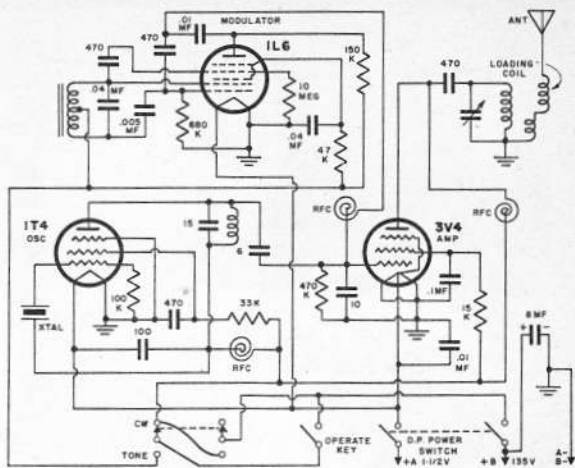


Citizen-Ship's CTX transmitter (right); SSTR receiver at bottom of page.



Citizen-Ship's R/C Super-Het Cuts Out Interference

■ First commercial R/C super-het to attain wide distribution in the hobby field is the Citizen-Ship Radio Corporation's Model SSTR. Design of this receiver, which the makers call a "selective" unit to distinguish it from other receivers in their line (which are now considered non-selective) is based upon the fact that while the new F.C.C. regs placed our six spot frequencies about 50 kc apart, to do the job right we need much better than 50 kc selectivity. Reason is that between each two of our R/C spots there are 5 channels of about 10 kc width given over to Class D Citizen channels for low power voice communication.

The terms selective and non-selective are relative, of course; actually such receivers as the Citizen-Ship 3VTR and others of the same general class are selective—but nowhere near enough so to separate signals 10 kc apart—or even 50 kc. It is generally felt that most super-regen receivers on the 27 mc frequencies are 250 to 500 kc "sharp"—they can operate within this amount of frequency separation from another strong transmitter signal. Some might be able to work on 27.255 mc, for example, with another transmitter working at the same time on the farthest removed R/C spot—26.995. But most cannot.

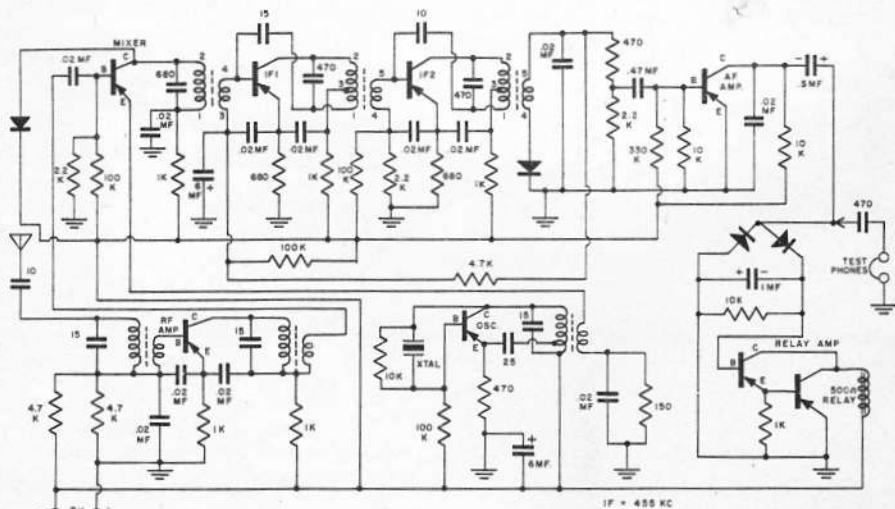
The Citizen-Ship SSTR has circuitry somewhat like the better types of all-transistor broadcast receivers, as least as far as the RF section goes; this is understandable when it is recalled that BC receivers also have to work to 10 kc station separation. Unlike BC receivers, fixed frequency operation is highly desirable in R/C, and to this end the

SSTR has a crystal-controlled oscillator.

We should perhaps caution those who purchase any R/C superhets not to panic when they see the frequency marked on the crystal—it will always be different than that on your transmitter crystal by the amount of the intermediate frequency used in the super-het. In the SSTR this is 455 kc, and the oscillator operates by this amount lower in frequency than the incoming signal (some super-hets run the oscillator the same amount higher than the signal). Citizen-Ship warns that very close tolerance crystals must be used, due to the sharp selectivity of the receiver; the crystals they supply are made to a tolerance of .0025%.

The SSTR utilizes a tuned RF stage, which not only adds some selectivity and sensitivity but helps overcome a problem peculiar to all super-hets, called "image interference." There are six tuned circuits in the outfit, three in the RF section, three in the IF. It is the latter which contribute most to overall selectivity or sharpness of tuning. When crystals are changed, C-S recommends that you touch up tuning of the RF and antenna coils, also the three I.F.'s; it is generally not necessary to readjust the oscillator coil, which is set to optimum at the factory. Each SSTR is stamped for a particular frequency, but you can change this to any other by inserting the proper crystal and retuning as noted above.

Mechanically, the SSTR components are mounted on a printed circuit plate, with an aluminum bottom pan and an aluminum top cover. The relay contact connections, two battery leads and connections for a test phone come out the



cable and terminate in a 7-pin plug.

The receiver we operated was on 27.045 kc; just to check interference rejection capabilities we fired it up and brought the antenna of another R/C tone transmitter working on the next lower spot (26.955 kc) to within a foot of the receiver antenna before any interaction was noted. The 27.045 Citizen-Ship Model CTX transmitter continued to operate at the same time.

Very much the same receiver is a part of the Citizen-Ship SS-MSR-8 multi-channel super-het, but the output section of the latter feeds an 8-channel reed band, instead of a low resistance relay, and the case is larger to accommodate reeds and the 8 relays. Also, the SS-MSR-8 works on 15 volts instead of 9. We understand that Citizen-Ship might consider making the super-het RF part of the receiver available for use in converting the older C-S 8 channel reed receivers to "selective" operation—if there is sufficient demand for such conversion.

Since the Citizen-Ship line did not include a single channel tone transmitter, Model CTX has been added. This is a fairly conventional outfit utilizing three tubes, two in an MOPA RF circuit and the third for modulation. It can be used for both tone and CW transmission, by proper setting of switches. All small components are mounted on a rugged steel chassis, with a bottom plate to prevent accidental shorts or other damage from the batteries. "Wired wiring" is employed. This transmitter can work on any of the six R/C frequencies by insertion of proper crystal and retuning. Audio tone

(Continued on page 63)

Super-Het

(Continued from page 53)

is about 700 cycles at 100% modulation.

SPECIFICATIONS: Citizen-Ship Model SSTR Selective receiver for 26.-995 to 27.255 mc operation. Super-het circuit with eight transistors. Antenna length not critical—the longer the better. Six tuning adjustments; will not require retuning unless crystal is changed and none is critically sharp. 500 ohm Gem relay. Overall size, 4 x 2- $\frac{5}{8}$ x 1- $\frac{13}{16}$ ". Weight with cable and plug, 5 $\frac{1}{2}$ oz. *Battery requirements:* single 9 volt battery—Eveready 216 or equiv. Idling current on CW, 3 $\frac{1}{2}$ ma; 15 ma with tone.

Citizen-Ship Model CTX transmitter for 27 mc R/C use. 1T4 crystal oscillator, 3V4 RF amplifier, 1L6 (triode-pentode type) modulator and AF oscillator. Front panel has slide switches for battery power; for CW or tone use, a slide-type keying button. Designed for high RF output and 100% modulation at 700 cycles. Collapsible whip antenna, 53" long when extended. Red crackle-finished case measures 9 $\frac{1}{4}$ x 4 $\frac{5}{8}$ x 3". Set weighs 5 $\frac{1}{2}$ pounds with all batteries and the antenna. *Battery requirements:* "A" supply, 1 $\frac{1}{2}$ V at 200 ma—Eveready 472 or equiv. "B" supply, two 67 $\frac{1}{2}$ volt batteries—Eveready 467 or equiv. Current drain is about 20 ma with new batteries, drops slightly when tone is keyed. Transmitter will operate with B battery as low as 80 volts, but at reduced power output.