

4. Adjustment Procedure

Measurement Condition

The following sections describe the alignment procedure for AT-100B LMR transceiver under the following reference environment conditions:

Temperature	:	25 \pm 1 C (77 \pm 1 F)
Relative Humidity	:	65%
Power Supply Voltage	:	7.5VDC \pm 5%

Test Equipment / Tools required

The following list of equipment is recommended for use in setting up the radio properly. Please ensure the test equipment are calibrated according to the manufacturer's instructions:

- Frequency counter more than 300MHz \pm 100Hz tolerance, high input impedance and high sensitivity
- VHF FM Signal generator, 300MHz with adjustable frequency, FM deviation, and RF output attenuators. 50 Ω Output impedance.
- Oscilloscope, high input impedance.
- 16 Ω 1 Watt resistor as loudspeaker load
- Audio Signal Generator, 10Hz to 20KHz, 600 Ω impedance with attenuators.
- RF Watt meter, with 50 Ω 5 Watt termination resistor (Or RF Voltmeter with 50 Ω termination and external 50 Ω attenuators)
- Regulated Power Supply 7.5VDC 3A output
- Digital A-V-O Multi-meter
- SINAD Meter
- External Speaker Mic plug (or special audio test jig)
- Interconnection test cable for RF and Control PCB
- Circuit Diagram for AT-100B
- PCB layout diagram for AT-100B
- Tuning tools for RF/IF transformer and the VR potentiometers

Disassembling the unit

The antenna

Disconnect the antenna

The Cover

- Remove the battery.
- Remove the 2 screws.
- The case could then be opened for servicing.
- Be careful NOT to disconnect the flexible connector between RF board and Control board.

The PCBs

- The radio consists of two PCBs, the RF (rear side) and control board (front side).
- On the RF Board, connect ANT1 to a signal generator or RF power meter.
- On the RF Board, connect Power Supply to the battery terminal contacts.
- Connect External Speaker Mic Plug (or Audio Test Jig) to J601.

Transmitter Circuit Adjustment

- Crystal frequency

On receiving mode, check Crystal output is at 12.8MHz

- Transmitter Frequency

Connect RF Power meter to ANT1, Activate PTT to transmit on 150MHz. check transmitting frequency error is within +/- 300Hz.

- Transmitter Output Power

Activate PTT to transmit on 150MHz, Set VR501 for 5W power output at ANT1. And Set VR502 for 2W power output at ANT1 after changing Low power output mode.

- Transmitter Sub-Audible Tone Deviation

Set radio to transmit on 150MHz, with CTCSS code 38 (250.3Hz) and no audio modulation. Adjust VR302 for 0.6KHz deviation.

- Transmitter Deviation Limit

Set radio to transmit on 150MHz, with CTCSS code 38 (250.3Hz) and no audio modulation. At the external microphone input, inject 1KHz tone at -20dBm. Adjust VR303 for 4KHz deviation. Reduce 1KHz tone input to -40dBm, check deviation dropped to 2.4 to 4KHz.

Receiver Circuit Adjustment

- FM Demodulator Adjustment

Set radio to receive on 150MHz, No CTCSS or DCS. Connect RF Signal Generator to ANT1, Set generator to 150MHz at -60dBm (50Ω) output with 1KHz tone modulation at 3KHz deviation.

- Receiver Sensitivity

After adjusting the FM demodulator, reduce the output level of RF Signal Generator. Check the receiver sensitivity at 12dB SINAD to be around -119dBm. Adjust T101~104 if necessary to bring up the sensitivity.

- Receiver Squelch Adjustment

After checking the receiver sensitivity, further lower the RF Signal Generator output to 8-10dB SINAD and observe the squelch circuit operates. Adjust VR101 if necessary.

5. Operational Test

Conduct operational test on all the major features and transmit/receive on all the channels. Observe all LCD/LED displays and alert tones are operative and all the buttons are functional. Refer to user manual for details.

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