

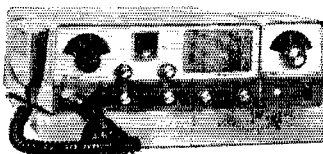


Recent Equipment

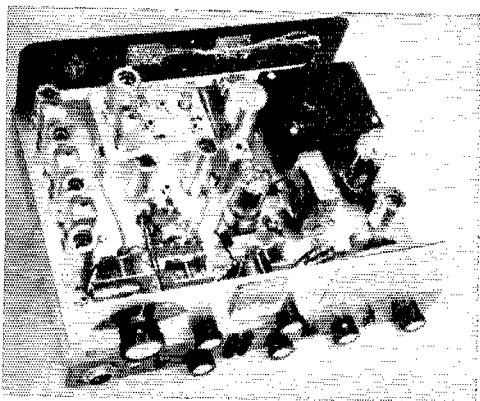


To acquaint you with the technical features of current amateur gear.

The Knight-Kit TR-106 Transceiver



THE TR-106 is a 6-meter transceiver kit covering 50 to 52 Mc. The transmitter portion uses the familiar 2E26 at an input power of 15 watts. The receiver portion is dual conversion, with a crystal-controlled converter featuring a nuvistor r.f. amplifier in the front end. The transceiver contains a built-in spot switch, push-to-talk control, a.c. and d.c. power supplies, multiple-position crystal switch, internal speaker, and provisions for a matching v.f.o.



Top-chassis view of the TR-106. The converter chassis is the small box at the rear of the main chassis. The transistors for the inverter are mounted on the back panel.

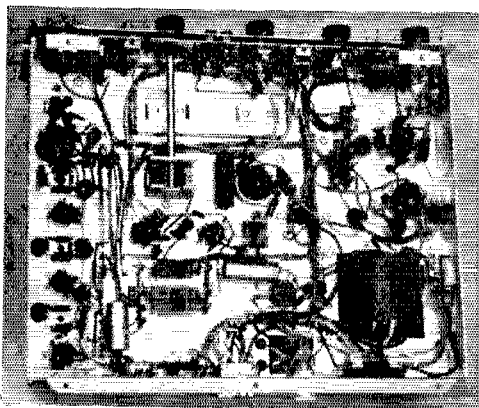
Transmitter

Fig. 1 shows a block diagram of the transmitter with the receiver components at the top and the transmitter components at the bottom. The Colpitts oscillator, V_9 , uses 8-Mc. crystals in the grid circuit. The plate circuit is tuned to the third harmonic. The resonant frequency of this circuit is controlled by the MULT control on the front panel. In the next stage, V_8 , the 24-Mc. signal is doubled to the output frequency. The plate circuit of the doubler uses an inductively-coupled double-tuned circuit. This stage is stagger tuned to obtain a 2-megacycle bandwidth. The final, V_7 , operates straight through at 50 Mc. using a combination of grid-leak and cathode bias. The latter protects the tube if grid drive is

lost. The output circuit is a pi network designed to work into an impedance of 30 to 90 ohms. Transmitter tune-up is merely a matter of tuning all stages for maximum output. A combination S meter and peak-reading r.f. voltmeter is provided for this purpose. Transmitter alignment requires (not furnished) a dummy load and 3 crystals.

Receiver

The receiver uses a crystal-controlled converter which is factory wired and aligned. Installation of the converter requires two bolts and soldering of four wires. A six-meter signal at the converter input is mixed with the signal from the crystal oscillator to obtain an output of 15.6 to 17.6 Mc. which is fed to the second mixer, V_{1A} . The local oscillator, V_{1B} , is coupled to the mixer by interelectrode capacitance, producing a signal at 1650 kc. This signal is fed to a two-stage i.f. amplifier, V_2 and V_3 , which uses three double-tuned circuits. The amplified signal is then detected by V_4 , and at this point the a.g.c. bias is obtained and applied to the i.f. amplifiers. Also combined in V_4 is a series-gate noise limiter activated by a switch on the rear panel. The detected output is fed to the a.f.



The bottom view of the TR-106 showing the wiring harness. The transmitter is in the center, the receiver on the left, the audio on the right.

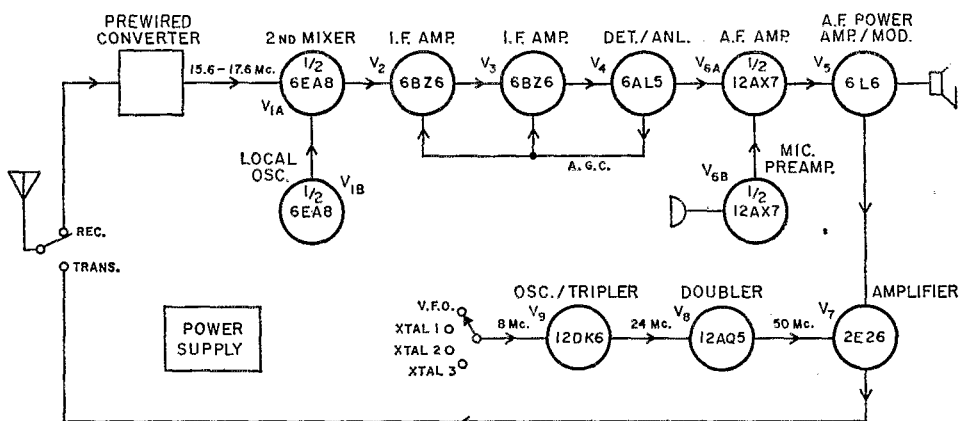


Fig. 1 — Block diagram of the TR-106

amplifier, V_{6A} , the a.f. power amplifier, V_5 , and finally to the speaker. Low-impedance earphones may be used at the front-panel jack, thus muting the speaker. The remaining half of V_6 serves as a microphone preamplifier which feeds V_{6A} . The modulator is designed for 300 to 3000 c.p.s. frequency response.

A note of interest for the home constructor concerns the mounting of the a.f. power amplifier. To lower overall cabinet height the socket for this tube is mounted below the chassis level using metal spacers. This also gives added ventilation to the amplifier circuit components as well as the tube.

Three complete turns of the receiver tuning knob are required to cover 50 to 52 Mc. Dial markings are every 100 kc., with special marks for the 49.980-Mc. MARS frequency and 50.0 to 50.1 Mc. for the c.w. portion of the band. To align the receiver two v.t.v.m.s and a 1650-kc. r.f. source are needed for the i.f. section. One v.t.v.m. is used to monitor the a.g.c. bias, and the other is used across the speaker for a more accurate output indication than using your ear. Eight-megacycle crystals can be used to align the r.f. section. No adjustment of the converter should be needed or attempted.

This and That

A spotting switch is located on the front panel; this switch removes the B plus from the doubler and final tubes. The signal from the remaining stage is sufficient for spotting the crystal or v.f.o. frequency.

Power for the transceiver is supplied by a voltage-doubler circuit using a special transformer. For a.c. the transformer functions as a normal step-up. For 12-volt d.c. operation the transformer and two transistors function as an inverter. Two power cords are supplied, one the standard a.c. type, and the d.c. cord which is supplied with a cigar-lighter plug. Changing power cords automatically switches the correct fuse into the circuit.

Transmit-receive switching can be controlled from the front panel or by a p.t.t. switch on the noise-canceling microphone supplied.

The circuits used are standard types with most of the wiring accomplished through a harness. The use of the harness cuts wiring time in half. The kit is packaged so that all parts are right at hand.

— WIDEJ

Knight-Kit TR-106 Transceiver

Height: 5½ inches.

Width: 13¼ inches.

Depth: 11 inches.

Power Requirements:

110-130 volts a.c., 90 watts receive, 105 watts transmit.

12-15 volts d.c., 6.8 amp. receive, 8.1 amp. transmit.

Price Class: \$140.

Manufacturer: Allied Radio, Chicago, Illinois.

The Knight-Kit V-107 V.F.O.

The Knight-Kit V-107 is a v.f.o. with 8-Mc. output for transmitters in the 6- and 2-meter bands. The actual output is from 8 to 8.22 Mc. (144-148 Mc.) for 2 meters or 8.333 to 8.666 Mc. (50-52 Mc.) for 6 meters. The v.f.o. must be recalibrated each time the band is changed. To

do this, the set screw holding the dial in place must be loosened and the dial rotated 180 degrees and the set screw tightened. The coil and capacitor used to determine the high and low ends of the band, respectively, are then adjusted for correct dial calibration.