Year 1964 GENERAL DESCRIPTION

The R.L, Drake model TR-4 is a single sideband transceiver designed for the transmission and reception of upper and lower sideband signals on the 80 through 10 meter amateur bands, AM and CW capabilities are included.

Its compact size makes it ideal for both fixed station use in conjunction with our model AC-3 120 volt AC Power Supply, or for mobile installations, using our model DC-3 12 volt DC Power Supply.

The 300 watt P.E.P. input on SSB enables the TR-4 to give an excellent account of itself barefoot and it will drive the highest powered ham linear amplifiers.

Upper and lower sideband selection is accomplished by switching between two 9 mc crystal lattice filters with 2.l KC passbands. Among the other features included on the TR-4 are VOX and PTT on SSB and AM, diode detection for AM, shifted carrier CW, automatic transmit receive switching on CW, built in CW sidetone, separate RF and AF gain controls, solid state VFO with linear permeability tuning, transmitting and receiving AGC indicator and plate ammeter/RF output indicator, adjustable pi-network output, and built in crystal calibrator.

The addition of the accessory RV-4 remote VFO speaker combination enables the operator to receive, transmit, or transceive throughout the band being used without disturbing the setting of the TR-4 tuning dial. This is useful for working DX stations operating outside the United States phone bands, or for working near your own frequency in search of a clear spot under crowded band conditions. The accessory FF-1 is a fixed frequency adapter useful wherever crystal controlled operation is desired. It provides two switch selected channels and allows off , crystal controlled transmit only or transceive operation.

GENERAL SPECIFICATIONS

FREQUENCY COVERAGE: Full coverage on all amateur bands 10 thru 80 meters, in seven 600 kc ranges: 3.5 to 4.1 mc, 7.0 to 7.6 mc, 13.9 to 14.5 mc, 21 to 21.6 mc, 28 to 28.6 mc, 28.5 to 29.1 mc, 29.1 to 29.7 mc.
SOLID STATE VFO: Has linear permeability tuning. Tunes 4.9 to 5.5 mc for all ranges.
DIAL CALIBRATION: 10 kc divisions on main tuning dial and 1 kc on tuning knob skirt. Effective length of circular dial scale is over 14 inches.
FREQUENCY STABILITY: High stability solid state VFO tunes same range on all bands. Overall drift is less than 100 cycles after warm-up, and less than 100 cycles for plus or minus 10% line voltage change.
MODES OF OPERATION: SSB (Upper or Lower Sideband), CW, and AM.
FRONT PANEL CONTROLS: Main Tuning has fluted knob with adjustable 25 division skirt. Tunes VFO and rotates main dial.
RF Tune tunes the RF circuits common to receiver RF amplifier and transmitter driver stages. 0-10 scale.
Plate and Load tuning adjust pi-network capacitors in transmitter for proper resonance and loading on each band.
Band switch selects desired ham band (see frequency coverage).
Function switch has four positions; CAL, SSB, X-CW, X-AM. CAL operates built-in 100 kc crystal calibrator for accurate setting of main tuning hair line indicator and knob skirt. SSB provides SSB operation, either VOX or PTT. X-CW provides for CW operation with automatic transmit receive switching and CW sidetone, and is used for tune up. X-AM provides controlled carrier AM operation with VOX or PTT, and with diode detector for receiving.
XMTR GAIN functions as mike audio gain on SSB and AM, and as carrier injection control on CW.
RCVR GAIN knob controls receiver AF gain and power ON-OFF switch. Lever behind knob controls setting of RF gain.
SIDEBAND switch in conjunction with indicator lights marked Upper and Lower selects desired sideband by connecting into the circuit either the upper or lower sideband filter. (X position used when in X-CW or X-AM positions of Function Switch.)
OUTPUT METER CONTROL switch converts plate meter to read relative OutPut, when pushed. Rotating varies output meter sensitivity.

RIGHT SIDE SCREWDRIVER ADJUST CONTROLS: VOX Gain
Anti VOX Gain
S-Meter Zero

RIGHT SIDE JACKS: Headphone (disconnects speaker circuit)
Microphone (3-circuit for PTT)
Key (normally closed) .

REAR CONTROLS: Sidetone (adjusts sidetone volume)
Lights (for dimming dial lights).

REAR JACKS: Power (connects TR-4 to power supply and speaker)
RCVR MUTE (for muting an external receiver)
RCVR ANT (Uses TR-4 ant. relay to connect an external receiver to the antenna)
Antenna (for connecting the TR-4 to the antenna).

LEFT SIDE CONTROLS: TCVR/RCVR switch (for selecting between the use of the TR-4 or an external receiver for receiving).

INSIDE CONTROLS: Carrier balance .

METERS: Receiver S-Meter/transmitting AGC indicator
Transmitter Plate Ammeter/relative R. F. output indicator.

MISC: 20 tubes including voltage regulator; two transistors; nine diodes; 100 kc crystal calibrator built in; Dimensions: 5 1/2 high, 10 3/4 wide, 14 3/8 deep.
Weight: 16 lbs.

TRANSMITTER SPECIFICATIONS

SINGLE SIDEBAND: 300 watts P.E.P input power, VOX or PTT. Two special 9 mc crystal filters provide upper or lower sideband selection on any band, without the necessity of shifting oscillators . Unwanted sideband suppression of more than 60 db and carrier suppression of 50 db, Overall audio frequency response 400 to 2500 cycles at 6 db down, Distortion products 30 db down at maximum output.
CW: Power input 260 watts,, Carrier is shifted approximately 1000 cycles into one sideband, and mixer and driver are keyed. Grid block keying is free from chirps and is properly shaped to minimize clicks. Automatic transmit/receive switching when key is operated. CW sidetone oscillator for monitoring.

AM: Controlled carrier AM screen modulator is built-in, 260 watts P.E.P. input. Low carrier power increases 6 times to 50 watts output at maximum modulation, This system is compatible with SSB linears. VOX or PTT, Diode detector used for receiving on this mode. Product Detector can be used by switching manually.
OUTPUT IMPEDANCE: Nominal 50 ohms, adjustable with pi-network.
MICROPHONE INPUT: High-impedance .

RECEIVER SPECIFICATIONS

SENSITIVITY: Less than 1/ 2 microvolt for 10 db S/N.
I.F. SELECTIVITY: 2.1 kc at 6 db, 3,6 kc at 60 db.
AGC: FULL AGC on received mode audio output varies less than 3 db for 60 db change in signal level .Any amount of AGC from zero to full can be had by adjustment of RF gain control. Time proven Drake AGC system provides fast attack and slow release with noise pulse suppression. No pumping or popping evident.
ANTENNA INPUT: Nominal 50 ohms.
AUDIO RESPONSE: 400-2500 cycles at 6 db.
AUDIO OUTPUT POWER: 2 watts.
AUDIO OUTPUT IMPEDANCE: 4 ohms.
POWER SUPPLY REQUIREMENTS
Due to the 300 watt P.E.P. input rating, the TR-4 will require a power supply capable of low voltage at high current with very good dynamic regulation. The voltage and current requirements are as follows: 650 volts at 300 ma average and 500 ma maximum with 10% regulation from 100 ma to 500 ma and maximum ripple of less than 1%.
250 volts at 175 ma with 10% regulation from 150 ma to 180 ma. This includes the effect of the 650 volt supply change if both voltages are obtained from the same transformer. Maximum ripple must be less than 1/4 %.
-45 to -65 VDC adjustable filtered bias into 33 KOhm load.
12.6 Volt AC or DC at 5.5 amps.

TUBE: 20 tubes including voltage regulator, four transistors; nine diodes

TUBE
Complement Transmitter Receiver
12AX7 Mike Amp. -----
6EV7 VOX Amp. /Relay -----
6GX6 9 MC Xtal Osc. BFO/Prod . Det
12BA6 I.F. Amp. -----
12BA6 ----- I.F. Amp.
6BZ6 ----- I.F. Amp.
12AX7A AGC AGC
6AQ5A Anti-VOX Audio Output
6HS6 Mixer -----
6EA8 Cathode Fo 1 Mixer/Cath . Fol.
6EA8 Pre-Mixer/Xtal Osc. Pre-Mixer/Xtal Osc.
13DE7 AM Screen Mod. -----
12BA6 ----- R.F. Amp.
6BA6 ----- Crystal Calib.
12BY7 Driver -----
3 x 6JB6 Power Amps -----
0A2 Voltage Reg. Voltage Reg.
TIS94 VFO VFO
2N3858 VFO Buffer VFO Buffer
2N3394 VFO Shut Off VFO Shut Off
2N3877 Neon Driver Neon Driver
