adjustment was needed to peak the antenna coil, as recommended in the instructions. With its accompanying transmitter, I found the range to be in excess of 500 feet on the ground, which is certainly adequate.

The package comes complete with the appropriate two 225 mah nickel-cadmium cells and—thoughtfully—a piece of foam rubber. Wiring is completed between the receiver, actuator and switch. In the package I received, the battery pack was not wired, because in the profile configuration of the MINI-OT the two cells have to be put side by side rather than in the usual stack arrangement. Since it is not unusual that changes might have to be made in the battery setup, I would think it appropriate for the instruction booklet, which is quite complete in other respects, to include more details on how to wire the battery, how to keep from having shorts, etc.

Now let's turn to the plans. It might be nice to say at this point that these plans are just the thing for your junior, along with the Commander system, to get him started on his first airplane; however, I would have to add the reservation that he couldn't do it by himself. The plans as presented are a good means of communicating the ideas of one modeler to another, but they omit quite a bit of the information needed by a novice. There is no bill of materials, nor is there a series of step-by-step instructions. And there are a number of points that would baffle a novice, such as where the switch should go for the radio, how to fasten the landing gear to the fuselage, how to sew a hinge, how to fashion a needle valve extension, and many others. A modeler with two or three planes under his belt will have little trouble figuring out what needs to be done, but a novice would need considerable help.

Building the MINI-OT itself is so simple it's ridiculous. As you could probably tell by now, it's a profile airplane. The main part of the fuselage is simply a sandwich consisting of 1/4" balsa in the middle with one side of 1/32" plywood and the other of 1/16" balsa. Appropriate cutouts are left for the battery cells, the receiver, and the actuator. The rest of the structure is just sticks and pieces. The

wing is simple too: Just put down a 1/16"x6" sheet, glue the rib formers to it along with the leading edge, and later glue the 1/16" top sheeting in place. I'd say that the total effort involved was little more than that required for that A R F plastic model I mentioned earlier.

Aside from its profile shape, the most unusual thing about the MINI-OT design is the method of connecting the actuator to the rudder. Rather than a push rod or torque rod, this system employs a rocker arm or bellcrank driven by the actuator, and threads carry the action back to a pair of horns on the rudder. The scheme is illustrated by Figure O which is taken from the plans. The advantage of this is that it offers a minimum of weight at the rear of the plane, with a consequent minimum of weight needed later in the nose to achieve the proper C.G.

A couple of hints about this type installation. I made the rocker arm out of polystyrene plastic using the lid of a box such as that in which small engines and actuators are sold. Then, using plastic model cement, I fastened a spacer on either side of the center to make a relatively thick center section. A 1/16" hole was bored in the center, and 1/16" piano wire used for the pivot. The result was that the arm would turn freely without twisting or any

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JAY P. CLEVELAND, Publisher

tendency to bind.

Tension on the two threads should be only just enough to keep them straight. This will be easy to set up if you tie the threads first to the rudder horns and then run them both through their holes in the rocker arm, whereupon a couple of dabs of plastic cement will hold the threads in place without having to fashion a knot and maintain tension at the same time. Do not use nylon thread, which seems to expand and contract with temperature and humidity; dacron is recommended on the plans.

One thing missing on the plans is any reference to the fact that an Adams actuator needs to have stops to limit its throw. While the manufacturer says the throw should be limited to plus or minus 35 degrees, my experience is that it is better to limit it to about plus or minus 20 degrees. There is a little arm fastened to the Adams magnet which makes it easy to make up the necessary stops.

Two other notes of caution will be mentioned quickly. One, make sure the left and right of your rudder correspond to the motion of the control stick; on mine it was necessary to reverse the brown and blue wires on the actuator to make things come out right. Two, when the battery cells are mounted side by side, be sure that the rims do not touch or else there will be a short circuit; a piece of adhesive tape around the rim of one cell takes care of it.

If you've ever trimmed out a small RO ship, you know I would be kidding if I tried to say it flew right off the board. Actually, half the fun of this type model is fooling around with the incidence angle, C.G., thrust, etc. The main thing I found was that on a ship as light as this—it weighs only 9 oz. complete—the wing incidence must be kept small to prevent ballooning. I wound up with 1/16" incidence rather than 3/16" as called for. Also I had to add about 1/4 oz. in the nose and move the wing back about 1/4" to get the C.G. near where it belongs.

In the process it also became evident that the single 1/16" wire for the landing gear needed strengthening, so I added a second 1/16" wire member.

Flying the small R/O plane is, of course, quite a different thing than the point-and-shoot technique needed for the zero-zero trimmed multi ships. You have to go back to the old tricks of keeping track of speed etc. Most of the time, however, the MINI-OT flies gently and gracefully, and I found that the proportional action of the ACE transmitter (as opposed to the old right and left button setup I used to have) added considerably to the smoothness of the flight.


One flying characteristic gave some food for thought. When it stalls, my model tends to fall off quite sharply on one wing, as though headed for a spin. This seems to be due to the extra area near the wing tips represented by the fake aileron tabs. And, it seems to me, it provides a message to today's modeler—that back in 1910 those ships they flew probably were pretty unstable. They knew practically nothing about spins and how to avoid them. It undoubtedly was not only adventuresome but downright risky to crawl into those contraptions and make them fly. Think of those adventurers as your .02 snarls to life and the little plane lifts into the dusk. . .

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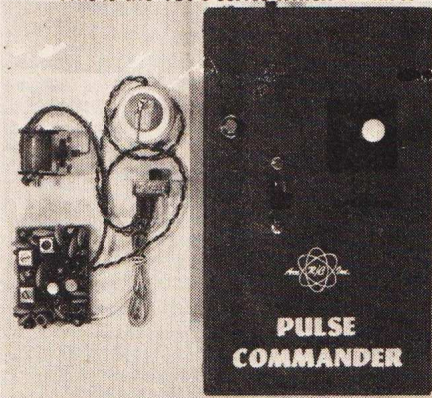
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