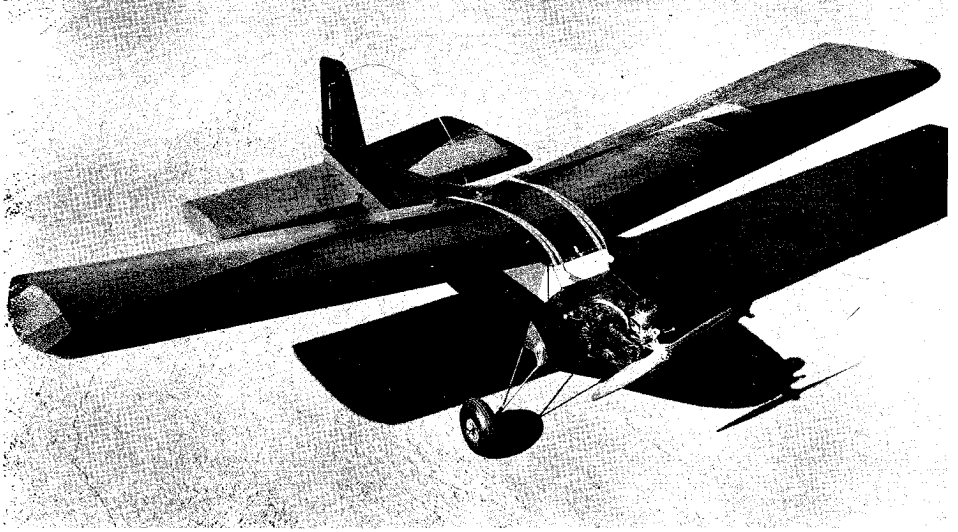
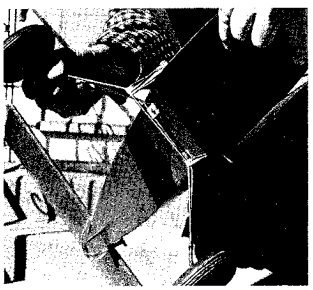


Functional, practical design minimizes fussing on the field and the irritating business of trying to get into inaccessible places.

GRAMPS

Knock off long, lazy hops with this practical RC ship for 19's. Excellent for beginners—or jangled nerves.



Two metal strap fittings pivot rear gear V. Rubber shock cords over dowels to front V.

► This is a pleasant-to-fly, easy to-build rudder airplane built for .19 power. It is an ideal sport job for anyone who finds the .09 planes too small or too underpowered for his taste. Because of its many very high, leisurely flights, the ship was dubbed "Gramps." Originally constructed as a test vehicle for advertised radio equipment, Gramps proved itself a machine worth reader attention. It has flown without difficulty, including landing nearby, in a 25 mph wind with gusts to 35 mph.

During the winter of 1955-56, an .09 Rebel was constructed to test various two-tube receivers. About that time vagaries in the gas tubes themselves led to substitution of a hard-tube receiver, which happened to be the Citizen-Ship kit, as shown in pictures last month. The Rebel proved to have noteworthy characteristics. For one thing, the upslanted, flat-bottomed nose, minimized broken props, the cost of which is the busy flier's biggest expense, more so than batteries. The combination of a Lorenz MOPA transmitter (supplied for the tests by Essco) and the receiver led to high flights during which the transmitter was shut off and the plane allowed to soar. Eventually, the Rebel was adjusted a bit like a free flight, with left on power, and right in the glide, for thermal riding. Then bigger batteries became desirable.

A very approximate scale-up of the Rebel was

Rebel ancestry here apparent. Wing should be strapped on with several long rubber loops. So you use one loop—what if it breaks?

Nothing like an upright engine for easy starting and trouble-free, cool running. Ship is big enough to carry any radio, batteries.

used to make Gramps. There was no plan, the ship being made "in air", so to speak. Many flights were made with a K-45 battery and three intermediate flash light cells, two on the Babcock Mark 2 escapement and one for filament. But flights grew ever longer so the three intermediates were increased to six, which the ship carries without difficulty. In fact, the glide is more penetrating and efficient. One almost never has to change batteries and, regardless of the number and length of flights, can fly for many weeks before a drop of even one-tenth is noted on the filament.

Anyone who can build an RC model has no need of directions, especially since materials are noted on the plan, which is available full size. However, a few background facts are interesting.

The ship is so designed that with a .19 engine and a sport fuel, a high altitude will be reached slowly on about an ounce of fuel. This was true of the Veco .19, which seemed to be unusually economical. A two-ounce tank gives a very long flight with at least two spin-downs necessary to avoid climbing out the top. The props were 11-4's and 10-5's. The former is a bit the lazier. Even in a nose-light, nose-up position, the plane will complete 360's under the power once the turn is established. On a hotter fuel, with faster climb, however, the ship will break out of the turn, once begun, before 360, and resume climbing straight-away, unless the rudder is held long enough to put the nose down into a racing turn.

If trimmed tail heavy, Gramps will hang almost motionless in the glide but will not swoop off, out of the wind. It is better, of course, to have a faster glide because tip-stalls, on a gusty day, frequently cause what looks like an interference spiral which may make more than a full turn before opposite rudder effects a save. Unlike the Live Wire, to which Gramps is a distant cousin, due to its Rebel inspiration, this ship cannot be rocked back and forth near the ground before touch-down to affect a flare out. The amount of dihedral prevents yawing. If a flare-out on rudder is desired, a slight turn has to be started about 6 to 8 feet off the ground, then opposite rudder applied and held. Due to designed-in down-thrust (not apparent to the eye), resulting from the positive angle of both wing and tail, the launch is apt to go out flat. Therefore, as is true of any such ship, a lower pitch prop, such as a 10⅝ or an 11-3, may pull the ship into the ground before the wing lift builds up with increasing air speed. Low pitches are for the birds anyway, since, after a nose-down launch the climb tends to become mushy and the plane "drops dead." If the launch can be affected with a moderate pitch, the rest of the flight is lighter on its feet, and not so locked into rigid grooves. This is not ideal for all manner of stunts but we are talking here of a sport ship not expected to stunt.

Materials and covering are of the strongest. The ship is extremely strong. For rudder only, some weight can be wasted (from the multi man's point of view) for sturdier frame and bigger batteries. Heavy nylon was used throughout with six coats of aircraft butyrate plasticized with six drops of castor to the ounce, followed by three coats of colored butyrate. Color scheme was red and blue.

Battery packs with soldered cable-and-plug leads were used. With big batteries there is no replacement problem—besides a spare set, cable and all, can be carried. If you use boxes, it is suggested that, if possible, the top nose opening be made bigger, and the boxes arranged on a vertical sliding tray, the box bottoms forward. If placed under a false floor in the cabin, retrimming is necessary. If you use metal boxes, be absolutely certain to wrap rubber bands around the boxes or to spring load the ends for a reliable contact under vibration. Wing hold dowels are extra thick. Quarter-inch thick dowels simply are not dependable in pull outs, especially after oil soaking. The rubber weather-stripping applied around the cabin edges was fastened with Pliobond. This keeps out dirt and exhaust fumes, helps prevent wing shifting and rattling. The facing-front dowels through the windshield are far better than a dowel across the top front of the cabin, which like as not, will rip up the bulkhead in a crash. The shock gear was the second on the plane—others have used it, so Gramps borrowed the idea. Wheel position is back far enough to encourage experiments with take-offs.

Wing loading is 16 oz. per square foot and power loading is 420 oz. The power is adequate.

In the side view, the front cabin former may seem confusing. The main bulkhead is ¼" sheet as always. But, due to position of the front wing hold-on dowels, it is impractical to drop in a wide receiver slide when the receiver is mounted vertically—the dowel thickness would be cut away more than desirable. So, a second bulkhead, made of ⅛" sheet, is constructed behind the main bulkhead and separated from it by ¼"x½" filler strips. The only reason for this second bulkhead is that, in the unlikely event of a hard, vertical crack-up, the receiver slide is supported evenly. Otherwise, weighty objects, as the relay, would crack the slide and, once in motion, perhaps break the main bulkhead as well.

The battery cable is twisted from #24 stranded wire. A hole is made near the bottom of the main cabin bulkhead, near one side, so that the plug can be led into the cabin and to the socket. The receiver tray should not extend to the cabin floor—this leaves open the special hole for the battery cable.

The builder may substitute wood torque rod to move the rudder. If metal is used as on plan, solder a thin piece of flexible wire, in a half loop, between the rod and the contact on the escapement that is connected to the frame. It probably isn't necessary, but is a precaution, to slip some non-metallic covering over the linkage arm at the rear of the plane where it goes through the rudder yoke. On long flights you can build your own interference with rattling metal parts, especially on hard-tube receivers. This effect is especially pronounced where control impulses are few and far between.