

DATE 2/5/58
SH. 1 OF 9
COMPILED BY
P. L. K.

TMC SPECIFICATION NO. S-354

TITLE: PRELIMINARY INSTRUCTION MANUAL MODEL MSR-3

JOB

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P.L.K. [Signature]

PRELIMINARY INSTRUCTION MANUAL

MODEL MSR-3

CK-352 Schematic Diagram

CK-353 Block Diagram

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I. PURPOSE:

The TMC model MSR-3 is a filter type adapter which can be used with any receiver to permit the reception of AM, SSB, CW, and FS signals. The adapter can also be controlled from a remote position in conjunction with the RCR system. This type of system permits flexible control of both the tuning and control of the MSR-3 with no additional telephone lines required. The presence of a sharp bandpass filter and a variable frequency mixing circuit in the MSR-3 provides sharp discrimination between the desired signal and any undesired interference.

II. DESCRIPTION:

The TMC model MSR-3 incorporates a number of unique features. An AVC system provides independent control of the signal above that incorporated in the receiver, thereby preventing overloading of the adapter unit. The first oscillator can be either crystal controlled for stability or variable for tuning purposes. In the Manual position the oscillator can be controlled remotely by the RCR system. Lamps on the front panel indicate either sideband, while a tone (produced with BFO-ON) indicates remotely by pitch, high for UPPER, low for LOWER. Remote or local selection of either sideband is permitted in either the XTAL or Manual position. The second oscillator or BFO, which reinserts the carrier, can be turned on either locally at the equipment or remotely. Noise limiter circuit removes noise peaks making the signal more understandable. The audio stage provides output for either high level line, low level line, loudspeaker or headphones.

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III. OPERATION

A. Description of Controls.

Manual-XTAL Switch

The Manual/XTAL control provides either manual control or crystal control of the 1st oscillator

Upper/Lower Sideband Switch

Sideband control permits selection of either upper or lower sideband by operation of push button switch. This control selects either sideband whether the first oscillator is manually turnable or fixed crystal.

Bandspread Control

The Bandspread control tunes the 1st oscillator over a limited range of approximately ± 3 KC's.

BFO Switch

The BFO switch turns on the second oscillator.

AVC On-Off Switch

The AVC switch provides AVC control of the IF amplifier in the MSR-3.

AVC Fast-Slow Switch

The Fast-Slow switch permits AVC control for either rapidly fading signals or slowly fading signals.

Noise Limiter Switch

The Noise Limiter switch places in operation a limiter which effects both positive and negative peaks.

Output Level Switch

Controls High/Low Output Level. (Disconnects Telephone lines when in High position.)

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Audio Gain Control

The Audio Gain control effects the output of the Audio Amplifier stage. A phone jack provides monitoring of the Audio output with no effect on the line.

B. Operation of Controls:

1. General

In tuning the MSR-3 the thought must be kept in mind that a sharp band pass filter is in operation at all times. The receiver tuning must place the desired signal within 3 KC of the pass band of the filter. Since the MSR-3 has its own Audio Amplifier there is no need for the Receiver's Audio Amplifier except as a monitoring device. AM signals may be received either as a carrier with one sideband or as an exalted carrier signal. In the first case (carrier with one sideband) the BFO in the MSR-3 is turned off and a slight detuning of the Bandsread control then permits the carrier plus one sideband to pass the filter. If interference is found, then switching sidebands will place it on the opposite side of the carrier. Detuning of the Bandsread control is again required. For exalted carrier operation the BFO switch is placed at ON. Retune the Bandsread control to obtain a zero beat of the carrier with the BFO. Switching sidebands to eliminate interference will now require no retuning of the Bandsread control.

For SSB reception the BFO is left on. The Bandsread control is tuned to obtain the most natural sounding voice. If still garbled, switching sidebands will place the inserted.

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carrier in the correct position with relation to the sideband.

For CW reception the BFO is left ON. The desired audio tone is obtained by tuning the bandsread control.

2. Remote Operation:

When used in remote operation the MSR-3 AVC switches should be placed to ON and Slow. Remote operation of the MSR-3 requires the use of the RCR receiving system. The important functions of the MSR-3 controls are duplicated by the controls found on the RSC (Control Unit).

The HFO control is available for other functions.

The BFO controls the 1st Oscillator within the MSR-3. It tunes the Bandsread control only while the RSC BFO switch is ON. When it is OFF the MSR-3 Bandsread is returned to its initial position.

With the RSC AVC switch at OFF the RF Gain control, properly manipulated, operates the MSR-3 sideband selector.

The MSR-3 sideband selector is operated as follows with RSC AVC switch OFF:

1. Turn RF Gain control fully clockwise to 10

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(This places sideband switching relay in receptive condition).

2. Turn control fully counter clockwise to 0 and hold for 1 second. (This serves to switch sidebands).
3. Return control to normal position for desired gain.

The RSC Audio Gain controls the gain of the audio signal introduced into the RSC from the MSR-3.

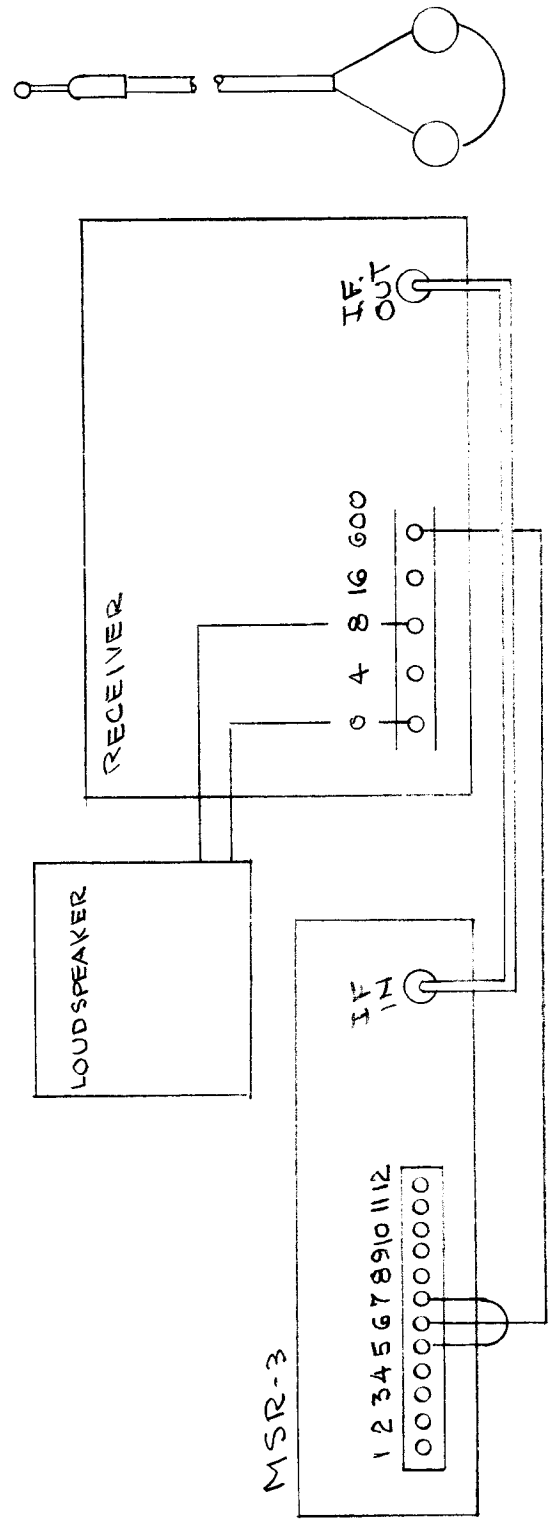
3. Remote Tuning. (RSC)

Remote tuning of AM signals requires the tuning of the receiver. With the BFO switch off, the BFO control is ineffective. Therefore, to tune the desired signal into the passband of the MSR-3, the receiver must be tuned.

Remote tuning of SSB signals requires the BFO to be ON. Now the beat note can be varied by tuning BFO control until natural sounding speech results. Judicious centering of the signal in the passband by tuning the receiver will make the proper tuning of the BFO much easier.

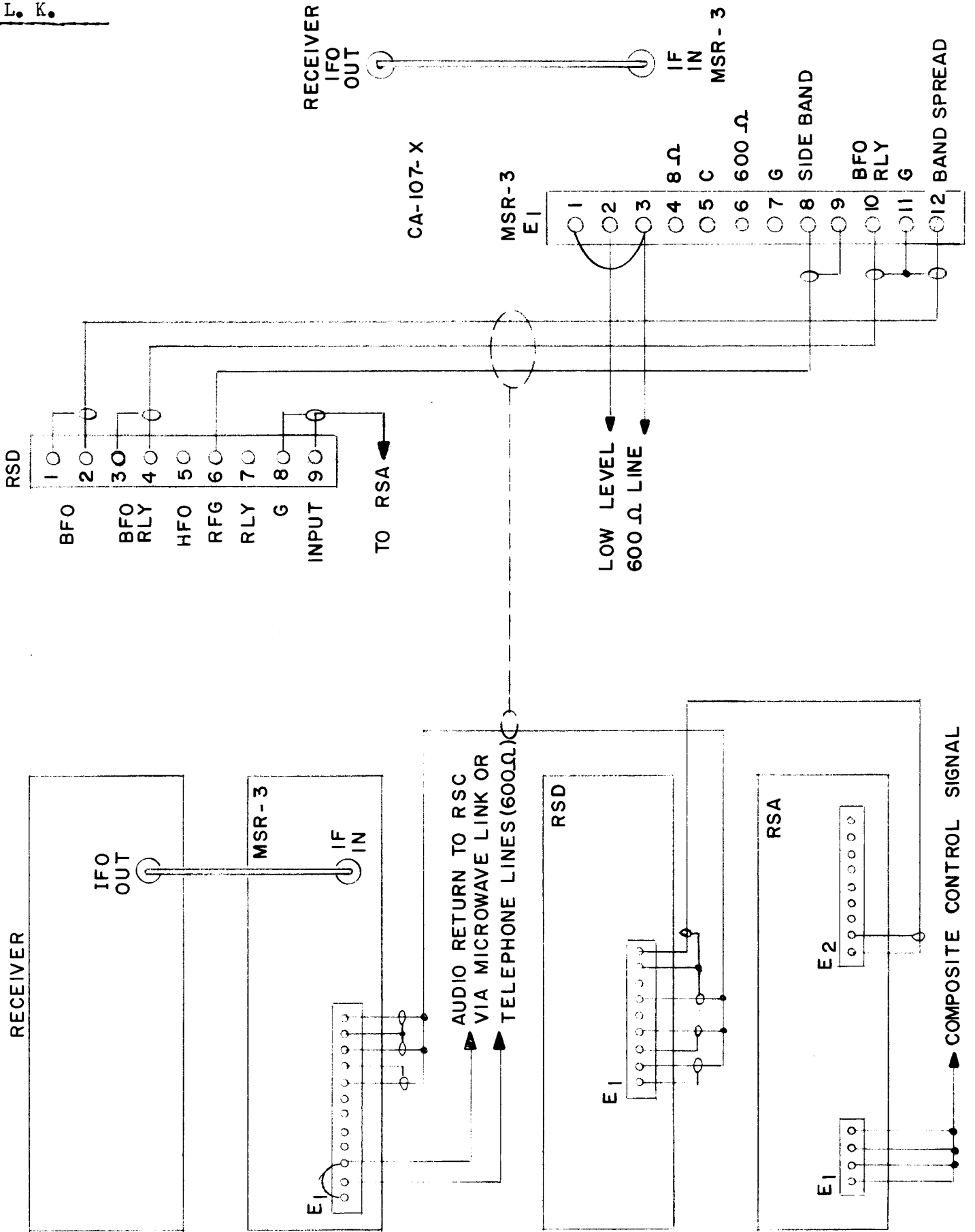
Remote tuning of Exalted Carrier AM can be accomplished in the same manner. The signal is correctly placed in the passband when switching sidebands produces no beat note change.

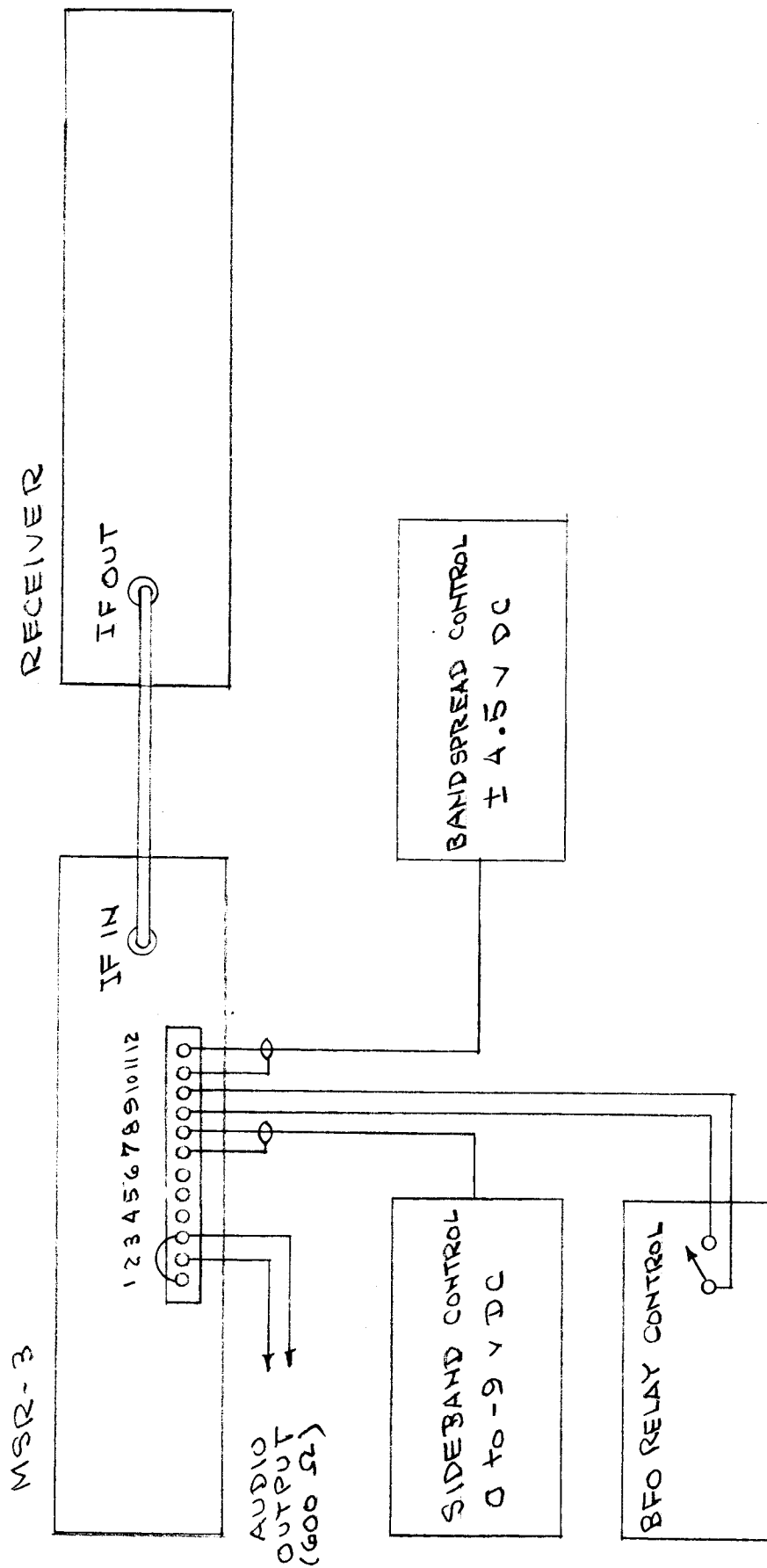
Remote tuning of a CW signal requires a slight detuning of the signal to pass through the bandpass filter.



SINGLE LOUDSPEAKER OPERATION

1. Interconnect 5 and 7 of MSR-3.
2. Connect 6 of MSR-3 to 600 ohm output on receiver. If no 600 ohm output is available on receiver, connect 4 of MSR-3 to 8 ohm tap on receiver.
3. Connect loudspeaker across next higher impedance tap on output terminals of receiver.
4. Connect I.F. cable between MSR and receiver.
5. Output of each unit controlled by its own audio gain control.





REMOTE CONTROL OF MSR-3 IN RCR SYSTEM