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September 1988

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EQUIPMENT HIGHLIGHTS

RADIO INTERFACE UNITS

Prepared by

Defense Test and Evaluation Support Agency
Kirtland AFB, New Mexico 87117-5000

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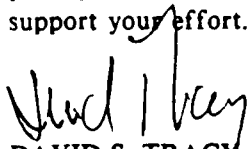
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Your comments and suggestions regarding this series of reports are solicited. DTESA invites your participation in this exciting new program and challenges you to test our capability to support your effort.


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Per Ms. Linda Deal, DTESA/ROFI

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RADIO INTERFACE UNITS

DESCRIPTION

The Radio Interface Unit (RIU) and its predecessor, the Special Radio Interface (SRI), were developed to provide regulated power to operate various types of foreign radio systems and to provide an interface between the radio's microphone input and headset output, allowing the radio to be operated with standard domestic headsets and microphones. The RIUs also provide an interface that allows communications to be recorded on a standard audio tape recorder. In addition, most types of RIUs allow the operator to monitor the relative volume units (VU) of the received and transmitted audio via a front panel light-emitting diode (LED), bar graph VU meter.

The RIUs and SRI provide operational flexibility through the use of a main printed circuit board (PCB) that contains amplification and switching circuitry and small secondary ("daughter") PCBs, each designed for a particular radio system, that plug into the main PCB. The secondary PCBs ensure proper interface characteristics for the radio system in use.

The RIUs and SRI operate off standard 110-Vac, 50/60-Hz line voltage; some RIUs may be operated off an external 24-Vdc source.

The foreign radio systems supported by the SRI and various RIUs include:

R-105D	R-105M
R-107	R-118
R-123	R-130
R-405	R-407
R-802G	R-832

TECHNICAL CHARACTERISTICS AND CAPABILITIES

RIU FEATURES

The standard RIU (Figure 1), which can be rack mounted or table mounted, measures 17 inches wide (19 inches with front panel) by 19 inches deep by 7 inches high and weighs 36 pounds. Features of the RIU include:

1. Transmit audio processing and key processing circuitry and controls for audio transmissions using a hand-held push-to-talk microphone, headset microphone, recorder, or 600-ohm input,
2. Receive radio processing to speaker, headset, recorder, and 600-ohm output,
3. Sidetone audio generation for monitoring audio transmissions,
4. Voice actuated transmission (VOX) operation of headset microphone, and
5. VU meter indication of transmitted audio or 600-ohm output signal level.



Figure 1. Standard RIU

Input Audio Processing

Audio signals input to the Standard RIU from the hand-held push-to-talk microphone, headset microphone, audio recorder, or 600-ohm input are amplified by a gain-adjustable differential amplifier on the main PCB and routed to the secondary PCBs for conditioning and impedance matching. The audio signal is then routed to the attached radio through rear panel connections.

When the Standard RIU is operated in the MODULATION mode, the relative strength of the output audio signal to the radio is indicated on the front panel VU meter. The TRANSMIT KEY indicator illuminates whenever the transmit key relay is actuated as a result of push-to-talk microphone or VOX operation.

Radio Output Audio Processing

Signals from the radio are received through the rear panel interfaces and routed to the secondary PCBs for conditioning and impedance matching before amplification and connection to the selected output (speaker, headset, recorder, or 600-ohm mode). When the RIU is operated in the 600-OHM OUT mode, the VU meter indicates the relative strength of the 600-ohm output signal and allows the user to maintain this level at 0 dBm.

Sidetone Audio Generation

Sidetone audio generation allows users to monitor audio transmissions. Amplification is provided by an operational amplifier through the transmit key relay and then is applied to the speaker and headset amplifiers. The front panel SIDETONE VOLUME control is used to minimize audio feedback between the microphone and front panel speaker.

VU Meter

The VU METER display is a bar graph that indicates the relative strength of the transmit audio signal or the 600-ohm output signal. In the MODULATION mode, the transmit audio amplifier output is sampled, and the signal level is indicated on the VU METER display. The sampled signal is compared with a reference voltage and rectified, and a logarithmic resultant signal is applied to the bar graph display. The VU meter is calibrated so that the last bar graph "tics" correspond to transmitter saturation.

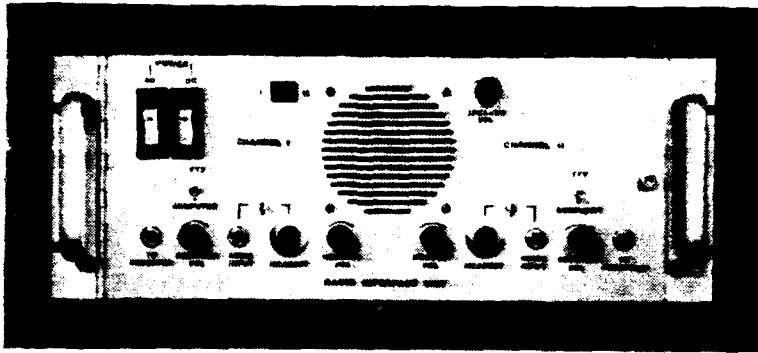


Figure 2. Dual-Channel RIU

VOX Operation

During VOX operation, a series of amplifiers control the voice level needed to actuate the transmit key relay automatically. Controls and adjustments for VOX operation are located on the main PCB and are not accessible during normal operation.

DUAL-CHANNEL RIU

A dual-channel RIU (Figure 2) has been developed for use with the Soviet R-405 radio. The dimensions of the dual-channel RIU are the same as those for the standard RIU; however, the dual-channel RIU weighs only 22 pounds.

Features of the dual-channel RIU include:

1. Transmit audio processing using headset microphones and recorder,
2. Receive radio processing for speaker, headset, and recorder, and
3. Teletype (TTY)/computer data transmission.

Amplification, conditioning, and impedance matching circuitry for the dual-channel RIU is similar to that for the standard RIU. However, additional circuitry in the dual-channel RIU permits interfacing TTY data formats and computer data formats (digital signals) with the R-405. The computer data-handling function is not currently operational on the dual-channel RIU.

The dual-channel RIU operates only on standard 110-Vac power. The 110-Vac power is routed to the internal cooling fan and the 12-Vdc power supply and, in future configurations, to the primary of a 110-Vac to 220-Vac step-up transformer. The 12-Vdc power supply furnishes ± 12 Vdc to the main PCB audio amplifier and conditioning circuit. Future dual-channel RIUs will provide 220-Vac output power to operate external radios and TTY.

REMOTE OPERATION USING RIU

A variation of the standard RIU can be used with a Remote Control Unit (RCU) to provide remote operation of the Soviet R-118 radio station via either a field telephone or the R-105 series frequency modulated (FM) radio transceiver.

AVAILABILITY

RIUs are available for use by the DoD and other Government agencies. Inquiries regarding availability, scheduling, logistics, and costs should be directed to DTESA/RQ, Kirtland AFB, NM, 87117-5000, telephone 1-800-445-6910 or (505) 842-0271.

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