

TCS TO TCS-14 RADIO TRANSMITTING-RECEIVING EQUIPMENTS

Use.—Semiportable—ship, shore.

Frequency range transmitter and receiver.—1500 to 12,000 kc. in three bands.

Power output and emission.—25 watts, A₁; 15 watts, A₂.

Description.—The Navy Models TCS to TCS-14 semiportable transmitting-receiving equipments are designed for medium and high frequency telegraph and telephone operation. These equipments are used extensively on patrol and landing craft, reconnaissance vehicles, and for similar purposes.

All units are mounted in corrosion-proof cabinets of sheet steel utilizing the subassembly type of construction. The transmitter and receiver may be assembled either side by side or stacked vertically with the horizontal type of mounting preferred. The assembly may be located on a shelf or bulkhead.

The *transmitter* is composed of an oscillator, buffer-doubler and power-amplifier stage with modulator. The frequency range is covered by means of three bands. Crystal-control is provided on any four desired frequencies within the range, and eight harmonics of these frequencies. For master oscillator use, a separate oscillator tube and associated circuits continuously variable, and capable of controlling output at any frequency within the range are used. The single-button carbon microphone works directly into the modulator-stage without the use of a speech-amplifier. The loading coil permits the use of short length antennas down to 20 feet, although better efficiency is obtained with the use of a longer wire up to 75 feet in length.

The *receiver* utilizes a superheterodyne circuit, with 1 radio-frequency stage and 2 I. F. stages, with AVC used for A₂ reception. A range of 1500-12,000 kc. is covered in 3 bands, utilizing either a continuously variable oscillator or crystal-control. Crystals may be employed on 4 frequencies in band 1, and on various higher frequencies determined by the harmonic frequencies of the crystals.

The *remote-control unit*, which may be mounted vertically or horizontally at a distance up to 20 feet from the power supply unit, contains a loudspeaker, audio volume-control, receiver output-switch providing for headphone or loudspeaker operation and ON-OFF switches for both receiver and transmitter. Headphone, microphone, and key jacks are also located in this unit. No frequency control of transmitter or receiver, or choice of emission is provided from this point. The remote-control unit is not interchangeable with any other Navy type.

Power supply units are of three types, dynamotor, motor-generator, and rectifier. Starting relays for these units are contained within the power supply units, and are controlled from either the remote-control unit or panel switches in the transmitter and receiver.

Dynamotor operation is obtained exclusively from 12 volts D. C. Units of interchangeable operation are

available. Type 21770 is connected to the grounded terminal of the power source as indicated by the instructions on the unit. The types 21881 and 211035 are used with either power source lead connected to the grounded terminal. The high-voltage section of each unit has an input of 9.9 amperes at 12 volts, and an output of 0.180 ampere, at 400 volts. This supplies the



Model TCS transmitting-receiving equipment set up for operation. The antenna loading coil is mounted on top of the transmitter.

transmitter power amplifier and modulator stages. The low voltage section has an input of 3.8 amperes at 12 volts and an output of 0.100 ampere at 220 volts, and operates the transmitter oscillator and buffer-doubler stages as well as the receiver. When the dynamotor units are used, the filaments are operated directly from the power source.