

Citizen-Ship 465 mc. "CC" Transmitter & "AR" Receiver

■ This equipment is unique in the radio-controlled field, since it is the only line made for use in the "Citizen's" 465 mc. R/C spot. While operation in the field on this frequency is just about as easy as on 27 $\frac{1}{4}$, manufacture of the equipment is another matter—as is the fact that the transmitter has to pass strict F.C.C. regulations, especially as to frequency stability. Because of this requirement, the user is not allowed to do *any* maintenance work on the transmitter—not even to the extent of replacing a bad tube. He can, however, renew batteries as needed.

Since the Model AR receiver is the newest thing in this field, we will cover it here; note, however, that the older and larger Model CR is still being made, and is often preferred by those who don't object to its larger size and wish to operate their models at the greatest possible range.

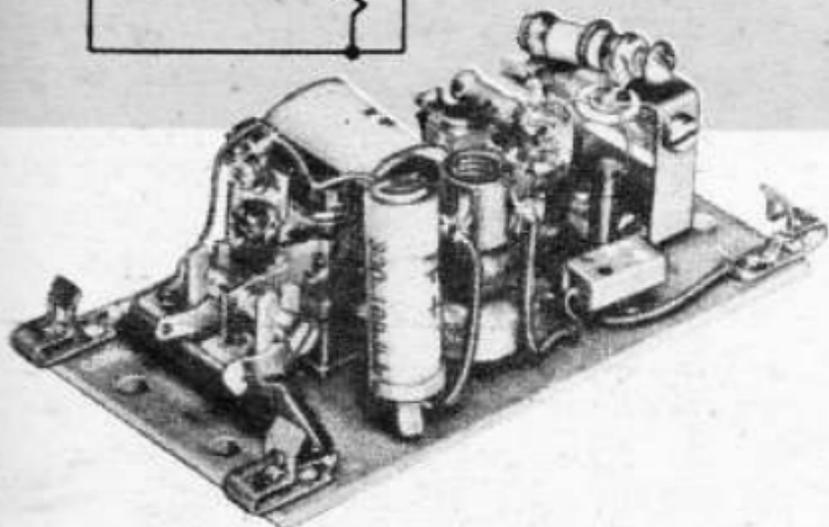
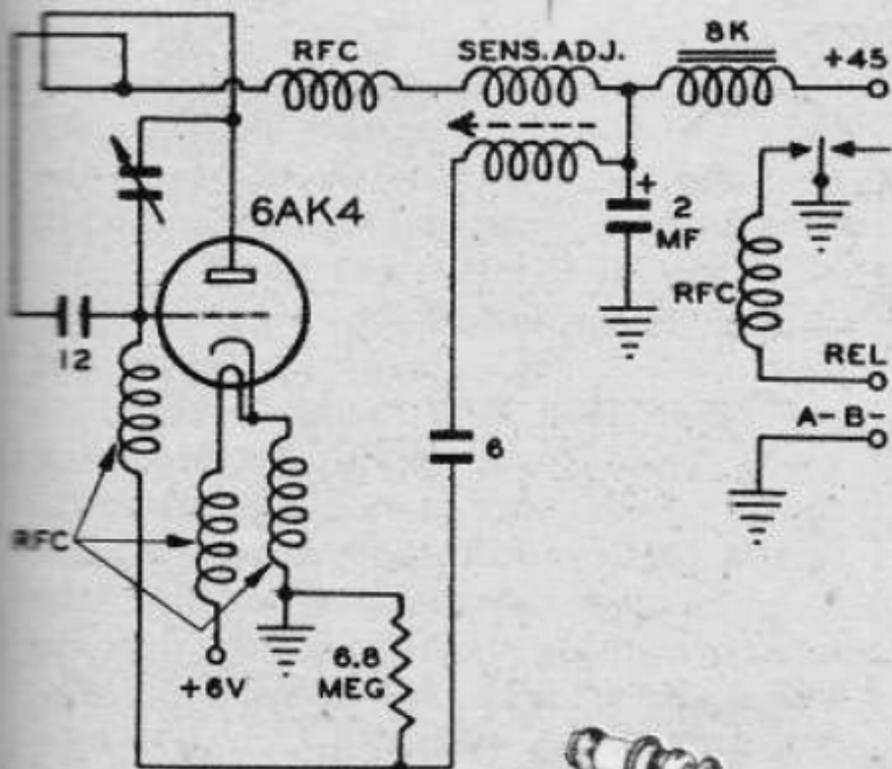
Circuitwise, the two receivers are very much alike, the main difference being that the Model AR does not have the attached loop antenna. Because of this it is much more compact, and has, in fact, been fitted nicely in Half-A planes. No external antenna is needed with the AR, since the associated wiring to batteries and actuator or escapement provides all sig-

nal pickup needed. The AR may be mounted nicely by cementing a layer of sponge rubber to the bottom of the bakelite chassis, then cementing the other face of the rubber to a thin piece of plywood. It can also be suspended from the four corners by rubber bands; a small spring-type contact clip for battery and relay connections is mounted at each corner of the base.

The second main difference between the AR and CR receivers is that the former is equipped with a variable capacitor which makes it simple to touch up tuning at the field.

This type of receiver requires considerably more A battery power than those used in 27 $\frac{1}{4}$ mc., due to the fact that an entirely different sort of tube is necessary. Even so, it has been found practical to use various combinations or four or five 1.5 V. cells, as explained at length in the instruction booklet. To balance the higher A drain, the receiver is extremely economical on B batteries, and the smallest hearing aid units will give very good life.

The plate current change of both Citizen-Ship 465 mc. receivers is about the same, regardless of signal strength, so it is not necessary to make repeated long distance



range checks. The transmitter puts out very little signal when the antenna is removed, and therefore makes an excellent test signal source for tuning the receiver. Detailed steps on such tuning are included in the accompanying instructions.

While it is illegal to tamper with the transmitter in any way, we give the circuit here, since it is of real interest to the electronically-minded modelers. Because of the stringent stability requirements, the Model CC transmitter has features not seen in any other R/C transmitters. It utilizes a "faraday shield" between the tuning inductance and the antenna loop to reduce detuning effect, should the antenna be held too near a conducting surface. Also, there is a built-in temperature compensator. Both the tuned circuit and antenna loop are formed by punching out part of the metal chassis, and because of this, the tuned circuit—and B plus—are grounded to case.

The neon lamp on the case is a valuable check on the condition of the B batteries; it will light as long as they are strong enough to work the transmitter reliably.

It should be noted that 465 mc. equipment is increasingly useful nowadays, when every day sees more and more modelers beginning operation on the 27¼ mc. R/C spot; there is no interference between the two, incidentally, and receivers on the two R/C spot frequencies may be operated in the same model simultaneously.

(Continued on page 83)

Citizen-Ship

(Continued from page 71)

Transmitter: Model CC. Case size 9 x 4 x 2 $\frac{3}{4}$ ". Antenna projects 4" from top of case and is 12 $\frac{1}{4}$ " wide; must be pointed at the model to get maximum range. On-off toggle switch for batteries, snap-type push-button for signal. Neon indicator pilot lamp. Batteries fit snugly in own compartment, attach by plug and snap clips. Unit takes about one min. to warm up ready for use. Weight with batts. and antenna—4 lbs. Battery complement: B battery—two 67 $\frac{1}{2}$ V. units (Eveready 467 or equiv.), 135 V. at about 20 ma. with signal on. A battery—one 6 V. unit (Eveready 744 or equiv.), 200 ma. at 6 V.

Receiver: Model AR. Overall size about 4 x 1 $\frac{3}{4}$ x 2 $\frac{1}{8}$ " wide. Weighs about 4.1 oz., has Sigma 4F relay. Tube soldered in place. Adjustments for RF tuning and quench frequency; latter controls sensitivity. No antenna of any sort required. Relay set to operate at about .5 ma. and open at .4 ma. Heater-type tube takes half minute or so to warm up thoroughly. Battery complement: lightest recommended batteries are four penlite cells for A supply, 6 V. at 150 ma. Five pen-cells in series will give considerably longer service—will not harm tube. B battery—two 22 $\frac{1}{2}$ V. units (Eveready 412 or equiv.), 45 V., idling current is .25-3 ma. With signal, current is .9-1.3 ma. Lightest set of batteries weighs 5 $\frac{3}{4}$ oz.