

## Operation Manual for Converted Repeater units by Karl Shoemaker, AK2O

### Introduction

It's assumed you have experience in servicing 2-way LMR radio equipment, specifically the Motorola Mitrek radio. It's also assumed you have read and performed the conversions for this radio into a repeater or link unit. If you have not already done so, install the new (compensated) channel elements on your frequencies and align both the transmitter and receiver sections to optimum performance. Inside the radio the metering sockets are still functional. Refer to the OEM service manual for alignment and testing. The front panel controls and indicators will assist you in this task.

### Front panel

The controls are layout in a logical manor with associated indicators nearby. For example each toggle switch indicates the action with an LED indicator, colored appropriately for each function. From left to right, top-down:

Switches for MAIN power, PA power, PTT enable, PTT lock-on, and local speaker enable, plus a momentary push button for unsquelch/monitor. The LED indicators below are for each of these controls and appropriately colored. Some flash as well. Below are the volume and squelch knobs. The latter has some suggestive dots with threshold, and some operating settings. Below are the AGC meter, local mic jack and terminal block strip, TB-1. The local mic pins 1~4 are (conventional) mic hi, PTT, +12v accessory power and ground. Mic audio is high-level as in the stock Mitrek radio.

### Switches

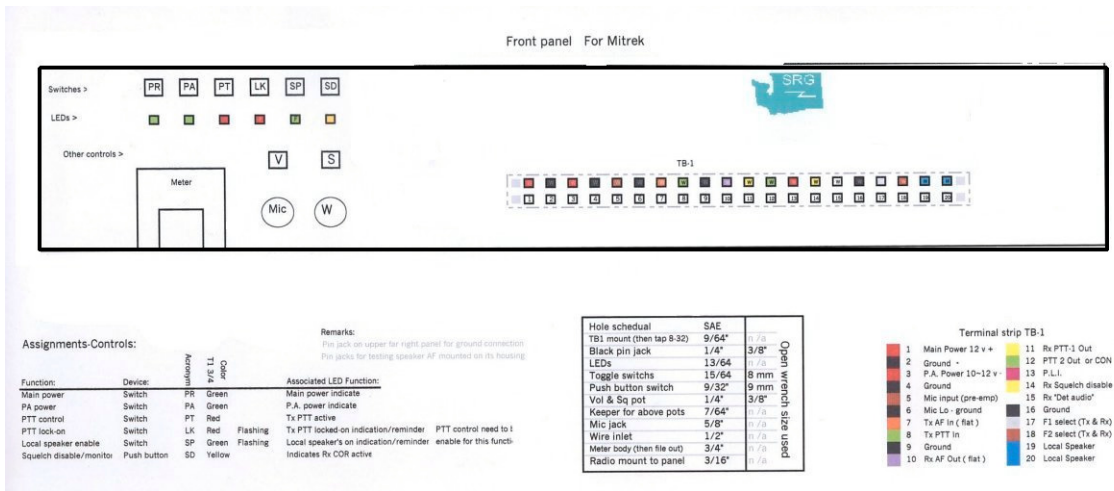
- The main power switch enables all of the Rx sections, and Tx exciter sections, except for the final PA output. This may be useful testing the transmitter, but without power on the air, for frequency and audio level. A green indicator displays power to these sections of the radio. Normal condition is ON position.
- The PA power switch enables power out of the transmitter at rated power. Also note the main and PA power are separate inputs on TB-1. This allows custom voltage for the PA. SRG design lowers the PA voltage to 10 on some high power stations for cooler operation. If you don't wish this, a simple jumper between the terminals powers both sections in a conventional manor. A green indicator displays power to these sections of the radio. A dimly lit indication shows the power is off for this section. Normal condition is ON position.
- The PTT switch enables outside world via TB-1 or the cor board to key the transmitter. A red indicator shows when PTT is active. There is also another red indicator inside the radio, near the RF ports for the same reason. Normal condition is ON position.
- The PTT lock-on switch is useful when testing the transmitter under power without the use of a "clip lead" to keep it keyed. When the lock is on a red indicator flashed to remind you this abnormal condition, even if the other PTT enable switch is off. Both PTT switches need to be on for this function to occur. The local mic's PTT bypassed these switches. If both switches are off the transmitter still can be keyed with the local mic. Normal condition is OFF position.
- The speaker switch enables the local de-emped speaker audio. When on a green flashing indicator displays this abnormal condition to remind you before leaving the remote site. This avoids annoying your "neighbors" with audio in the equipment room that others don't wish to be distracted with while working at the site. When in the off position a resistive load is across the (balanced) speaker output to keep the level same to outside connections. These connections appear on TB-1 19 and 20, and the

(blue) pin jacks on the local speaker. While the former can be used to drive outside equipment, the latter is handy for SINAD checking the sensitivity. Normal condition is OFF position.

- The monitor push button is handy to produce an open squelch without having to disturb the (knob) squelch setting. The yellow indicator below displays cor activity. Normal condition is RELEASED position.

### Other controls

The AGC meter is handy for measuring path RSL, receiver tuning or site evaluation, such as noise on frequency. Its calibration document ion is described under the cor board version 7.2 on this site. The local 4-pin mic jack is handy for maintenance and communication. Pin 3 provides voltage to run an accessory such as a DTMF encoder in a mic. It has a 100 ohm limiting resistors as protection against a momentary short. The far right (black) pin jack is very handy to plug in your DVM's ground lead. The production serial number is located in this area as well.



### TB-1 functions

| Term | Function              | Remarks                 |
|------|-----------------------|-------------------------|
| 1    | Main power            | 13 v nominal (12-14)    |
| 2    | Ground                | .                       |
| 3    | P.A. power            | 10v however can use 12v |
| 4    | P.A. Ground           | Heavier wire            |
| 5    | Main power            | 13 v nominal (12-14)    |
| 6    | Ground                | .                       |
| 7    | Main power            | 13 v nominal (12-14)    |
| 8    | Tx PTT input          | Active low/ground       |
| 9    | Ground                | .                       |
| 10   | Rx AF out FLAT        | from cor board          |
| 11   | Rx PTT 1 out          | 13 v nominal (12-14)    |
| 12   | Rx PTT 2 out          | Only for corbd ver 5.3  |
| 13   | H.U.B. Closed loop    |                         |
| 14   | Squelch wiper/monitor | protected with 100 ohms |
| 15   | Detected audio        | Has DC component        |

|    |                |                         |
|----|----------------|-------------------------|
| 16 | Ground         | .                       |
| 17 | F1 line select | Ground to enable Tx, Rx |
| 18 | F2 line select | Ground to enable Tx, Rx |
| 19 | Local audio    | Balanced                |
| 20 | Local audio    | Balanced                |

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