

SUNDAY FLYER



by Ken Willard

"Hey, what happened to your column?"

"You mean you missed it?"

"Yeah. I thought you were going to come out with a design or something."

"Well, I was but I got outranked by the Nats coverage."

"Oh. OK. But how about last month?"

"The design had a couple of bugs in it, and I wanted to get rid of them for sure before I published it."

"And you did?"

"Yes, but what with vacation — and my wife doesn't like me to work on models then — and getting back into a working mood, I didn't finish the plans. So I'll finish them up and you'll see them next month. Right now I'm reviewing some of the pitfalls — and progress — of the small single channel receivers. Things I've learned to watch out for."

"Sounds good."

That isn't the exact conversation,

but it's pretty typical of several that I've had. So, after checking with our editorial watchdog, I've compiled a few do's and don'ts for you Sunday fliers who've had some troubles with your small transistorized receivers.

First, though, it's interesting to briefly look back and see how we got where we are, and to what end competition among the manufacturers has been responsible.

From the letters I've received, a lot of you sport R/C'ers are old time free fliers who like to keep abreast of R/C developments, but for your own flying your fun comes from stooging around in the sky, and then being able to get your airplane back without running your aging legs off. Many of you have been brought back into the hobby through your sons' interest — and that's great. There should be more of it!

But maybe you remember ten or fifteen years back, when you were out with a free flight, and over in one

corner of the flying field the boys like Howard Bonner, Walt Good, Jack Port, Frank Hoover, Jim Walker, Vern McNabb, Pappy deBolt and other pioneers were struggling to get their radio controlled models airborne. The models were fine — but the radios left a lot to be desired. Nobody was more aware of that than the pioneers themselves — and they did something about it!

The old gas tube receivers gave way to the "two tubers" — like the Deltron, with an RK-61 and IAG-4 operating on a "carrier on, carrier off" basis. For you fellows who've never known anything but a "tone" receiver, such as is universal today, maybe a word of explanation is in order. The "carrier" receivers were basically not in communication with the transmitter unless the transmitter was not only turned on, but the button was pushed, which closed a circuit so that

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the transmitter sent out a "carrier wave." The receiver, although turned on, was not receiving anything, and the old gas tube would be hissing and crackling merrily away until the transmitter emitted a carrier wave. This "quieted" the receiver, and in doing so it also let current pass to the relay, thus providing a control source.

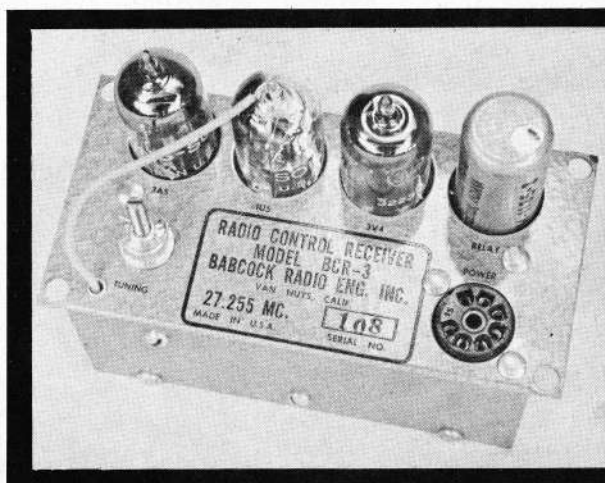
The carrier system worked fine — so long as nobody nearby turned on another carrier! And that was the problem, because other transmitters in the citizens band had to have the carrier on before voice — or tone — could be transmitted.

So Walt Good, with his WAG 3 tuber, and then Babcock, with the 3 tube BCR-3, set the pace for tone transmission, and reliability went up. So did the weight.

Then Vic Nelson, of Deltron, experimented and came out with a little 22½ volt tone receiver using transistors. It was small, lightweight, and operated well — so long as you watched the temperature. You could go out in the morning, tune up and fly, but as the air warmed up, if you didn't check the tuning, first thing you know you'd lose range. Sometimes, you even had to tune between flights! But it was a long step in the right direction.

A lot of other development came along — combinations of tubes and transistors — and then Frank Hoover came out with the forerunner of today's popular 3 volt all transistorized tone receiver. It worked fine, but had a couple of bugs that could cause a lot of trouble, if you didn't know about them. For one thing, it was temperature sensitive, not so much in tuning as in the rate of response. If the temperature dropped below the normal 60-75 range, the receiver would lag behind the transmitter signal. You'd push the button once, and after noticeable lag — perhaps ¼ to ½ second, the receiver would respond. And if you pressed the transmitter button twice, but without waiting for the receiver to pick up the first signal, you'd only get one response! Boy, did that get confusing! But we learned to live with it although it didn't take long for Frank to improve his circuit and overcome the problem.

Then there was the swamping — the triggering of the receiver when the transmitter antenna is too close. If you have a receiver that swamps, it's not bad — it's just a nuisance. There are ways to get around it; the simplest is to have a friend launch your model while you remain some distance away with the transmitter. The other way is to launch your model with receiver on and transmitter off (not the other way around!) then turn your transmitter on after the model is too far away to swamp. This technique is only good if you know your model will free flight until you get the transmitter on. Even then there are drawbacks. Many a model has been saved from a crackup due to a



The Babcock BCR-3 — one of the most reliable of early day receivers. Heavy and large by today's standards.

bad launch because the pilot made a fast correction. And I've seen crackups at the end of an otherwise perfect flight because the pilot forgot about swamping, brought the model in too close, and the receiver locked in. Seen it? Heck, I might as well admit it — I've done it!

Swamping can even go so far with some receivers as to cause them to stop working until you turn them off and then back on again. I've seen fly aways where the pilot checked the operation of his controls just prior to launch, then heaved the model into the air without realizing that the receiver had swamped out on the last checkout signal and wouldn't take another signal. By that time, of course, it was too late to turn the receiver off and back on.

So check your 3 volt receivers for their swamping characteristics — unless you have one of C&S's units with the "sensimatic" circuitry which prevents swamping.

Another pitfall — and this isn't limited to the 3 volt receivers — is the Bad Connection. Hooking up these little receivers is so simple that it can lead to carelessness. If the connections to the escapement are poor, due to a high resistance or "cold" solder joint, the voltage at the escapement can be too low even though the batteries are fresh. A voltmeter is a must in order to find bad connections. They can occur anywhere — in battery boxes, switches, or escapement connections. In fact, it's not a bad idea, if you do find a bad solder joint, to resolder all connections as an added precaution.

Enough has been said about interference to preclude any lengthy dis-

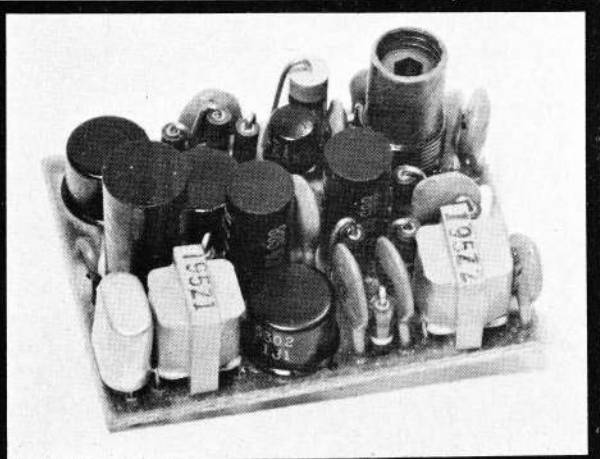
cussion of it here. You've all suffered from it. The newer superhet receivers have gone a long way towards reducing interference, although not entirely eliminating it. And the recent FCC actions had one significant statement, that wider band separation isn't feasible, therefore modelers either must live with and accept interference as a way of life — or improve the selectivity of their equipment. In that regard, the new development by Babcock Controls looks very promising. With a tone frequency way above the normally used range (6000 cycles compared to 400-1000) it takes careful tuning to get maximum range, but it pays off, because the Babcock system, for all practical purposes, is interference free. This method of avoiding interference can also be used, so I understand, with more sophisticated equipment than the little 9 volt BC-21 system. If so, it will be another significant milestone in the development of radio control hobby equipment.

So over the years, various manufacturers have enjoyed periods of leadership. But each improvement came complete with some shortcoming, which some other manufacturer improved on, and then it was his turn to lead the field for a while.

But there is one thing which is universal with them all, and that is that when they go into production, some of the units coming off the line have bad components. No matter how hard they try, the manufacturers haven't been able to produce 100% perfect units. This is probably one of the

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The C & S 505 double ended receiver — an example of present day 3-volt relayless design. Progress, along with miniaturization!



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most frustrating problems there is — both to the modeler and the manufacturer.

I'm sure you've been out at your flying field and heard some modeler say "Blast that blankety blank — equipment. I'll never use it again. It's no good!" Meanwhile, all over the country, hundreds of other modelers are having great success with the same equipment.

More often than not, the blame on the manufacturer is misplaced. The modeler has not read instructions, or has faulty connections, batteries, switch or a bad installation (like tightening down the backplate of an escapement to a warped bulkhead, thus twisting the escapement out of adjustment).

You will be interested to know that it's an absolute fact that most radio equipment returned to the manufacturers for service is found to be in good working order. Long ago I learned to send stuff back with a note describing what happened, because, half the time it was not the equipment but rather the way I was using it. Not always, though, and this is why it's important for you to be understanding.

At the prices which our hobby equipment is sold, it is necessary for manufacturers to use components with fairly broad ranges of performance. Usually the factors tend to balance out when the total circuit is completed, and a completely satisfactory unit results. Occasionally, though, the tolerances all add up in one direction, then the unit becomes marginal. It may pass the bench check for shipment, but after a very short time may cease to work. By that time you've got it installed, and "The blankety blank thing is no good!" You're right — and believe me, the manufacturers

want to fix it even more than you do. Their reputation is at stake.

So, if your equipment doesn't work, even after a thorough checkout, don't cuss it — send it back, but describe the symptoms. But, before you do, be sure you're on firm ground. It's always embarrassing to get a note that says something like: "Sorry you had trouble, but you should have made that current check with the switch off, as it says on page 3 of the instructions."

Since you and I and the manufacturers are all in this together, we have to work together. So if, after a reasonable time, you don't get any reply from an inquiry you've sent to a manufacturer, let us know. Maybe we can help. We'll try.

Let me close with a portion of a letter received from Ed Lowe of Holdingford, Minnesota.

"Thank goodness someone has at last recognized that there is such a critter as the "Sunday flier"! I have been one since the tail-end of the bending-bamboo-over-a-candle-flame era. I have dabbled in hand-launch gliders, tow-line gliders, 10c Comet models (especially the 10c and 25c Comet kits of the Curtis Robin), scale rubber, contest-type rubber, scale gas, contest-type free-flight gas (I mean gasoline, with points, condenser, coil, flight batteries, booster batteries, 3-1 mix, etc.) scale U-control, stunt U-control, (my first yo-yo was Walker's Fireball), R/C since Citizenship's 465 (or was it 456 mc outfit?) — and have attended contests as a fascinated spectator. But as far as competing? No, thanks, I'll fly for fun. So far, I am still in the single-channel stage of R/C. Sure, I would sort of like to go multi, but why bother? I still haven't made the most of single-channel... Long live the "Sunday flier"!!

Now there's an "old-timer newcomer!" If we can help guys like Ed — as well as some of you who are completely new to the R/C hobby — then you Sunday fliers can trade problems and answers through this column. Tell me what you'd like to have discussed. Meanwhile, I'll finish up the plans for the sport biplane and get them out for you next month.
