SALES SERVICE BULLETIN NUMBER 131

Model TDR-2 Triple Diversity Rec iver

The Model TDR-2 Triple Diversity Receiver consists of three Hammarlund SP-600 X communications receivers which have been modified to TMC specifications, ass mbled in a deluxe 84" relay rack with all of the necessary associated equipments which have been found to be most desireable in a triple diversity rec iving system. An unusually special feature of this receiver is a visual method of monitoring the receiver tuning.

The Model TDR-2 is designed to receive radio signals within the range of 54 to 54.0 mcs., modulated in any one of the following manners:

a. Amplitude Modulated broadcast or telephone.
b. Frequency Shift radio teletype
c. CW
d. MCW

Reception of telephone or broadcast signals is accomplished by the three receivers in space diversity. The signals as detected at the second detector of the receivers are fed to the combining unit where they are combined in a common diode load and audio amplifier. The combined output may then be patched to any desired external circuit.

When receiving frequency shift teletype intelligence the receivers are operated individually with common high frequency and beat frequency oscillator voltages. The audio outputs of the receivers are than patched into a frequency shift converter. Diversity combination is accomplished within the frequency shift converter, the output of which may be fed into a teleprinter or other external equipment.

Reception of CW signals is accomplished in diversity in the same manner as for telephone above. The combined and rectified CW pulses are passed through filtering and biasing circuits to excite a local tone keyer. The keyed audio tone from the tone keyer may be patched to any external receiving device.

With the reception of MCW signals the receivers are operated individually as with frequency shift except that no receiver beat frequency oscillator is utilized. The detected tones from the audio outputs of each receiver are fed to the combining unit where they are individually rectified and mixed in a common diode load. The detected CW pulses are then used to excite the local tone k yer as in CW reception.

Th Automatic Volume Control Circuit in this equipment may be operated either individually or connected to a common buss in the combining unit. This method offers maximum flexibility of operation.

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TECHNICAL SPECIFICATIONS:
(By individual component units)

SP-600 Receivers (modified)

Frequency Range:	.54 to 54.0 mcs in six bands, continuously variable.
Maximum Undistorted Output:	2.5 watts (approx)
Output Impedance:	600 ohms balanced split windings Phone-jack winding: delivers 15 miliwatts to an 8000 ohm resistive load, when the audio output to the 600 ohm power load is adjusted to 500 milliwatts.
Power Supply Requirements:	
Line Rating:	95, 105, 117, 130, 190, 210, 234, and 260 volt taps, 50/60 cycle.
Power Consumption:	130 watts, 1.25 amps at 117 volts-maximum.
Tube Complement: (total 20)	7 ea 6BA6 RF,IF and BFO amplifiers 3 ea 6C4 RF, 2nd Conversion and BFO Osc. 1 ea 6AC7 Crystal Controlled HF Oscillators. 2 ea 6BE6 Mixers 3 ea 6AL5 Detector, "C" Bias Rectifier, & Noise limiter and meter rectifier. 1 ea 12AU7 AF Amplifier and IF output 1 ea 6V6GT Power Output 1 ea 5R4GY Rectifier 1 ea OA2 Voltage Regulator
Physical Dimensions:	19" wide x 10 1/2 " high x 16 1/2" deep. Weight is 66 pounds net.
Performance Data:	
Sensitivity:	2.3 microvolts (s/n ratio of 10:1)
Image rejection:	Better than 80 db throught freq. range.
IF rejection ratio:	(600 kc) 2700:1
AVC Circuit:	Provides time constants as follows: Slow .5 seconds Meduim .1 " Fast .01 "
Oscillator Circuits:	The HFO, BFO and second conversion oscillators are modified to provide for: a. External Oscillator injection. b. Slave operation (Rec/1 oscillators supply receivers /1 and /2).
Components and Construction:	Equipment is manufactured in accordance with JAN specifications wherever practicable.

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Model DCU Diversity Combining Unit

The Diversity Combining Unit, Model DCU which is designed for use in the Model TDR-2 receiver provides facilities for (a) combining IF voltages of the three receivers in common diode load for keying of self contained sing frequency tone keyer; (b) combining IF voltages fo three receivers in common load for diversity mixing in detection of audio and broadcast signals; (c) connecting the IF outputs or the audio outputs of the receivers to a frequency shift converter; (d) detection and diversity combination of MCW signals for keying self-contained tone keyer.

Metering is provided for indication of signal level of each receiver. Combining facilities are provided for control of AVC voltages of the three receivers. A VU meter isprovided for monitoring the audio level of the audio circuits.

IF Input:	455 Kcs IF from each receiver.
Audio Input	600 ohm audio from each receiver.
Control Input:	AVC voltages from each receiver.
Output:	1. 455 Kcs IF to IF converters. 2. Single frequency tone for feeding a line or ink-tape recording equipment from a cw or mcw signal, 600 ohms 3. 600 Ohm audio from each receiver. 4. 600 Ohm audio from combined diversity load. 5. Combined AVC voltage.
Metering:	1. Three meters in series with seperate diodes to indicate signal level from each receiver 2. One VU meter to indicate level from all audio circuits.
Controls:	1. Primary power switch 2. AVC bias switch 3. CW-MCW bias adjust 4. CW-MCW threshold control. 5. Level meter range switch 6. Level meter selector switch 7. Speed control.
Tubes:	All JAN miniature types
Size:	19" wide x 14" deep x 7" high.
Primary power:	110/220 volts 50/60 cycles
Components and Construction	Equipment is manufactured to JAN specifications wherever practicable.

We reserve the right to make engineering changes in these specifications when required.

Model DVM Diversity Visual Monitor Unit

This unit provides a calibrated oscilloscopic presentation on a 3" cathode ray tube showing a circular pattern with the received signal indicated as a pip on this pattern. Visual indication of the background noise and adjacent channel interference is also shown. The frequency of the desired signal is indicated with respect to the center of the pass band of the picture.

Input	Three 70 Ohm coaxial connectors to accomodate three receivers with 455 Kc IF. (any one to be selected by front panel switch).
Input Level:	10 millivolts across 70 ohms minimum
Output:	1. Visual indication of signal condition and receiver tuning on 3" CRT. 2. Signal of sufficient level for earphones, available at phone jack.
Compunents and Construction	Equipment is manufactured in accordance with JAN specifications wherever practicable.

We reserve the right to make engineering changes in these specifications when required.

Model D C P

Power Control Panel

Size:	3 1/2" high x 19" wide x 5" deep
Contents:	1.7 1/2 amp circuit breaker 2. Pilot light terminal block 3. Two Convenience outlets

Note: Auto transformer or voltage regulator may be mounted in base of rack, if required.

Model L S P

Loudspeaker Panel

Speaker :	8" diameter
Input:	High Impedance bridging amplifier with volume control
Tubes:	1 - 6X5 1 - 12AU7
Power:	110 volts 50/60 cycles 25 watts
Size:	19" wide x 8 3/4" high x 5" deep

Model L P P

Patching Panel

Jacks:	48 closed circuit jacks.
Patch cords:	Sufficient for operation and spares.
Size:	19" wide x 8" deep x 3 1/2" high

Model DCO

Diversity Control Unit

The Diversity Control Unit, provides facilities for crystal control of high frequency oscillator, beat frequency oscillator and second conversion oscillator of the receivers. The high frequency oscillator crystals are accessible from the front of the panel. Isolation stages for isolation of the receivers is provided. Provisions are made for external oscillator input.

Output:

1. HFO 10 crystals with incremental frequency trimmer across crystal switch, 2 to 6 mcs. on fundamental, 6 - 30 mcs. on harmonics.
2. BFO Two crystals, one above, and below 455 kcs. for sense inversion in frequency shift operation.
3. 2nd Conversion Oscillator - 1 crystal at 3500 kcs.

Output Impedance: 70 ohms

Crystal Holder: FT 243

Controls:

1. Primary power switch
2. HF crystal selector switch
3. HF crystal frequency trimmer.
4. BFO Crystal selector switch
5. Standby switch.

Power requirements: 110 volts, 50/60 cycles, 50 watts.

Size: 19" wide x 14" deep x 5 1/4 " high.

Tube Complement:

1 each 6J6 HFO and buffer.
1 each 6J6 HFO and buffer
1 each 6J6 2nd Conv. and buffer
3 each 6AK5 HF Amplifier
3 each 6AU6 BF Amplifier

Componants & Construction: Equipment is manufactured in accordance with JAN specifications wherever practicable.

We reserve the right to make engineering changes in these specifications when required.