

Preparation

70-101BD & 201BD

PROGRAMMING

The 70-101BD & 70-201BD series radio requires the 70-1410K Programming Kit, including programming software interface module, and programmer interface cable.

ALIGNMENT PROCEDURE

THE 70-x01BD UHF/VHF Receiver is by design, broad band covering UHF (440-470MHz) and VHF (148-174MHz) and should require no special alignment, unless repairs are performed on the receiver portion.

Should repairs be necessary, use the "Test Equipment Diagram" and the "Alignment Points Diagram", in conjunction with the following procedures:

An Extender Board (P/N: 70-075845) is required in order to separate the Digital and RF PCBs to allow access to the alignment points. Installation instructions are provided with the Extender Board Assembly.

RECEIVER

1. Apply a standard test signal to the receiver antenna terminals.
2. Adjust **T1** for maximum sensitivity and audio output with minimum audio distortion.
3. Adjust **RV403** for the specific audio output level.

RX VCO

1. Set the unit to the highest receive frequency, 470MHz (UHF) or 174MHz (VHF) and adjust the VCO **L303** 8 volts.
2. Set the unit to the lowest receive frequency, 440MHz (UHF), 148 (VHF) and check that the VCO voltage is above 2.0 volts. If voltage is below 2.0 volts, adjust **L303** for 2.0 volts or more.

Note: Use **TP1** to measure the voltage.

TRANSMITTER

Connect the unit to a Service Monitor with the power meter setting to the 10W scale (or autorange).

TCXO

Set the channel selector to the mid-range frequency 460MHz, adjust **TCX01** for a reading of 460MHz – 200Hz (155MHz VHF models).

TX VCO

1. Set the unit to the highest transmit frequency, 470MHz (UHF), 174MHz (VHF) key the transmitter and adjust the VCO **L203** to 8 volts.
2. Set the unit to the lowest transmit frequency 440MHz (UHF), 148MHz (VHF) key the transmitter and check that the Vco voltage is above 2.0 volts. If voltage is below 2.0 volts, adjust **L203** for 2.0 volts or more.

Note: Use **TP1** to measure the voltage.

TX Deviation and Balance Adjustment

1. Set the unit to a mid frequency and input the TX data with 400Hz standard audio level.
2. Increase the signal level to 20dB from standard level.
3. Monitor the demodulated signal from service monitor. Adjust **RV3** to make the monitored signal to be a balanced square wave.

4. Reduce input signal to the standard level and adjust **RV2** for the standard deviation.

APC

1. Adjust **RV1** for High Power (5W).
2. Adjust **RV6** for Low Power (1W).
3. This completes the transmitter alignment procedures.

70-x01BD Squelch setting using 70-1410K Programming Kit

The squelch level setting to open or close (mute or unmute) on the 70-101BD and 70-201BD is performed by software control.

The RSSI utilizes the A/D conversion that will be fed to the microprocessor, which in turn will use this input to determine the squelch level setting to control the mute and unmute of the receiver.

Default setting of squelch level for all the 70-x01BD from our manufacture and workshop is approximately set at:

1. Squelch open (unmute) at -114dBm to -113dBm ($0.45 - 0.5\text{mV}$ of the RX signal strength).
2. Squelch close (mute) at -117dBm to -116dBm ($0.3 - 0.35\text{mV}$ of the RX signal strength).

Changing the default squelch settings requires use of the programming adaptor box. This box is designed for use, not only as part of the programming kit, but also as a tool of squelch level setting.

The minimum equipment required for squelch level setting is a RF signal generator. Radio communication test equipment is recommended.

1. Power up the programming adaptor box (use the DC supply of 9-15 Volts 200mA).
2. Hook up the 70-x01BD unit to the programming adaptor box, and its antenna connector to the RF input port of the RF signal generator.
3. With the adaptor box turned "off", simultaneously press and hold both "ON/OFF" and "WRITE" buttons down.
4. Release the "ON/OFF" button first then the "WRITE" button next. LED indicator on the box will flash twice, after that it may stay on / off, this is of no concern. Depending on the signal strength of the RF generator, as well as the pre-set level of squelch, the 70-x01BD may be in standby mode (LED OFF) or in receiving mode (LED ON).
5. Adjust the RF signal generator for the desired signal strength to OPEN squelch (e.g. default setting is -113dBm , that is equivalent to 0.5mV).
6. Press and release "READ" button, LED indicator will flash 3 times then it will be ON.
7. Adjust the RF signal generator for the desired signal strength to CLOSE squelch (e.g. default setting is -116dBm , that is equivalent to 0.35mV).
8. Press and release "READ" button, LED indicator will flash 1 time then it will be OFF.
9. Press and release "WRITE" button, LED indicator will flash twice.
10. Squelch level is now set. Test for desired level by increasing or decreasing the RF signal to levels set for open and close squelch (mute LED will be OFF & unmute LED will be ON).

Note: The difference of RF signal strength between the unmute and mute levels must be greater than or at least equal to 0.15mV (i.e. at least -123.5dBm) for the squelch setting to work properly. If they are too close to one another, RSSI through the A/D conversion can not differentiate between the mute and unmute level properly. As a result, it would cause the CD (Carrier Detect) to act intermittently.