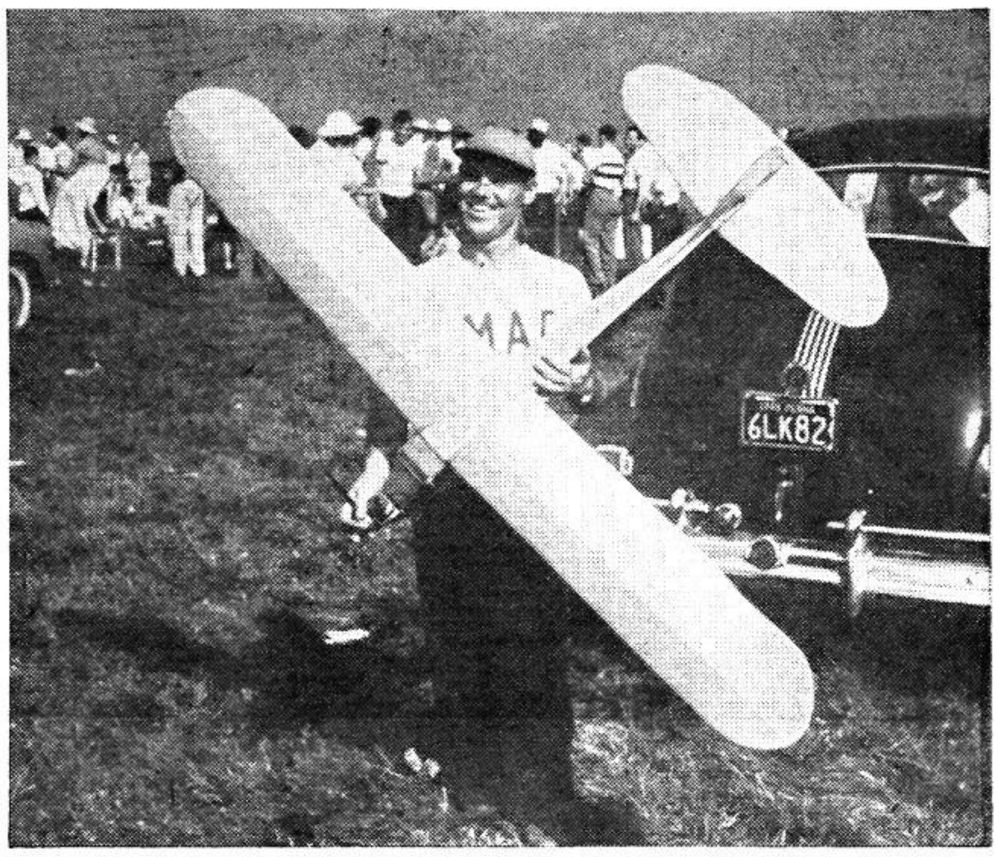
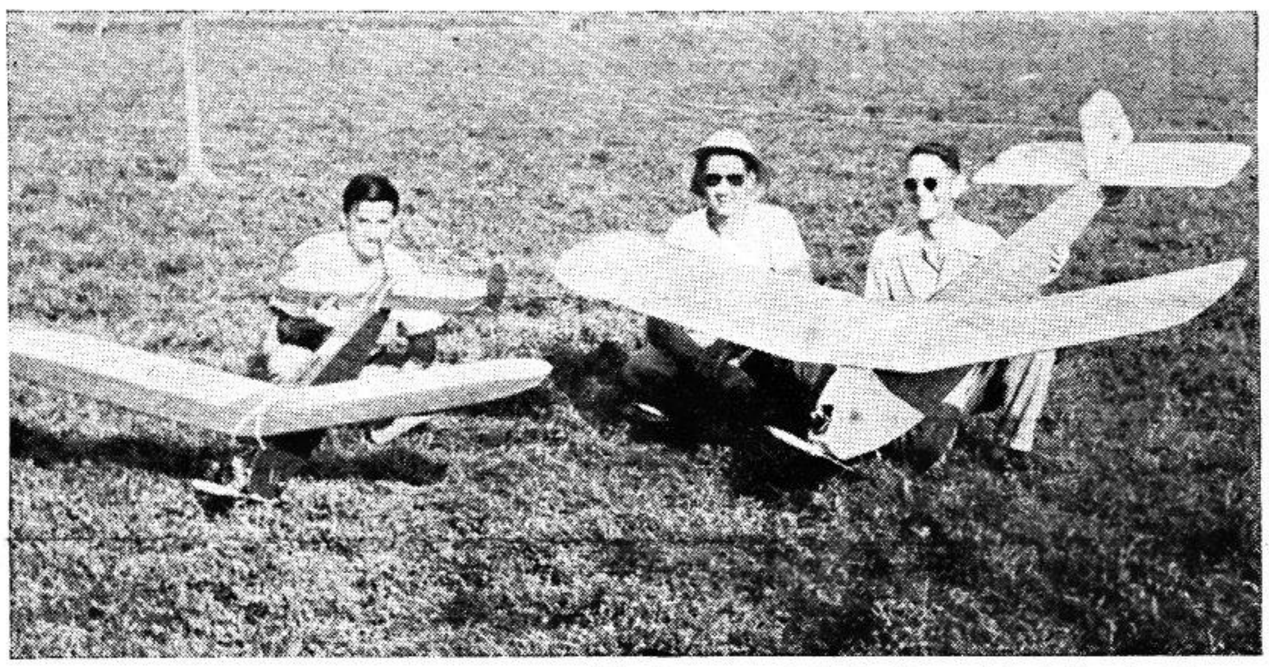
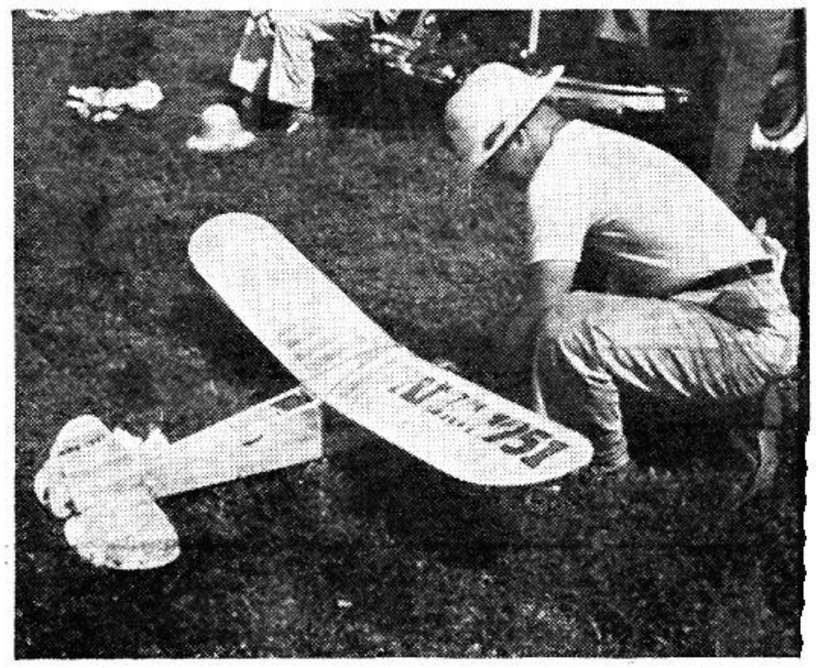
Jim Walker and his '48 Nats R. C. winner—it even has working ailerons!



George Trammell holds his second place winner



E. Foxworthy with twin tail job; team of L. Brown and J. Hughes with their big ship



Leon Schulman flew Fran McElwees' *Drone*-powered plan

Championship

by H. H. Owbridge

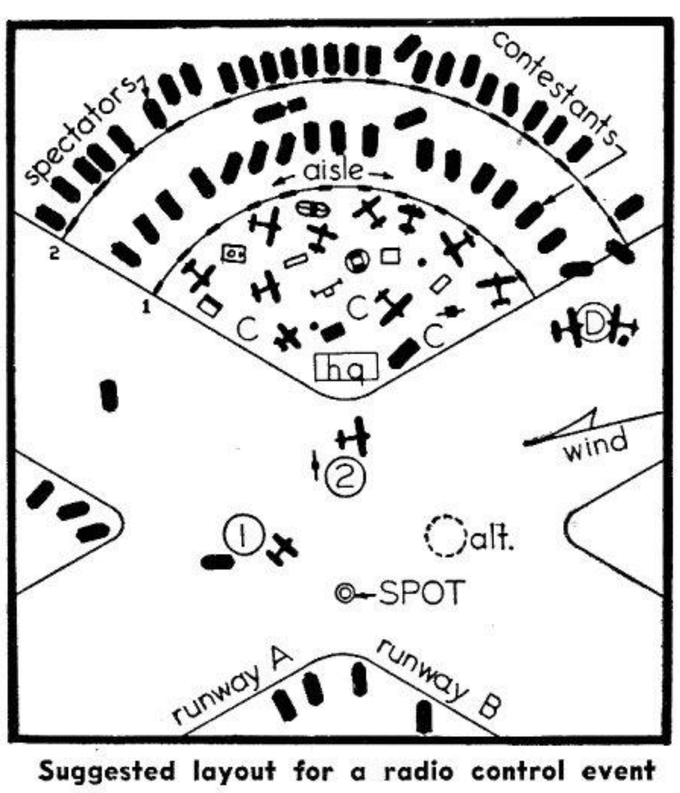
Study these observations made by a contestant at the 1948 Nationals R. C. Event

THIS is a one man discussion of what happened at the 1948 A.M.A. Nationals Radio Control Contest. It is the opinion of a contestant who participated in the event for the first time. Actually a round table discussion by all contestants would give a much broader picture of what took place, especially if it included those who had entered the event more than once in the past years. A crossection of the opinions of all the contestants scattered throughout the U.S. would be difficult to obtain, so, without regard to how far our neck protrudes and with apologies ready for any misrepresentations (which will be small at most), here goes.

First, the points of praise. These are many. All contestants will generally agree that the contest was very near perfect. It is a great event, a beautiful sport, and it cannot fail to be even more so in the future. The sharp increase in entries over past years indicate the trend. The flying site (Naval Air Station, Olathe, Kans.) could not be bettered. Clean concrete runways, soft fields of clover (and very friendly grasshoppers!), no dust, and a Navy that cooperated to the extent where a contestant might feel model aeronautics was just about the most important activity in the U.S. The latter statement can be made just as strongly for the A.M.A. and the Olathe Post of the American Legion. Contest direction and judging of the event were very well handled. The three Navy flyers who acted as R.C. judges were very conscientious and fair.

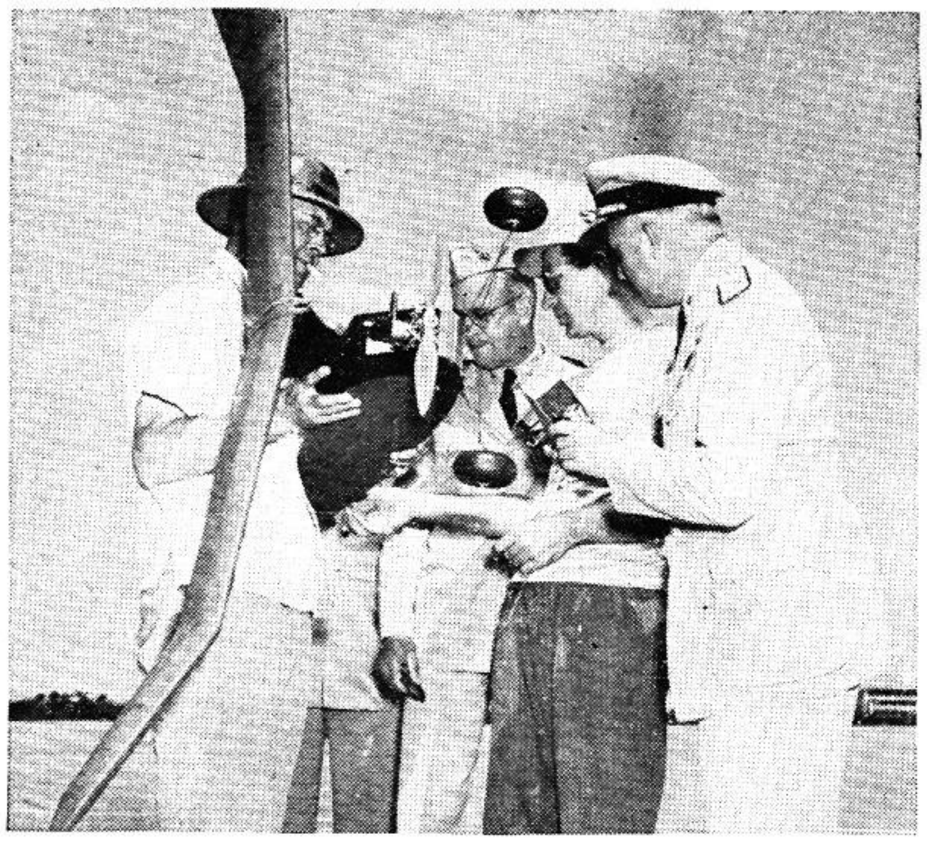
So much for the good points of the contest. Now let's be only human and pick out the points where improvement can be made in the future.

The spectators were a problem. They always are a problem—but you can't just send them home. The public must always be considered in any mass outdoor gathering. Also, the national contest must be advertised, witnessed and appreciated to insure public support. Not all the trouble the contest directors had in controlling the spectators was the fault of the spectators themselves. Much of it was due to the way the contestants distributed themselves around R.C. headquarters tent. Contestants drove their cars into a space just off the runway and to the left of the headquarters tent, and proceeded to check out their ships beside their cars. This practice left the contestants spread out for some 200 feet to one side of the headquarters tent, with plenty of extra space between each car. When spectators come to see something they don't stop coming until they are as close to what they want to see as possible. When they spied all

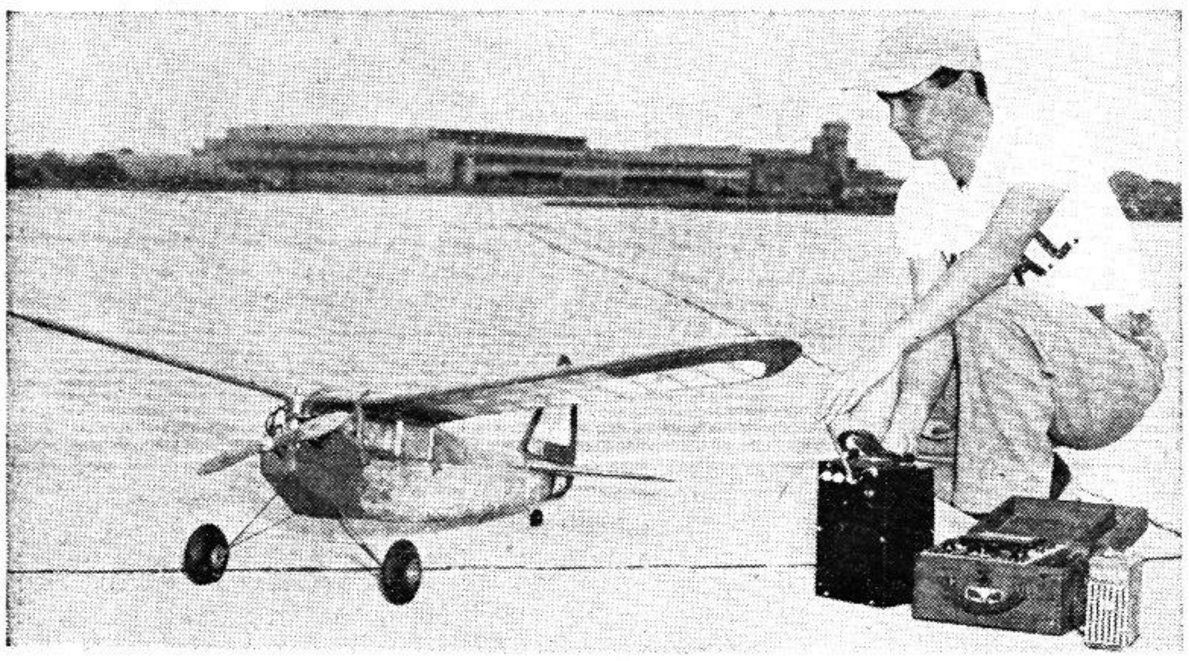


Suggested layout for a radio control event

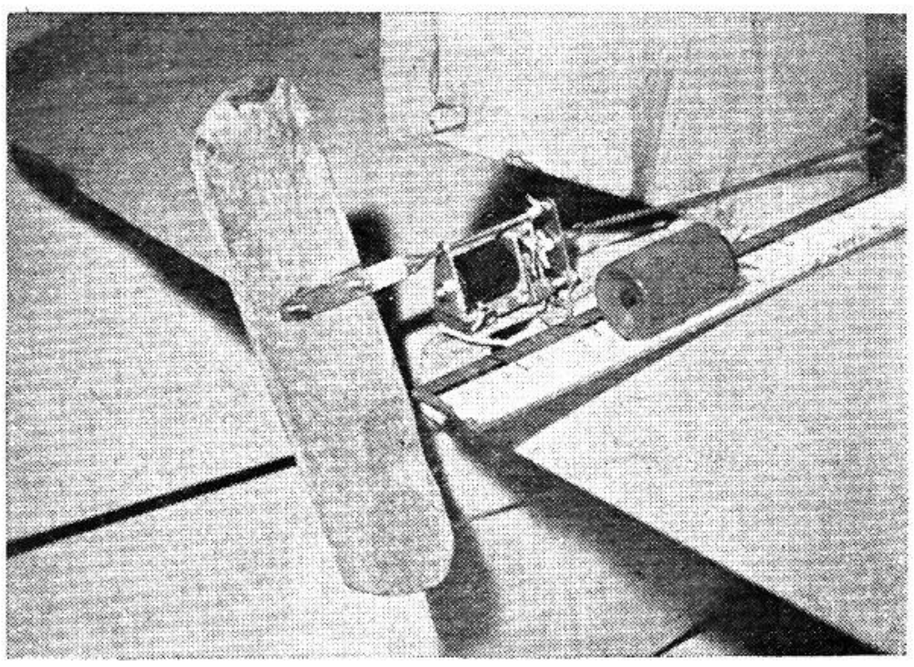
Lt. (jg.) G. W. Denby, at left, and Ens. R. O. Bottum were very popular judges



June Pierce. radio CD, Adm. Whitehead, Lanzo, Capt. Hungate



Flt. Lt. E. J. Lisle, RAF, on duty at Keesler Field, Miss. was a contestant



Latest *Rudevator* installed—round object is thermal cutout

Radio Control

the unused space between the contestants' cars they simply figured there was plenty of space left for a few more people. So they stepped over the rope barricade and thus gained their much desired closer look at the airplanes.

This situation is difficult to prevent without the added and impractical expense of fences, policemen, and even bleachers. One suggestion is offered that might be worth a try at the next Nationals. The main catch is that all contestants must agree to cooperate to give it a fair try. The suggestion calls for tactics similar to those used by our forebears who crossed the plains of America in the covered wagon when they prepared for an attack by hostile Indians. In short, form a barricade of contestants to discourage the onslaught of spectators.

Fig. 1 will help to clarify. This drawing shows the intersection of two runways, as would be available at the Nationals. It should work just as well with only one runway or any other good line of demarcation. The contest directors headquarters (HQ) is located just off the runways at the intersection. Two rope barricades (1 and 2) are run in a partial circle as shown. Contestants' cars, along with the cars of contest directors, helpers, etc. should be parked 6 to 10 feet back from rope barrier No. 1 and all contestants should cooperate by setting their ships and equipment inside this barrier in the contestants space C. The space between barrier No. 1 and the contestants' cars is intended as a broad enough aisle for spectators to walk in to view the ships. The closer the ships are parked to the rope barrier, the less will be the tendency for spectators to come into contestants space C (we hope). They will be further discouraged if space C is not too large, but just comfortably filled with contestants' equipment. A wide enough "road" should be maintained between contestants' cars and barrier No. 2 to provide for passage of contestants' cars in and out of the area.

Naturally this will require one or more persons assigned to the control of parking. At the Nationals the control of spectators and where they parked their cars was a constant headache to those in charge. It seems that almost half of the P.A. announcements were orders bellowed at some non-cooperating (or confused) spectator either on foot or in a car. The layout suggested here is believed to offer advantages of crowd control without the undue expense of fenced areas, bleachers, or a large personnel assigned to policing the contest site. The two points of theory to keep in mind are: (1) Keep the contestants and their equipment in a well grouped area large enough for their own activities but small enough to discourage the mass entrance of spectators; (2) Place the airplanes (or as many of them as possible) near enough to the spectators barrier so that the onlookers can get an eyeful without the urge to cross the barrier.

Now there are other advantages that fall right in line with this theory. At the 1948 Nationals, communication between contest directors and contestants was quite poor. The above layout keeps the contestants within easy talking range of headquarters. It eliminates considerable confusion and unnecessary P.A. messages (such as occurred at the Nationals) as to "Where's so and so?" "Is he going to fly?" "Oh, he already flew." 'Well, what's his name is up next, is he ready?" etc. Jim Walker can chuckle at this—he came equipped with his own private P.A. system and could bellow back across the fields. The rest of us had to make the trip on foot.

Another advantage is that the P.A. speakers could be turned away from the contestants and directed toward the crowd for whom they do the most good. Very little comes out of a contest loud

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Championship Radio Control

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speaker that a contestant is really interested in. Harry Geyer of Beacon Electronics will remember how we kidded the contest directors into shutting off the P.A. during an official flight, "because the emission might effect the contestant's receiver." Well, we had to think of something. Those loud speakers could get on a contestant's nerves in his weakened condition.

Now for the problem of controlling radio signals to prevent mutual interference between contestants. The system at the Nationals of a red flag to clear the air for a contestant's official flight, and a green flag to indicate "everybody's air," was a good try but not too satisfactory. Allow a suggestion on that. Two flight circles (or spot markers) could be located approximately as shown in Fig. 1. The simple rules would be as follows:

1. A contestant performing an official flight will move to *either* circle (marked 1 and 2) *with* his transmitter and have top air priority and 5 minutes in which to become airborne. A car is permitted at the circle if necessary.

2. The contestant next in line must occupy the alternate circle within the official flight time of the first contestant or forfeit his turn in line for his official flight. The contest director may extend the time to not more than 10 minutes beyond the official flight time of the first contestant, if circumstances so dictate.

3. After the first contestant lands or fails to fly, the second contestant is allotted 5 minutes to become airborne. The contest director may extend this time not more than 5 additional minutes if circumstances so dictate.

4. Contestants who wish exclusive use of the air for ground or flight test purposes must wait until either circle is not needed for the use of an official flight.

5. If neither circle is needed or occupied for an official flight or test, the air is free to all contestants.

6. It is the duty of the judges and contest directors to see that neither circle is occupied without the use or intended use of a transmitter.

The advantages of the two circle system should be obvious. It will keep the contest moving along since contestants can see by a glance at the circles just who is up, who is next and if necessary make ready. Air priority is determined automatically by viewing the circles and no flags or other signals are necessary. Spectators know where to stand to view the takeoffs and landings without milling all over the field. It is not necessary for a contestant to release his ship from within the circle but at least *he* should be there. Alternate circles or spots (marked "alt.") could be provided in case of an important wind shift. Judges would not have to run themselves ragged from one place to another depending on where so and so decides he would like to take off.

One more major problem remains. A drone circle D is needed downwind of the contest site, in which all ground testing of engines is to be done. With all contestants in space C, engine noise so close to HQ could soon spoil the whole plan.

So there it is in brief. Details can be filled in as needed. As radio control contests get bigger, some system such as this must be resorted to. No doubt the idea can be improved still further. Let's argue.

Now for a brief review of some of the contestants at the 48 Nats and their ships. Being a contestant myself—and for the first time—I was far from being as relaxed as one might be if he were merely reporting the event. Consequently some contestants and their ships and problems were not thoroughly met. Some 21 contestants signed up, 18 showed and 16 flew.

Top man of course was Jim Walker with a very realistic red job of about 8 ft. spread, and 8 lbs. The control, which he calls the *Pozzipo,* responds to a carrier wave of several selective time duration intervals. He can get right or left rudder and up or down elevator in movements of one-third, two-thirds or full. Two-speed motor and motor cutoff are also included. It is really a beautiful system and provides a high quality of controlled flight. Jim (among others) demonstrated that a radio controlled job can be built so that it is nearly indestructible. In one of his sloppier moments (which practically all of us had) his ship spiraled smack into the concrete runway. There must have been a lot of mixed feelings among contestants that the bigtime operator in radio control was out of the running but that it was regrettable any top contestant should get such a bad break. We all got fooled though. In a matter of hours the ship was repaired, dried and back in the contest. What workers Jim and his assistant Johnny are!

Second place was won by George Trammell with his selective pulse-length control. This control and its magnetic actuators were described in the June 1947 issue of this magazine. He had rudder and elevator control (two carrier waves) which responded to the difference in time a carrier wave was on the air, as compared to the time it was off the air, in a given short time interval. This control also gave a high degree of maneuverability. Consecutive loops were apparently an easy matter and Trammell was plenty sharp on his spot landings. His first official flight was one of the high spots of the R.C. event.

Third place went to E. R. Foxworthy with a standard Good Bros. escapement actuating twin rudders. This ship had a rather low degree of maneuverability but was the smoothest flying airplane in the event. He used fixed wing slots which may have had a lot to do with it. If you've ever seen a seagull just cruising, that's it. Almost no excess speed when recovering from a turn; made you want to just lie down in the grass and watch it fly. Foxworthy also made the closest spot landing of the meet.

In fourth place was L. V. Brown with a ship that flew much like Foxworthy's and had a Good Bros. escapement on a single rudder but with two speed engine control thrown in. A little hard luck (it's part of the contest) landed him in the only lake for miles around. A rowboat got him there just as she was "going down for the last time." After a good sunning the ship was back in the fight.

Fifth place went to Leon Schulman with an Aero-trol set and rudder escapement. Just the straight stuff. Schulman, you did all right—you have contest ability. We haven't—yet. I watched you sweat that ship out on the half mile! Leon had an interesting trick in that one wingtip of his yellow ship was painted bright red —a big help when the model was some distance away and he tried to figure whether she was "coming or going." As another point of interest, one of Leon's ground crew was detailed to rotate the transmitting antenna while the ship

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circled the field, so that the plane would always get the maximum signal.

Now, in 6th place, guess who—us! We gave *Rudevator* its first fling at the Nationals. Not too much on results but some of the most point winning excuses at the meet—except that they didn't allow any. (The fellows from 7th place on down will please pardon me while I talk about our problems.) In the first place our ship was pretty green. It was our latest design and *supposed* to have everything. There wasn't much time to "wring it out" before the contest and the ship turned out to be somewhat difficult to handle. But then, maybe I'm the nervous type. I remember getting pretty badly lost on a distance try. My partner Dick Schumacher (who flies the big stuff for a living) took over much to my embarrassment; he got it back on the beam—but not without difficulty.

The ship was small and short coupled for reasons that were thought to be good at the time. Here is an interesting and sort of confessional observation about *Rudevator* or any other single step control, as compared to a control like Walker's or Trammell's. A single step control must be fitted more closely to the model's flying characteristics than a "true" proportional control. In the latter case the amount of control used for any maneuver can be applied in accordance with the model's requirements for that maneuver. A single step applies all the control at once so the amount of this control must be set on the ground to best fit the model's requirements, and thus produce the desired results. Although Walker's and Trammell's are not true proportional controls they closely approach it. Trammell's approaches proportionality very closely, and Walker's is a triple step affair rather than a single step control, as are the escapements.

The only catch is (and this is what seems hard for the radio control dreamers to understand) that you never get something for nothing. In Walker's case a brain box is needed on the ground to measure out each signal length. In Trammell's, one carrier is needed for each control. All control systems are a compromise; even *Rudevator* presents a pill to be swallowed by the user who wants the three basic controls for the least effort. That pill is the rather unconventional rotary control surface on the tail. Of course for those of us who are *Rudevator* boosters, that is an easy pill to swallow, in exchange for simply turning on and off one carrier to get three controls.

Well, to get on with our problems at the meet—which someone may profit from in the future—we soon found that the positive engine cutoff on *Rudevator* (as described in July '48 M.A.N.) was just N.G. for Nationals contest work. Engine failure at the Nats can mean a lost flight and you only have five officials. So we shunted out the engine cutoff. Next we found we couldn't keep the gas tank feeding in violent maneuvers and our ship was one of the most violent at the contest. Jim Walker helped us out with his balloon tank idea which is the best we have found yet for the problem.

By this time we had lost plenty of points. We had the smallest ship at the meet. On trying for the half mile cross country event we found we couldn't even see the thing well enough at that distance to keep it straight. So small ships are no longer to our liking. Six feet of span seems about right, but no smaller. Last but not least, the high winds aloft caused trouble. We couldn't plow into them

enough to keep the ship within a reasonable distance of the field while we concentrated on maneuvers. In other words we lost too much of our allotted flight time fighting up wind. To dodge the winds we tried to fly too late in the evening. The judges warned us. (We lost the ship in the dark and the field mice took over). Found it again the next day with the help of a real airplane. That put us out of the running. But the ship seems to fly a little better since the field mice removed some of the trailing edges.

Since the wind was not our private trouble but bothered others as well, allow one more suggestion. Wind velocities can be high at any Nationals. Two methods are available to combat it. High speed ships—or more time in the air. Let's not force entrants to build high speed ships so they can best high winds at such contests. Fast ships can't be flown in close to a crowd like present ships, without the possibility of hurting somebody. So let's evolve a simple formula whereby the allotted flight time per official flight is 10 minutes plus say one minute for every three miles of wind velocity at 1000 ft. altitude as determined by the latest report from the nearest weather station. In this way a contestant need only provide enough gas aboard, and slow or fast his ship will have a more equal chance as long as the winds aloft are within reason. Thus a 15 mile wind aloft (which is plenty) will give him 5 extra minutes of flying time to battle it. Another suggestion has been made which may be even better. Allow five flights and/or a total flight time (of say one hour) whichever occurs first.

A final word about *Rudevator*. There was nothing wrong with it at the contest; it just sat there dumb and happy waiting to get on a good ship. Imagine an airplane that wouldn't even loop without rolling out at the top of it! Nuts!! We fixed the engine cutoff problem upon returning home by adding a thermal delay ignition circuit breaker so that the control could go through the cutoff position without affecting the engine, unless given time enough to cut ignition. This idea originated with the Good Bros. Our thermal delay stays open and saves the ignition batteries on the way down. The final *Rudevator* design is shown in Fig. 2 along with the thermal delay unit. A push-button resets the latter. Another advantage of the delay is that the advance ignition circuit no longer has to run back to the tail for cutoff. This means shorter ignition wires and better engine operation in the advance position. The retard ignition circuit still goes back to the tail for two speed switching, but the extra resistance here is less critical at the lower engine speed. As was said, the balloon tank is our best solution to the gas feed problem in violent maneuvers until Walker or someone shows us something better. Now all we have to do is tame that ship down or build a new one with less smarty pants design in it!

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