

TRANSCEIVER ADJUSTMENTS

EXHIBIT	DESCRIPTION
8A	Frequency adjustments
8B	Transmit output power
8C	Maximum TX audio deviation
8D	Receive audio adjustment

FREQUENCY ADJUSTMENTS

In analog and digital mode, on power up, the radio starts with a reference frequency value that is phased per the following procedure:

1. Connect the radio to test equipment capable of communicating with it over the 'Motorola Proprietary' three-wire bus.
2. Enter the proper test commands to transmit on channel 383.
3. Monitor the transmitter output with a frequency counter (accurate to 0.1 PPM).
4. Select a new customer frequency warp value (between 0 to 255).
5. Program the new frequency warp value using the correct test command.
6. Repeat steps 3, 4 and 5 until frequency is within specification.

TRANSMIT OUTPUT POWER ADJUSTMENTS

ANALOG MODE

1. Connect the radio to test equipment.
2. Enter the proper test commands to transmit on channel 383.
3. Monitor the transmitter output.
4. Using handset test commands, adjust the output levels as shown in the table below.

<u>Power Step</u>	<u>Nominal Output Power (at Antenna Port)</u>
2	27.0 dBm +/- 1 dB
3	24.0 dBm +/- 1 dB
4	20.0 dBm +/- 1 dB
5	16.0 dBm +/- 1 dB
6	12.0 dBm +/- 1 dB
7	8.0 dBm +/- 1 dB

DIGITAL MODE

In digital mode, the transmitter is operated in CDMA mode. As specified in TIA/EIA IS-95-A, the transmission duty cycle varies with the transmission data rate. At data rates of 14400, 7200, 3600, and 1800 bits/second, the average transmission duty cycle is 100, 50, 25, and 12.5 percent respectively.

1. Connect the radio to test equipment.
2. Enter the proper test commands to transmit at 100% duty cycle on channel 384.
3. Monitor the transmitter output.
1. Using handset test commands, adjust the output levels as listed below:

Transmitter output maximum nominal power = +24 dBm +/- 0.5 dB @ -104 dBm receive input power

Transmitter output Power = - receive input power -73 +/- 3 dB

Receive input power = -104 dBm to -25 dBm

MAXIMUM TX AUDIO DEVIATION

ANALOG MODE

1. Connect the radio to test equipment.
2. Enter the proper test commands to transmit on channel 383.
3. Using handset test commands, enable the compander, unmute the transmit audio and select the handsfree audio path.
4. Inject an unbalanced 1 kHz, 6V RMS audio signal on pin 8 of the external connector.
5. Using handset test commands adjust for a peak deviation of 11.25 ± 0.1 kHz.

DIGITAL MODE

In the digital mode, audio from the microphone is first digitized, then coded and converted to OQPSK data in the form of I and Q signals which are sent to the modulator. Thus, for digital mode, maximum TX audio deviation is not relevant because a large or small MIC audio signal would only result in different data pattern.

RECEIVE AUDIO LEVEL ADJUSTMENT

ANALOG MODE

1. Connect the radio to test equipment.
2. Set RF signal generator to -50 dBm. Modulate using a 1 kHz tone for a deviation of 2.9 kHz.
3. Using handset test commands, enable the compander, unmute the receive audio gates, select volume step 4 and select the handsfree audio path.
4. Measure the audio output at pin 9 of the external connector.
2. Using handset test commands adjust for 100 mV RMS \pm 14 mV.

DIGITAL MODE

In the digital mode, receive audio is first available as QPSK data in the form of I and Q signals. These signals are demodulated, decoded, and presented to the vocoder DSP. The vocoder recovers the 8 bit Mu-255 law companded values of the audio samples and inputs them to the codec. The codec converts the audio data to an analog signal using a 16 bit non-linear D/A converter and a 3.4 kHz low-pass filter. Due to the fact that audio samples are coded (and not sampled), no receive audio level adjustment is available in digital mode.