

The RDZ Receiver

■ The model RDZ receiver, companion equipment to the model TDZ transmitter, will shortly be in large-scale production. This set will be the forerunner of an entirely new series of equipments designed for maximum utility and serviceability, but still retaining the sound basic engineering principles and features of the RBA, RBB, and RBC series equipments that have proven seaworthy under battle conditions.

This model RDZ is a 21-tube superheterodyne, employing crystal frequency control, to permit reception of amplitude-modulated signals on any one of ten pre-determined channels within the frequency range of 225 to 440 Mc. An automatic tuning unit is employed in the equipment to permit selection of channels either by local or remote control. Connections to and from the receiver are filtered to prevent possible interference from nearby electronic equipment.

The receiver chassis assembly consists of three separate sub-chassis assemblies secured together and affixed to the operating panel to form a composite receiver chassis-panel assembly. The three sub-chassis assemblies referred to above consist of an RF Amplifier Unit with associated crystal oven and automatic tuning unit, an IF/AF Amplifier Unit, and a Power Supply Unit. All input and output connectors and associated RF filters are contained in an assembly located in the rear of the cabinet.

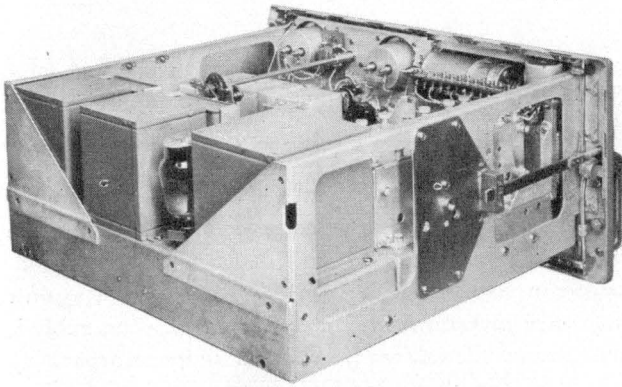
The RDZ has been designed and constructed to offer many mechanical features not found in previous ship-board communication receiving equipments. The cabinet and panel are devoid of all sharp edges and corners, giving the equipment a modern streamlined appearance and offering considerable protection to operating personnel. All front panel controls are contained in recesses in the panel as a protection against accidental movement or damage. The chassis assembly is mounted on file-cabinet-type drawer slides incorporating provisions for tilting and locking the chassis in the horizontal, vertical, or approximately 35-degree tilt positions, thus providing complete access to all component parts for servicing at the point of installation. The use of captive, quick-acting fastening devices for securing shield and cover plates precludes the loss of screws and expedites servicing operations. By the employment of specially designed panel-operated locking devices, thumb screws have been eliminated from the panel. The method employed for the attachment of the connecting cables permits the ready installation of two or more equipments in a common supporting frame in locations which do not provide wide clearances for access to cable connectors either at the sides or rear of the equipment.

The preselector unit of the model RDZ equipment consists of a double-tuned RF amplifier stage, a mixer or first-detector stage, and a crystal oscillator with the necessary frequency-multiplier stages required to produce the desired frequency at the mixer or first detector grid. Also mounted on the preselector unit are the automatic tuning mechanism and the crystal oven. The automatic tuning mechanism connects the desired crystal, located in the crystal oven, and tunes the receiver to provide reception on the desired pre-determined frequency. An intermediate-frequency transformer containing the primary of the first IF transformer circuit is located on the preselector chassis so that the coupling circuit between the RF unit and the IF/AF unit carries only intermediate-frequency currents.

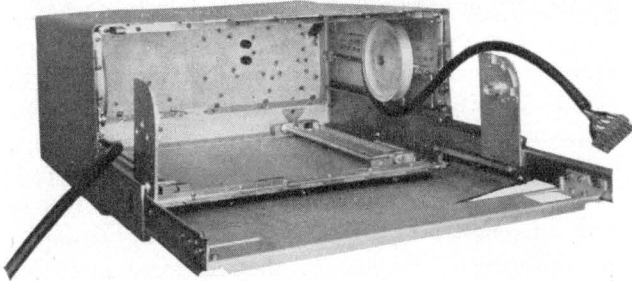
The IF/AF unit consists of a cathode follower for connection of a panoramic adapter, five stages of intermediate-frequency amplification at 15.1 Mc, a second detector, noise limiter, automatic volume control, silencer, silencer-amplifier, band-pass filter, a cathode follower for video output, and three stages of audio amplification. The panel of the IF/AF unit also contains a tuning-indicator meter and an output-power (db) meter.

The power unit employs a transformer, rectifier tube, B-supply filter network, and a voltage-regulator tube. These circuits are conventional and supply all the voltages required by the receiver when connected to a source of 110, 115, or 120 volts, 50 or 60 cycles, AC.

The input of the RDZ is designed to operate from either the antenna of the TDZ transmitter or the antenna



This view of the chassis-panel assembly shows the handle-operated locking device. Chassis may be locked when fully extended and, if desired, may then be tilted up 35° or 90° and locked in that position for servicing.

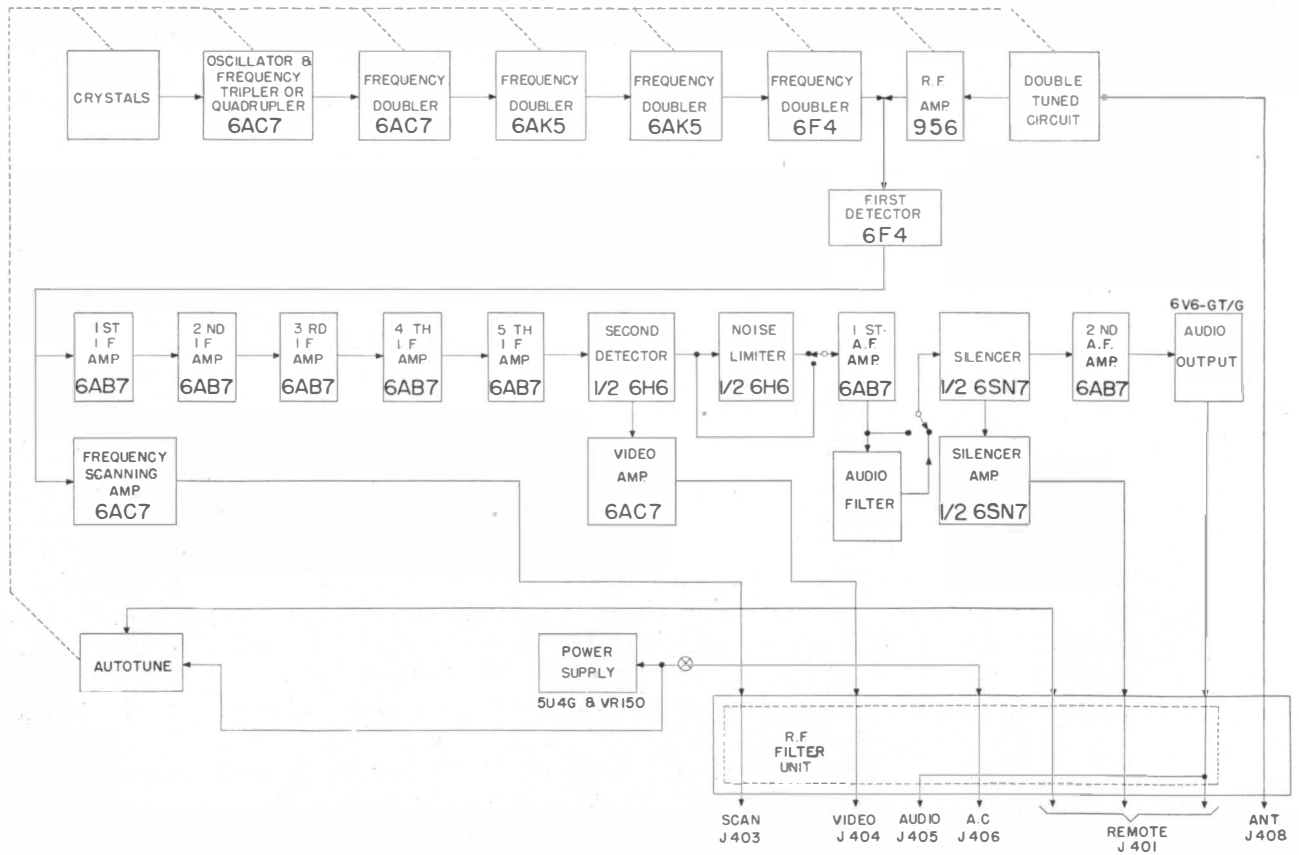


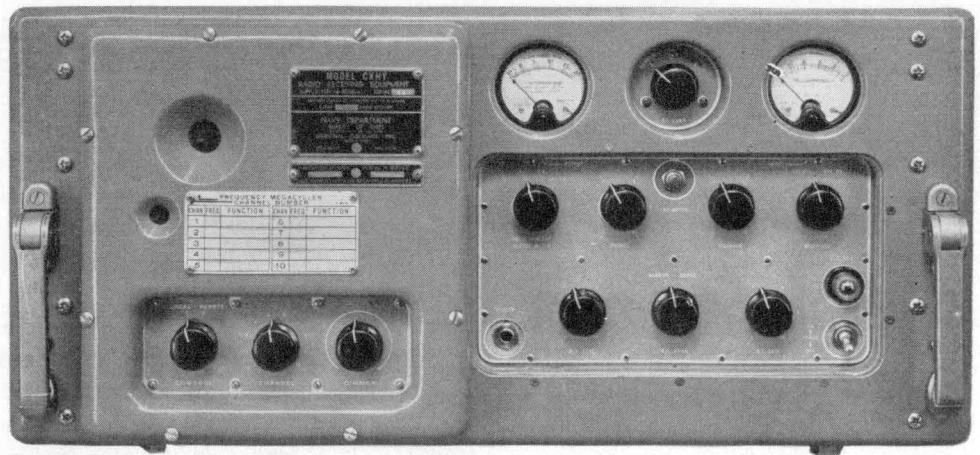
Front view of the RDZ cabinet with chassis-panel assembly removed to show details of the slide mechanism and cable take-up wheels. The cable filter assembly is shown in position at the rear of the cabinet.

furnished as an accessory with the equipment. The sensitivity of the receiver is less than 10 microvolts over its range. Two degrees of intermediate frequency selectivity provide for operation with either 200 or 400 kc minimum channel-spacing. The overall frequency instability does not exceed .015 per cent when employing CR-1 crystals or .007 per cent when employing CR-7 crystals in the crystal oven.

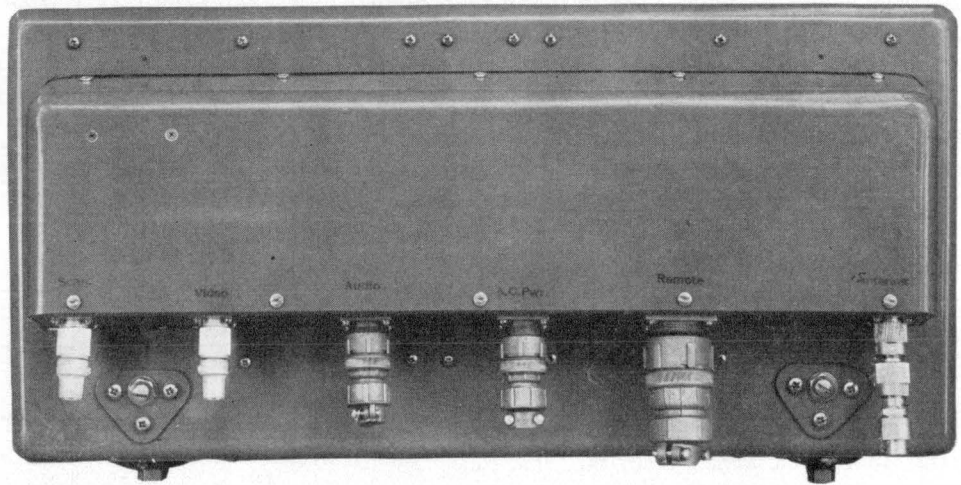
The nominal audio output impedance is 600 ohms, but the inclusion of degeneration in the audio amplifier permits a number of 600-ohm loads to be connected in parallel across the output terminals without serious reduction in volume.

An interesting sidelight to the development of this equipment lies in the fact that the majority of components employed in the preselector unit had to be specially designed for this receiver. The range between 200 and 400 Mc has proved to be too high for standard components normally employed in lump circuits and too low for practical use of tuned stubs or lines. The RDZ employs lumped tuned circuits. The variable tuning elements are a special form of butterfly (floating-rotor) capacitors with the frame elements arranged to reduce inductance to a minimum. Note to RT's: Please respect this capacitor as you would your lungs, because this particular megacycle separator costs \$40 per section!

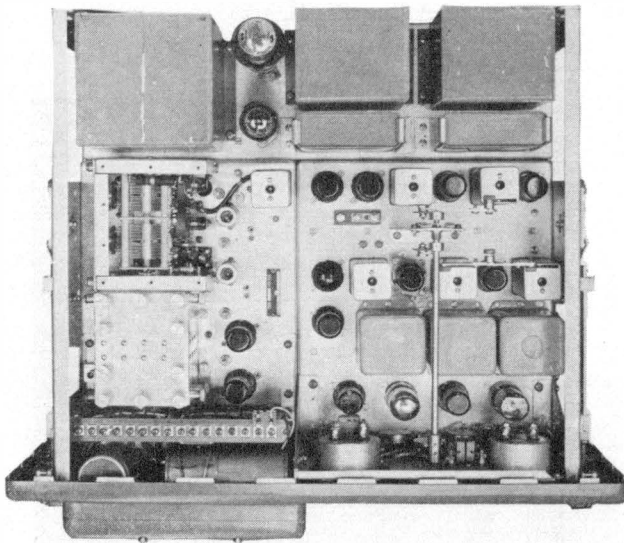




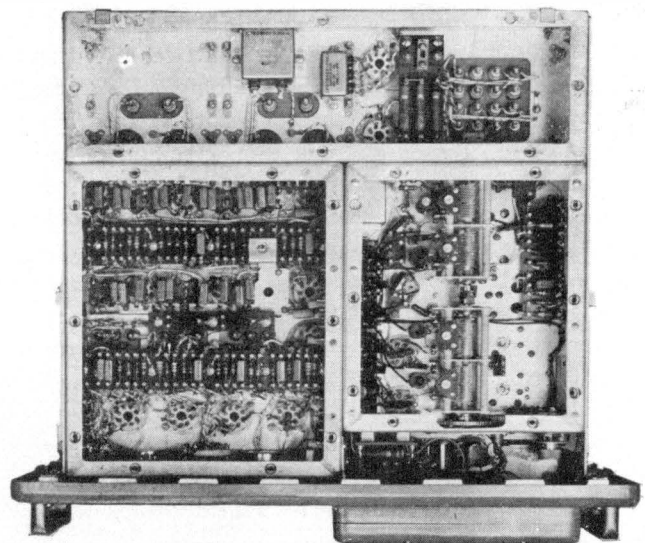
The front panel of the RDZ presents a very neat appearance. Note the rounded corners and recessed controls.



Rear view of the Model RDZ cabinet showing the cable filter blister and location of the various cable connectors. The blister cover can be removed from the back to provide access to the filter components, or the complete filter may be removed through the front of the cabinet.



Top view showing the preselector chassis (left front), the IF/AF chassis (right front), and power supply (rear). The automatic tuning mechanism is located behind the front blister.



Bottom view of the RDZ chassis showing arrangement of components to provide maximum accessibility.