Small size of the plane makes it easy to launch while holding a transmitter. This particular ship was equipped with an Aerotrol, though designed for McNabb, others, as well. Bernie Spira makes the launch.

WE TEST THE LIVE WIRE

▼

Planned for beginner and the sport flier, the DeBolt designed .09 job will accommodate any one-tube receivers on market. Prefabricated, and good flier.

▶ DMECO's *Live Wire* rc trainer for .09 engines is the first kit designed expressly for radio work without consideration of the requirements for other kinds of flying as well. It is interesting, therefore, to review one manufacturer's evaluation of the problems of the rc flier and how the design fulfills its purpose.

The *Live Wire* is a trainer. In a way, it is the equivalent of the profile trainer in U-control with the exception that its abilities in remote control flying are not so limited. Because radio is now in the stage where thousands of otherwise experienced modelers find themselves beginners all over again, the decision to make a trainer appears to be a wise one. What constitutes a trainer?

Obviously, it should be simple to build, operate, and fly. It should be reasonably small for many reasons, including an ability to bounce unharmed through most crack-ups, easy repairs, minimum investment of money and time, and general ease of flying. More explicitly, it should be capable of good flight in moderate winds, have no violent reactions or recoveries from various maneuvers, no tendency to balloon out of turns made into the wind, and require no tricky adjustments. It should be maneuverable but without hair trigger responses. To check flying characteristics, one *Live Wire* was built for this report and several, belonging to different builders, were flown under various conditions including winds of approximately 15 mph.

As may be seen from the pictures and the three-view, the *Live Wire* is an extremely chunky, compact machine. This reflects the U-control experience, both as flier and manufacturer, of its designer, Harold DeBolt. It is also due to the fact that the design had to take any one-tube radio now on the market. The combination of the McNabb unit and an .09 airplane cabin, inevitably resulted in an unusually large cross section for such a small airplane. This large cross section did have the desirable affect of lowering the side area and the belly so that a short, dural sheet landing gear could be employed as on team racers. The gear is screwed to a 1/4" hardwood block that is cemented between two adjacent bulkheads. An interesting modification observed on the field utilizes a long 3/32" music wire axle which extends through both legs, and which is fastened to the hardwood block at the center by means of a single J-bolt. It was found that the deep nose saves props as the ship oftens slides on nose and wheels. Use of a short gear markedly reduces "flip overs" after landings on rough ground.

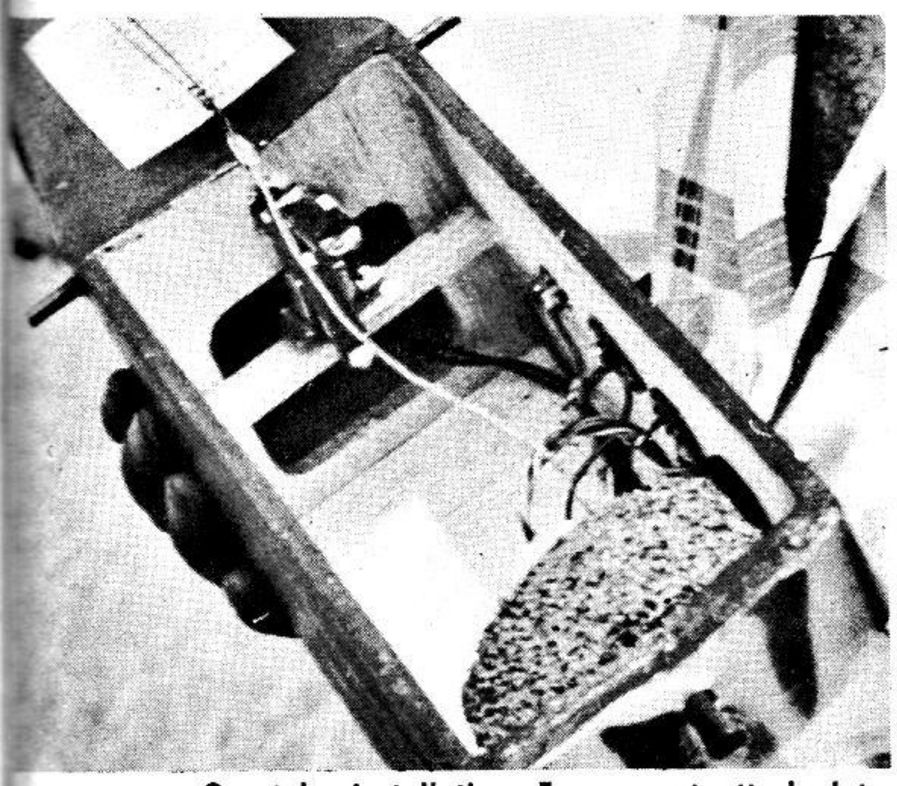
In profile, the *Live Wire* suggests the *Rudder Bug,* having a high thrust line; sharply swept-down rear fuselage, so that the thrust line passes roughly through the middle of the fin; a bottom-mounted, detachable stabilizer; and vertical tail permanently affixed to the fuselage. Like the *Bug,* the *Live Wire* has the same definite tendency to fly straight without thrust line adjustments. However, the *Live Wire* does have downthrust, although it is not apparent. DeBolt placed positive in both wing and tail, but, nevertheless, preserved sufficient longitudinal dihedral or angular difference to allow an ample stability reserve, despite the over zealous shim-trimming of stabs that builders sometimes resort to.

The construction of the fuselage is almost entirely sheet balsa. The sides are comprised of three butt-jointed sheets with seven former stations, including the firewall. The bottom is flat, which permits erection of the whole upon the bottom sheeting just as a crutch sometimes is used as backbone or foundation in free flight types. The wing and stabilizer are built up, the former having one spar and the latter none. A moderate amount of dihedral is used. Also, the high point of the camber is at 50 percent of the chord. Both are important points.

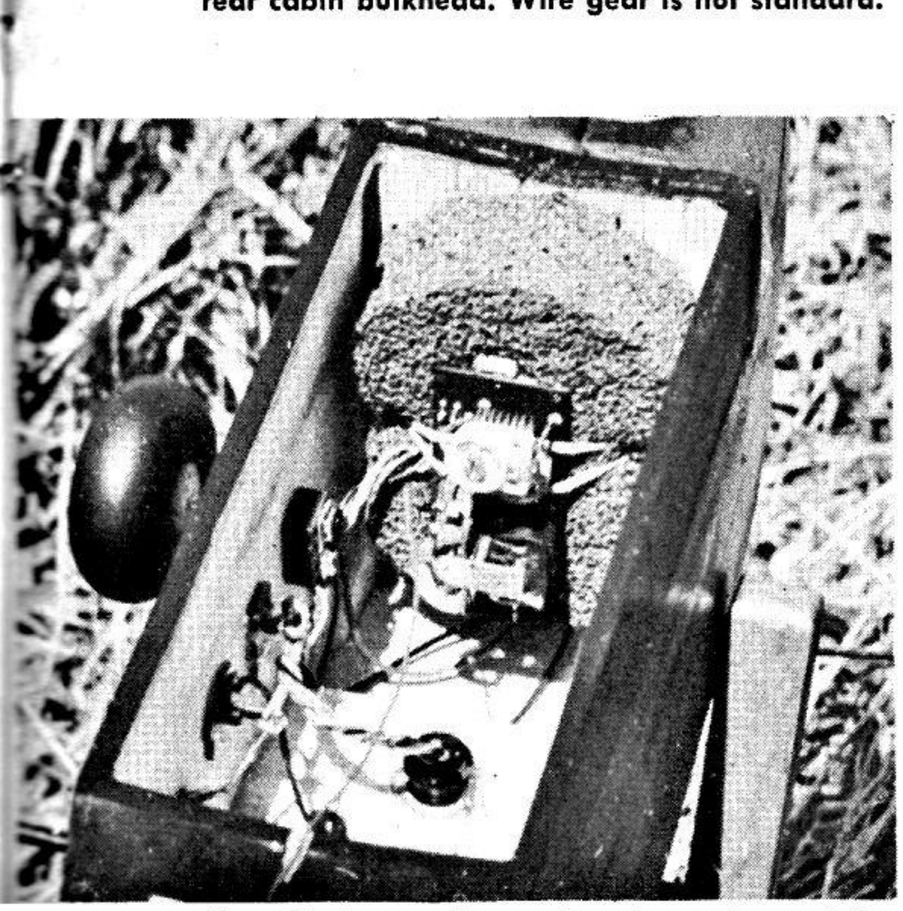
Dihedral is a key to radio design. Its principal affect on flying ability is the speed of recovery from a wing low position. Large dihedral produces an abrupt recovery when signal on is relaxed, so that the ship rocks violently back to level flight. As the flier becomes more proficient and begins to apply repeated double signals on self neutralizing escapements (the most common, by the way), to maintain a continued turn in one direction without a spiral dive, excessive dihedral will cause the plane to rock in and out of the turn in a disturbing, unsightly fashion. Too shallow dihedral, of course, has the opposite affect, as the plane tends to stay in turns without recovery or actually begins to wind down unless taken out of the turn by radio. The correct compromise gives smooth turns without spiral dives—unless rudder is held on—and without automatic rocking out to level flight. (*Continued on page* 38)

Single-spar wing is knock-off in crash, ties on with rubber looped over two rear, one front, dowels. Stabilizer detachable, ties in place under fuselage. Team racer gear.

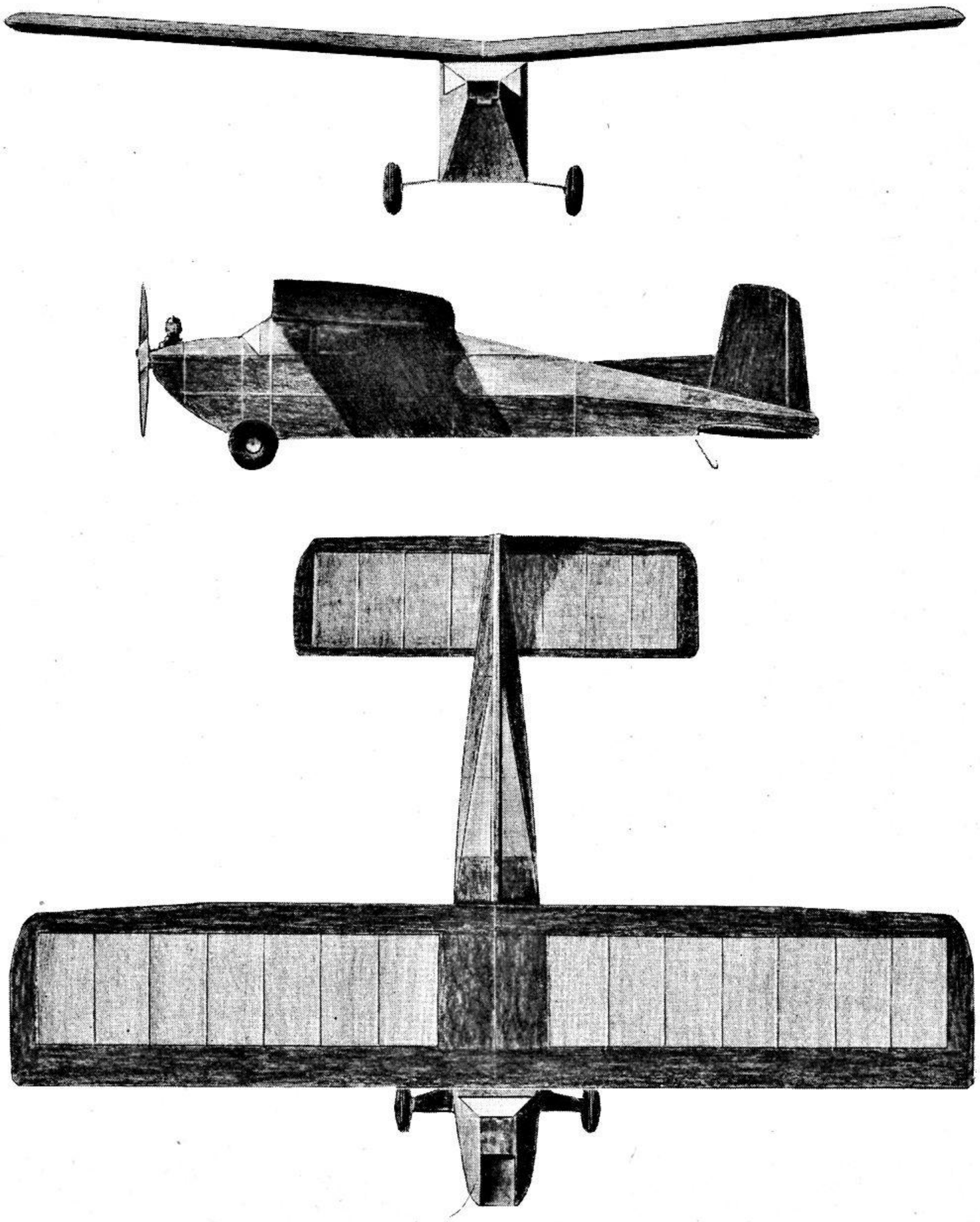
Starting an .08 Mills version. Test job flew well with McCoy 9 and an 8 x 6 propeller. Deep nose and a short gear combine to save props; "few flip overs." Fuse is sheeted.



Gas tube installation. Escapement attached to rear cabin bulkhead. Wire gear is not standard.



One-sided gas tube receiver in crash-proof installation. Plan gives details for the McNabb.



We Test The Live Wire

(Continued from page 20)

On our test *Live Wire*, it was found that the turn could be established and the signal then relaxed, with the ship tending to continue on around for as much as a 720 in either direction. It will be found, as a rule, that a ship will tend to recover from such a turn more quickly to the left, and to the right may actually lose altitude. (Also, radio jobs usually make so called spins more easily to the right than to the left—which should embarrass the rules makers.) This was a plane in perfect adjustment. The ship will recover, taking itself out of an "automatic" turn more quickly from whichever side is opposite to any natural built-in turn. The use of straight dihedral tends to minimize rocking recoveries, reduces roll outs at the top of loop attempts, and tip stalling.

The position of the high camber point is directly related to windy weather ability. According to Dmeco, early *Live Wire* had a tendency to zoom into the wind. At that time, an airfoil was used which had the high camber point well forward. When this high point was shifted to approximately 50 percent of the chord, performance immediately improved.

Judging by its performance, the combination of power, size, and weight is about correct for sport flying and beginner work. Other things being equal, an .09 job is apt to be hot and hard to fly when the area goes below 400 square inches, and becomes marginal when the area approaches 475 square inches. The *Live Wire,* with 435 square inches, is a good compromise. However, much depends on how the plane is built. One flown in the tests behaved excellently on a McCoy 9 with an 8x6 prop but, with a lightweight Aerotrol installation using hearing aids for B supply and a single pencell for A supply. This single pencell did provide two afternoons of steady flying on fairly long flights but is not recommended.

Built according to the plans, the *Live Wire* features a sturdy "cage," a built up framework which supports the McNabb radio complete with space for 12 pencells. DeBolt states that over 70 flights have been made on such a battery set-up. The degrees of performance with this installation depends on the condition of the .09. A good engine will do the job. The new Cub .14 should give adequate power for any weight, probably too much for any lightweight installation, with a beginner on the button. The "cage" fits snugly within the cabin and is removed with radio and batteries in place for any bench testing. The cabin is so large—always good in radio—that other units may be mounted in almost any fashion. Receivers may be slung from four hooks firmly attached to the corners, with batteries on the floor or in special boxes against the front cabin bulkhead. This large bulkhead makes an ideal location for the gas tube receivers (built on one side of the chassis) which can be mounted loosely on sponge or foam (rigid installations invite vibration of the relay armature) and placed flat against the bulkhead. Such an arrangement makes it impossible to damage the radio, regardless of the severity of crack-up.

It is hard to recommend any given amount of rudder response for the beginner. Usually, slight control is recommended in order to prevent unexpected steep power turns that strike the ground. More adept fliers prefer really positive control in order to turn the plane either direction under any circumstance, and to turn the ship away from a threatening stall. Very slight control prevents turning away from a developing accidental stall. This is something for the flier to experiment with. Various *Live Wires* were flown with different amounts of control for these observations and it was found that, with enough rudder response, the ship can be turned either way as it

begins a zoom after a dive, converting what would become a stall into a graceful wingover. Steady engine running is difficult to achieve in rc due to prolonged nose-down or nose-up altitudes which cause failures. The *Live Wire* minimizes failures by use of a wedge tank set wedge downward with vents placed on the opposite side.

Also of benefit to the beginner is the near sameness of flying speed, both under power and in the glide, which means that control response produces roughly the same size turns in both conditions. If the power speed is excessive, control response with engine running is thrilling with the amount of action that must be kept as a minimum for good glide control. The rather large drag of the plane contributes to this desirable sameness of speeds. It is surprising that the ship makes good headway into a good wind without getting much altitude.

The builder would do well to experiment with cg position. A fast glide will generally benefit the performance of any rc. It is suggested that any nose down corrections that need be made, be accomplished with shims between the stab leading edge and the fuselage, to impart more negative incidence to that surface. But, while the opposite is practiced to increase the nose-down movement, it may be found that it is far better to avoid excessive corrections in this direction by these means, rather adding some ballast to the nose, as when windy weather creates tail heaviness. Positive in the tail will appear to make a machine fly flatter but it reduces resistance to stall build-ups and often defeats its purpose.

The kit itself is deserving of comment. Materials are of excellent quality. The hardware is exceptional, including the Cessna type gear, the control horn with various holes for adjustment and the linkage parts to convert action of a cabin-mounted escapement into fore and aft movement of a pushrod. Wing ribs are cut out and notched, while the stabilizer ribs are die cut and need only to be pressed out. Bulkheads are cut to proper dimensions. The nose block is 75 percent shaped.

In summation, the *Live Wire* is both a good kit and a good airplane for beginner and sport flier. Only objectionable feature is the vulnerability of the bottom of the nose to breakage on striking objects, such as stones or posts. This can be easily remedied by any builder. This test report, however, should not be considered to rate the *Live Wire* over other rc kits on the market. Space permits reviewing only one rc kit, in fairness, therefore, it is necessary to emphasize that other good kits are available.