

paratus. Workmanship and appearance are top grade. Both receiver and transmitter are in grey hammertone finish cases, that for transmitter being of steel for strength.

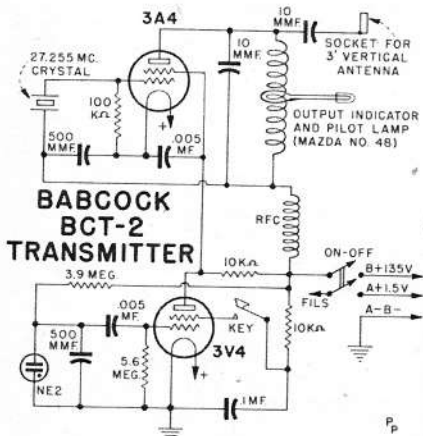
This equipment operates on a modulated signal, that is, the receiver will not operate unless it is receiving a signal with a superimposed audio tone. This has several advantages, not the least of which is that it makes the receiver much less susceptible to interfering signals from other 27 mc. transmitters. Receiver relay does not operate with straight unmodulated carrier, but only when the tone is sent out. Transmitter carrier is on all the time to minimize interference. Any failure at the transmitter, and most failures in the receiving end will leave the relay open; thus the system is termed "fail-safe".

The transmitter is entirely self-contained, with a 1/12 wave whip antenna which plugs in at top of the case. A lamp bulb on the front panel indicates power output, and is also used for tuning up, though once tuned for any particular crystal, retuning should never be required. Bulb goes on when power switch is turned to On position, and dims when key is depressed. Condition of batteries (and other parts of transmitter) is shown by brightness of bulb. Thus no meter is required for tuning or regular operation.

Transmitter circuit shows 3A4 tube is crystal-controlled oscillator, power output without modulation is about 2/5 W. Neon tube oscillator drives 3V4 modulator tube, which applies tone of about 900 cycles to screen grid of oscillator. Modulation percentage is about 85, and power output with key down about 1/10 W. This sounds low, but is ample, since tone systems normally require very little transmitter power, and receiver is very sensitive.

Transmitter batteries are all held by a single snap-on metal clamp, and are very easy to replace.

Receiver is actually a 4-tuber, since both halves of the 3A5 tube are utilized for different purposes. There is also a metallic rectifier between the last two tubes. Without signal, or with carrier only, last tube draws no plate current, due to use of C battery (this may be the tiniest 15 V. unit you can buy; no current is drawn from it). Transmitter carrier is normally on at all times, since this (Continued on page 58)



Rcvr. & Trans.

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makes the receiver even less affected by interference. Relay current goes from zero to about 6 ma., assuring reliable operation, and making possible use of sealed lightweight unit here. It is normally set to operate at about 3 ma. and release at about 1.5 ma., to give large margin of safety.

Receiver antenna coupling system is designed so that there is little or no hand-capacity effect, and any length from 2 ft. to 6 ft. may be used; since there is no tricky sensitivity adjustment, receiver may be expected to work in the plane just the same as it does on the shop bench. Tuning is done by connecting a pair of headphones to terminal 5 on the receiver power socket; with no signal you will hear a strong hiss. When transmitter is turned on, hiss disappears; pushing key button brings a loud audio tone. Tune-up simply means turning the screw on receiver to get tone as loud and clear as possible. This should be done at a distance of 100 ft. or more, as with any R/C equipment.

Receiver and transmitter come with all tubes, relay and crystal, also transmitting antenna. Receiver installation kit consisting of on-off switch, phone jack, battery connectors, wire, battery boxes, is available for \$2.75. A complete instruction manual is also furnished; it contains both simplified and technical descriptions of the equipment, circuit diagrams, installation and operating data. There is also a circuit for "recharging" the receiver batteries from the power line, thereby greatly prolonging their life. The Babcock equipment is intended for use with escapements, but should work perfectly with pulse equipment, for those who prefer such operation; the relay is of SPDT type, though only one fixed contact is brought out to the power socket. The other fixed relay contact may be reached at the relay socket.