



## INSTALLATION AND ADJUSTMENT

### FOR

## MASTR PROFESSIONAL RADIO CONTROL BASE STATIONS

### (OPTIONS 7462, 7463, 7464 & 7465)

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Radio control base stations are used in two-way mobile radio systems to increase the radio coverage area. A typical system, illustrated in Figure 1, consists of a control station, a repeater station, a repeater base station and the mobile units. In the diagram, "R1" is used to indicate a receiver on frequency F1, "T2" is used to indicate a transmitter on frequency F2, etc. F1 is the mobile frequency; F2 is the up-link frequency and F3 is the down-link frequency. Notice that all calls between the control station and the mobiles are automatically retransmitted by the base station or the repeater station.

The purpose of this publication is to supplement the installation instructions for MASTR Progress Line station combinations to cover radio control base station options. The application of each option is shown in the following chart.

OPTION NO.	APPLIES TO:
7462	Repeater Station only.
7463	30 to 100-Watt repeater base station
7464	25-174 MHz, 330-Watt repeater base station
7465	450-470 MHz, 250-Watt repeater base station

### DESCRIPTION

#### "TALK-OUT" OPERATION

To call a mobile unit, the dispatcher transmits on T2 at the control station. This signal is received by R2 at the repeater station and the audio output of the receiver is tailored by the audio coupler circuit on the control panel to modulate the repeater base station transmitter. The Carrier-Operated Switch (COS) located on the repeater station control panel, keys T1, retransmitting the call to the mobiles. An optional 3-minute timer prevents T1 from remaining on the air for longer than 3 minutes.

#### "TALK-BACK" OPERATION

When a mobile unit transmits, the call is received by R1 in the repeater base station, which keys T3 by means of the COS repeater base station control panel. The audio coupler circuit on the repeater panel tailors the receiver audio to the transmitter input. T3 automatically retransmits the call to the control station, where it is heard by the dispatcher. A 3-minute timer (on the repeater Control Board prevents T3 from remaining keyed for longer than 3 minutes. A 5-second delay relay holds T3 keyed for 5 seconds after the termination of each transmission from a mobile unit. This improves communications while a mobile unit is transmitting in a "flutter zone" or fringe area.

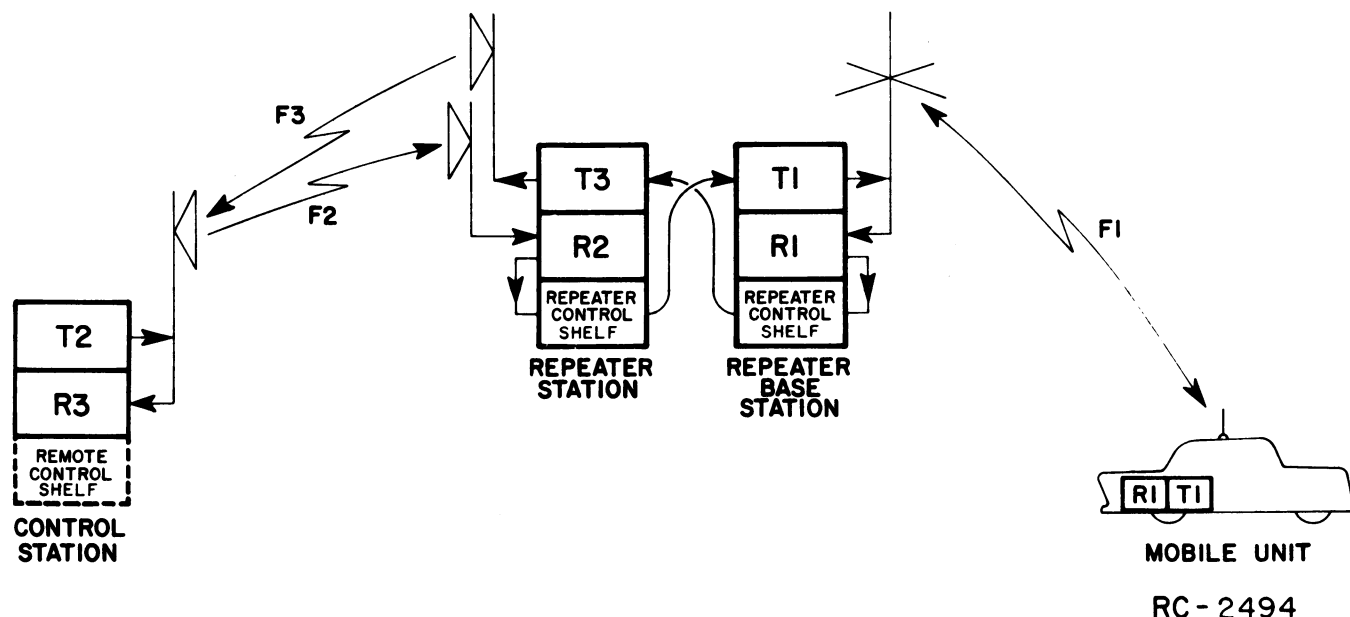


Figure 1 - Typical Radio Control Base Station System

### ANTENNAS

Note that directional antennas can be used by the repeater station and the control station to provide more gain and more protection from interference. The repeater station must use separate antennas for the transmitter and receiver; so that the repeater base station transmitter (T1) can always be keyed from the control station (providing supervisory control) --- even if T3 is being keyed by a signal from one of the mobile units. The repeater base station transmitter and receiver usually share an omni-directional antenna in PTT operation.

### INSTALLATION

Install the stations as directed in the standard installation manual. However, make the antenna connections for 60 to 100-Watt repeater base stations (option 7463) as shown in Figure 2.

Connect the two 25-foot cables (19B219732G1) from the control shelf of one station to the power supply of the other station (see Figure 2). The audio output and transmitter keying connections between TB502-10, -12, -13 (on the EP-38-A), and J1201-1, -2 and J1202-4 (on the control shelf) have been removed on the standard wiring harness for connection of these cables.

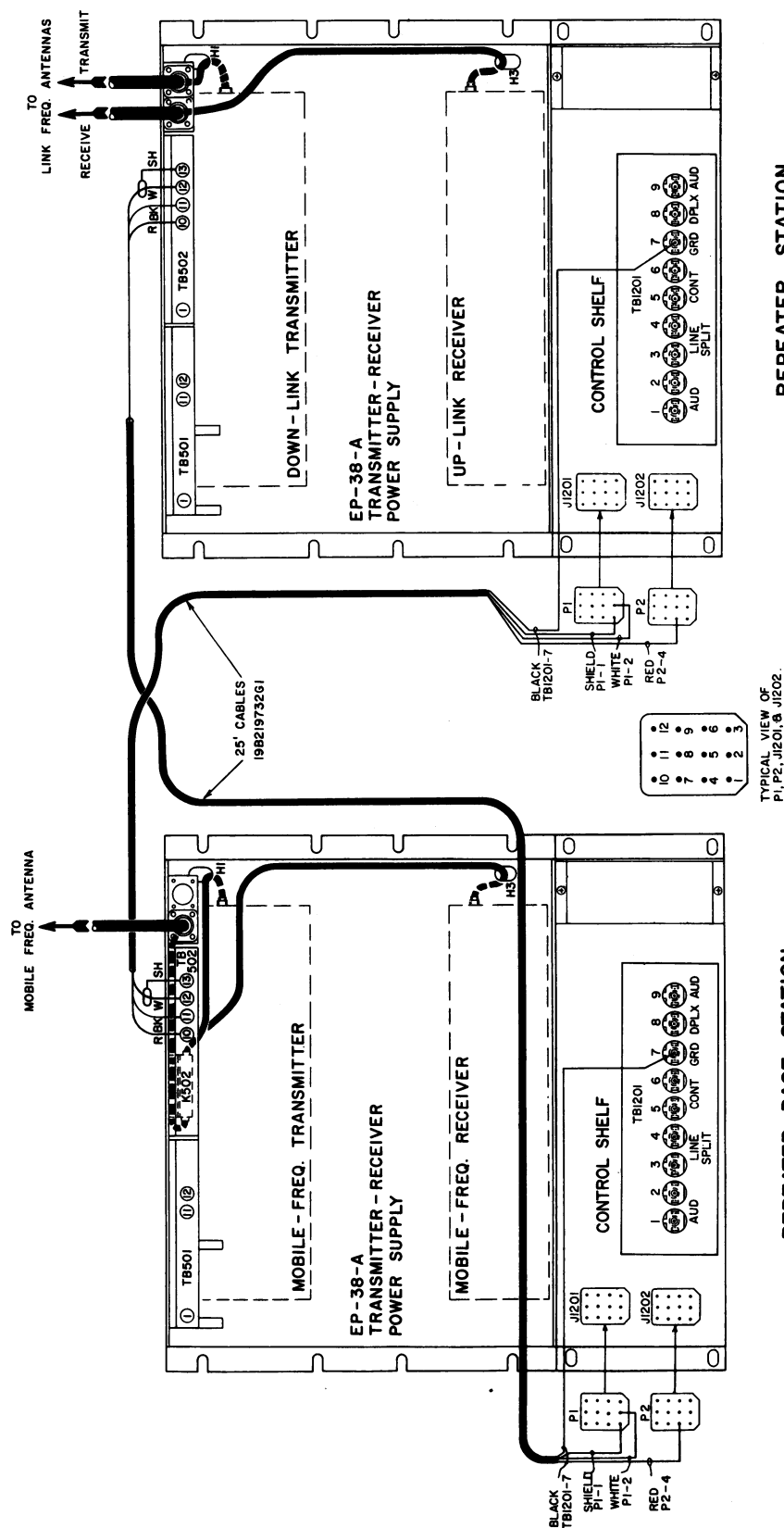
### ADJUSTMENT AND TEST

Follow the standard adjustment procedure in the maintenance manuals for the base station and repeater station, except for the adjustment of the AUDIO COUPLER LEVEL control on their control shelves. After all other adjustments have been completed, adjust the AUDIO COUPLER LEVEL on both stations as follows:

PROCEDURE	CHECKOUT
<p>Feed test signal with 2/3 deviation (<math>\pm 3.3</math> kHz for narrow band, <math>\pm 10</math> kHz for wide band) at 1000 Hz into repeater</p> <p>Adjust AUDIO COUPLER LEVEL control (on Audio Board) on repeater base station control shelf so that repeater station xmtr (down-link frequency) is modulated at 2/3 deviation (<math>\pm 3.3</math> kHz for narrow band, <math>\pm 10</math> kHz for wide band).</p> <p>Remove signal.</p>	<p>Repeater station xmtr should key and be modulated by tone.</p> <p>Xmtr should unkey after 5 seconds.</p>
<p>Feed test signal with 2/3 deviation (<math>\pm 3.3</math> kHz for narrow band, <math>\pm 10</math> kHz for wide band) at 1000 Hz into repeater station receiver (up-link frequency).</p> <p>Adjust AUDIO COUPLER LEVEL control (on Audio Board) on repeater station control shelf so that repeater base station xmtr (mobile frequency) is modulated by 2/3 deviation (<math>\pm 3.3</math> kHz for narrow band, <math>\pm 10</math> kHz for wide band).</p> <p>Remove signal.</p>	<p>Repeater base station xmtr should key and be modulated by tone.</p> <p>Xmtr should unkey immediately.</p>

## NOTE

A signal/noise ratio improvement may be obtained in many situations, especially noisy areas, by adjusting the audio coupler output 4-6 dB higher than that required for 2/3 system deviation.



REPEATER STATION

**RC-2495**

REPEATER BASE STATION

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