APPENDIX 6

TRANSMITTER ALIGNMENT

TWO (2) PAGE ALIGNMENT INSTRUCTIONS FOLLOW THIS SHEET

ALIGNMENT/ADJUSTMENTS; 75—440

A. GENERAL

For proper alignment, the unit should be programmed with the following channel and frequency information.

CHANNEL NUMBER	RECEIVE FREQUENCY(RX) (MHz)	TRANSMIT FREQUENCY(TX) (MHz)	RX/TX TONE CODE	CHANNEL SPACING
CH 1	469.950	469.990	NO TONE	25KHz
CH 2	450.050	450.025	NO TONE	25KHz
CH 3	455.050	455.050	100Hz TONE	25KHz
CH 4	455.050	455.050	627 DCS CODE	25KHz
CH 5	450.050	450.025	NO TONE	12.5KHz

Make connections to the Unit per Figure 1 (Equipment Test Set-up) below and Figure 2 (Test Adapter). For the location of the components called out in these procedures, refer to RF Board and SUB Board.

B. SYNTHESIZER/TRANSMITTER

VCO Check

NOTE: VCO check must be accomplished before proceeding with the Transmitter and/or Receiver Alignment.

1. Connect the voltmeter to TP1.
2. Place the Unit on channel 1 (469.950MHz, RX; 469.990MHz, TX).
3. Tune CV901 in Receive mode for 4.80V ± 0.05V at TP1.
4. Push the PTT switch (TX) and tune CV902 for 4.80V ± 0.05V at TP1.

Frequency Adjustment

1. Connect the Radio in accordance with Figure 1.
2. Place the Unit on channel 1 (469.950MHz, RX; 469.990MHz, TX).
3. Operate the transmitter and adjust RV402 for a Frequency Counter reading within ± 100Hz of the programmed transmit frequency.

Transmitter Alignment

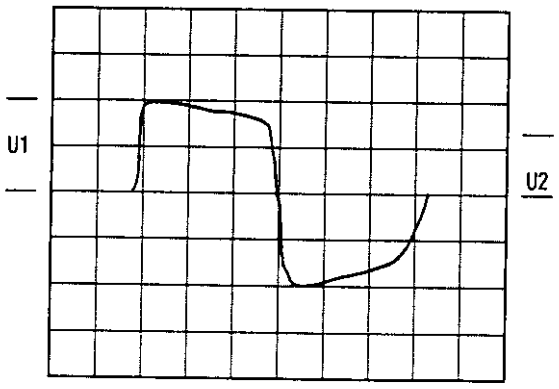
NOTE: In order to obtain proper transmission output power, connect the Radio to the power supply with a cable that is rated to withstand a current of 2 amperes or greater.

POWER ADJUSTMENT

1. Connect the Radio in accordance with Figure 1.
2. Place the Radio on the channel 2 (450.050MHz, RX; 450.025MHz, TX).
3. Place the Unit in HIGH POWER mode.
4. Turn RV555 and RV561 fully clockwise.
5. Operate the transmitter, using TA-S1, to make sure that the maximum RF output power reading on the wattmeter is 2.2 W or greater.
6. Adjust RV555 (HI PWR ADJ) for a reading of 2.0 W ±0.1 W. Check to make sure that the transmit current is within 800 - 1000 mA after the adjustment has been made.
7. Place the Unit in the LOW POWER mode.
8. Adjust RV561 (LO PWR ADJ) for a reading of 1.0 W ±0.1 W. Check to make sure that the transmit current is within 500 - 700 mA after the adjustment has been made.

MODULATION ADJUSTMENT

1. Connect the Radio in accordance with Figure 1.
2. Place the Radio on channel 2 (450.050MHz, RX; 450.025MHz, TX).
3. Apply a 1kHz tone signal to Test Adapter's AF Input (Figure 2), which is the microphone impedance matching network.
4. Plug the Test Adapter into the external speaker/microphone jack.
5. Set the audio generator's output level at approximate 300mVrms at TPA of the Test adapter.
6. Operate the transmitter, using TA-S1, and adjust RV201(MOD.ADJ) for ±4.0kHz deviation.
7. To adjust CTCSS and DCS Deviation, perform step1 though 6 above. Then set the FM liner detector audio bandwidth of ≦0.25Hz to≧15,000Hz. Turn the de-emphasis function off.
8. Place the Radio on channel 4 (455.050MHz, TX; 627 DCS CODE).
   Set the audio generator output to 0V operate the transmitter, using TA-S1 and adjust the DCS balance control RV203 to U1-U2 is minimum on the Oscilloscope.
9. Place the Radio on channel 3 (455.050MHz, TX; 100Hz Tone).
   Operate the transmitter using TA-S1, and adjust RV202 to ±800Hz deviation on Modulation Analyzer.



APPENDIX 7

CIRCUITS AND DEVICES TO STABILIZE FREQUENCY

A PLL circuit using a 14.4 MHz TCXO generates and stabilizes the output frequency.

APPENDIX 8

CIRCUITS TO SUPPRESS SPURIOUS RADIATION AND LIMIT MODULATION

CIRCUITS TO SUPPRESS SPURIOUS RADIATION AND HARMONICS

After the PTT is pressed, the +5VTX line switches to approximately 5V. Q919 is turned on enabling transmit VCO. The VCO buffer, pre-driver, driver and power amplifier are biased on by Q430, which is biased on by the +5VTX line switching to 5V. RF output from the transmit VCO (Q916) is applied to the VCO output buffer Q915. Output from Q915 feeds the buffer Q413. The output signal from Q413 feeds the pre-driver amplifier Q412, and feeds the driver amplifier Q500, whose output from the driver stage feeds the final RF power amplifier Q501 to produce the rated output power of 2 watts.

The output of the final is applied to a low-pass filter (C451, C452 and L413) and then to the transmit/receive switch Q402. RF power is then fed to the antenna via the output low-pass filter consisting of C401, C405, C408, L401 and L402.

Transmit speech audio is provided by either the internal electric microphone N101 or the external microphone. The microphone audio is applied to MIC MUTE SW Q235, and low-pass filter Q214A, Q214B. The audio is pre-emphasized by 6 dB per octave by C236 and R284, and then signal amplification. The gain is such that when a signal 20 dB greater than limiting the peak-to-peak output. Under these conditions, the MOD.ADJ.Pot RV201 configured as a four-pole active low-pass filter. The resulting signal is then limited when respect to side band splatter, and has an 18 dB per octave roll-off above 3 KHz.

The audio is then applied through the 25 KHz/12.5 KHz channel spacing SW Q215 to transmit VCO. By varying the voltage on the varactor diode Q921 at an audio rate. The resonant frequency of VCO is varied. The result is an oscillator output that is frequency modulated at the audio frequency.