

70-0511 Alignment Procedure

SETUP

- 1 Remove the six securing screws from the bottom cover , and the cover itself.
- 2 Connect a resistive 50 Ω RF load and wattmeter to Antenna Connector J501.
- 3 Connect 13.6V DC power to transceiver J202.
- 4 Connect a 3.2 Ω , 20W resistor to pins 4 and 6 of the Accessory Plug. The jumper between pins 5 and 6 must be temporarily removed to make this connection.
The resistor serves as a constant load to replace the speaker's inconsistencies.

CAUTION: Both speaker terminals are LIVE. Never ground either one. Connect grounded receive-audio measuring-equipment to only one side of the speaker, and chassis ground. Normally, voltage measurement will be half of true values.

- 5 Turn the radio on (Push on and Push off switch), set the VOLUME control to a mid-position.

Connect the Programmer to Programming Port Mic Jack J302.

Upload the radio programming Data-Packet into the Programmer and initiate its Remote Control Mode. Refer to the appropriate manual for details.

SYNTHESIZER ALIGNMENT

•VCO Resonance

- 1 Select the Remote Control Mode of the Programmer and enter the following test frequencies:

	A-Band	B-Band	C-Band
RX Frequency	30.00	36.00	42.00 MHz
TX Frequency	30.00	36.00	42.00 MHz

- 2 Adjust Channel RX Tank L713 for 1.5V DC at VC (VCO Steering) .
- 3 Active transmit mode (using the programmer) and adjust TX Tank L702 for 1.5V DC at VC (VCO Steering) .

- Reference Oscillator

- 4 Initiate transmit on any channel. Measure transmitted RF carrier frequency without modulation and, if necessary, adjust REFERENCE OSCILLATOR X701 for carrier frequency to within $\pm 30\text{Hz}$ of channel frequency.

PA MODULE ALIGNMENT

The 70-0511 should be adjusted to have a 6 MHz channel spread (8 MHz C-Band) at 60W. To do so :

- 1 Change the TX test frequency to the desired frequency.
- 2 Activate transmit mode and measure RF power at Antenna connector J501.
Set RF output power to 60W at J501 using the programmer.

MODULATOR ALIGNMENT

- Modulation Limiting

- 1 Disconnect the hand microphone from its front panel Mic Jack J302.
Apply 3Vrms of 1000Hz signal to pin 1 of Mic Jack J302, then initiate transmit.
- 2 Measure total carrier deviation and, if needed adjust modulation limiting to obtain $\pm 5\text{KHz}$ (wide) or $\pm 2.5\text{KHz}$ (narrow) using the programmer.

- Microphone Gain

- 3 No alignment for Microphone gain is required.

- CTCSS/DCS

- 4 Remove the 1KHz audio signal from Mic Jack J302.
- 5 Add 250.3Hz CTCSS tone to the transmit test by testing frequency using the programmer.
- 6 Adjust CTCSS deviation to $\pm 750\text{ Hz} \pm 10\text{ Hz}$ (wide) or $\pm 375\text{ Hz} \pm 10\text{ Hz}$ (narrow) deviation using the programmer.
- 7 Change 67.0 Hz CTCSS tone to the transmit test by testing frequency using in the programmer.

- 8 Adjust RV401 for $\pm 750 \text{ Hz} \pm 100 \text{ Hz}$ (wide) or $\pm 375 \text{ Hz} \pm 100 \text{ Hz}$ (narrow) deviation.
- 9 Change the transmit DCS code +023 to the transmit test by testing frequency using the programmer.
- 10 Adjust RV401 so that modulation waveform from modulation analyzer matches the correct waveform shown in Figure 2-1.
- 11 Change 250.3 Hz CTCSS tone to the transmit test by testing frequency using the programmer. Carefully adjust RV401 for $\pm 750 \text{ Hz} \pm 10 \text{ Hz}$ (wide) or $\pm 375 \text{ Hz} \pm 10 \text{ Hz}$ (narrow) deviation.

- DTMF

- 12 Clear the CTCSS tone, then initiate transmit test by testing frequency using the programmer.
- 13 Adjust DTMF deviation to $\pm 2.0 \text{ KHz} \pm 10 \text{ Hz}$ (wide) or $\pm 1 \text{ KHz} \pm 10 \text{ Hz}$ (narrow) deviation using the programmer.