

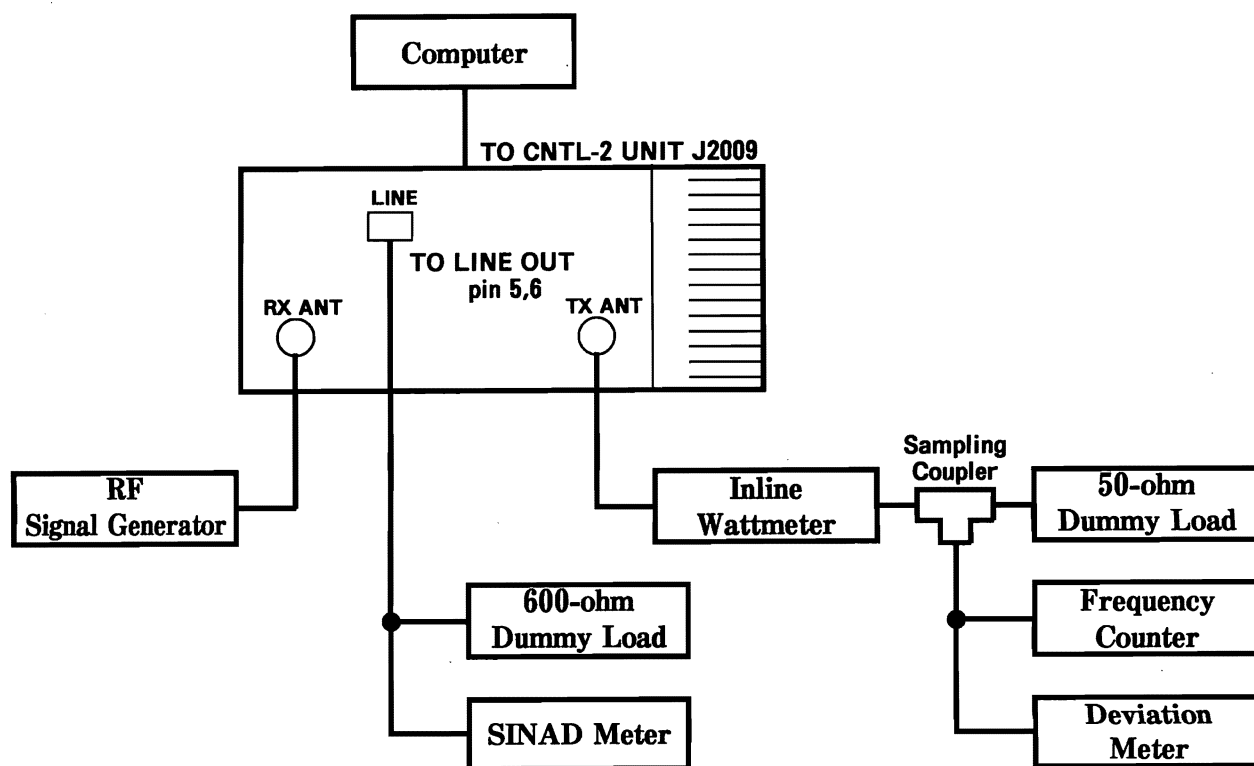
## Alignment

The VXR-5000 has been factory aligned for the specified performance across the entire operating frequency range. Realignment should not be necessary except in the event of a component failure. All component replacement and service should only be performed by an authorized Yaesu service representative, or the warranty policy may be voided.

### Required test equipment

- IBM PC/compatible computer
- Yaesu CE-8 Channel Programming Diskette and VPL-1 connection cable.
- RF Signal Generator with calibrated output level at 200 MHz.
- Deviation Meter (linear detector)
- Oscilloscope
- AF millivoltmeter
- SINAD Meter
- In-line Wattmeter with 5% accuracy at 200 MHz.
- Regulated DC Power Supply adjustable from 10 -17 VDC, 15 A.
- 50-Ohm, non-reactive Dummy Load: 100 W @ 200 MHz.
- Frequency Counter  $\pm 0.2$  ppm accuracy at 200 MHz
- AF Signal Generator
- DC Voltmeter: high input impedance
- Spectrum Analyzer
- VHF Sampling Coupler

Before alignment, connect the repeater and PC to the VPL-1 connection cable as described in the Channel Programming Chapter, and download the EEPROM data from the transceiver to the computer. Then store this data in a file so that it can be uploaded when alignment is finished.



Alignment Setup

**Note!**

To start the CE-8 software in the *Alignment Mode*, use the `-a` command line switch. eg. `C:>ce8 -a (enter)`

Next, using the CE-8 Channel Editor and referring to the table below, program channels 1, 2 and 3 according to version type. Set these three channels to simplex and, and turn off any tone settings for these channels. Upload this data to the repeater.

VER.	Low Ch.	Center Ch.	High Ch.	Frequency Range
A	140.1	141.1	142.1	134 - 146 MHz
B	152.1	153.1	154.1	146 - 160 MHz
BS-1	161.1	162.1	163.1	156 - 168 MHz
C	168.1	169.1	170.1	164 - 174 MHz

note: above channels are the band-center for each version type  
maximum receiver spread w/o degradation is 2 MHz

*Note: When finished with alignment, make certain to reload the original channel data from disk, and upload it back to the repeater.*

Before beginning alignment, preset the following controls and switches as follows.

- VR2002-VR2005 & VR2006: center, 12 o'clock position

- L4002, L4003, L4005, L4011, L4013, L4015  
T4001, T4002: flush with the top of coil form
- VR7071: centered
- VR4001: fully clockwise
- S2003: NOR
- S2005: INT
- S2001 & S2004: LOW
- S2006: NOR
- pin 10 of ACC connector to GND

**Power Supply Voltage Alignment**

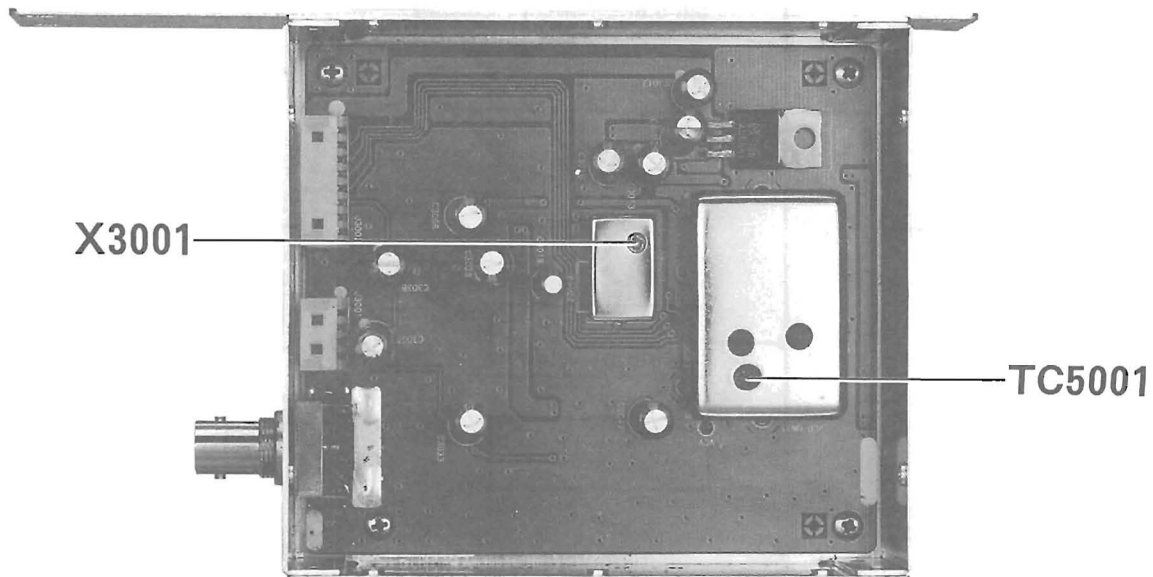
- Connect the positive (+) lead of the DC voltmeter to P7001 on the REG Unit, and negative (-) to P7002, then adjust VR7001 for  $13.8 \pm 0.1$  VDC.

**Transmitter**

- Set up the test equipment as shown below for TX alignment. Adjust the supply voltage to 13.8 VDC (as above) for all steps.

**VCV Adjustment**

- Select the high band-edge channel, connect the DC voltmeter between VCV land and GND on the TX Unit. Then key the repeater and adjust TC5001 on the TX VCO Unit for 7.5 VDC.
- Connect a frequency counter to the **TX ANT** jack via a sampling coupler (attenu-



TX Alignment Points

ator pad), key the transmitter and adjust X3001, so that the TX frequency is within  $\pm 150$  Hz of the programmed TX frequency.

### RX Unit

Set up the test equipment as shown here for receiver alignment.

#### VCV Adjustment

- Select the highest receive frequency, then connect a DC voltmeter between the VCV land and GND on the RX Unit. Adjust TC5501 on the RX VCO Unit for 7.5 VDC.

#### Sensitivity Adjust

- Inject a 0 dBu signal modulated with 1 kHz tone at 20 mV RMS and 5 kHz deviation to the RX ANT connector.
- Adjust L4002, L4003, L4005, L4011, L4013 and L4015 for maximum SINAD indication. Confirm that the 12 SINAD level does not exceed  $.35 \mu\text{V}$  on the low, mid and high receive frequencies.
- Increase SG output to +40 dBu, then adjust T4001 and T4002 for minimum distortion level indicated on the SINAD meter.

### TX Output Power

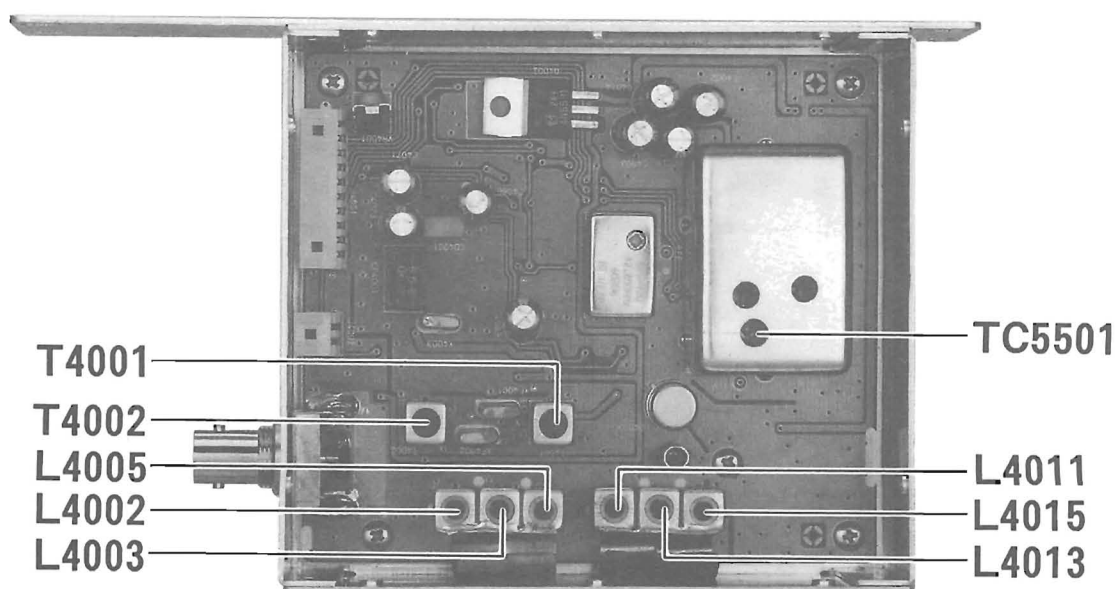
- Connect a dummy load wattmeter to the **TX ANT** connector.

#### Full Power Set

- Connect the VPL-1 connection cable to J2008 on CNTL Unit 2, then load the CE-8 programming software. Recall the alignment adjustment file, and press the return key. Key the repeater and press the function key indicated in the program for an indication of 25 watts ( $\pm 0.5$  watt) on the wattmeter.

#### Low Power Set

- Repeat the above procedure for an indication of 12.5 Watts ( $\pm 0.5$  watts) on the wattmeter.
- Press the F10 key to exit the adjustment mode, then press F4 to save the settings to memory. Disconnect the VPL-1 cable.



RX Unit Alignment Points

## **Repeater Mode**

### *Squelch Adjust*

- First ensure the DUPLEX mode of operation is enabled via CE-8 programming.
- Inject a standard deviation 0 dB $\mu$  signal into the **RX ANT** jack. Adjust VR4001 on the RX Unit to the point where the TX is activated.

### *Deviation Adjustment*

- Inject a 1-kHz, 40 dBu 3-kHz signal to the **RX ANT** jack, and adjust VR2005 for 3.0 kHz ( $\pm 0.1$  kHz) TX deviation.

## **Base Mode**

Note: When making Base Mode adjustments, connect pin 13 of the **ACC** jack to GND.

### *Audio Level Adjust*

- Connect the SG to the **RX ANT** jack and adjust the SG output level to 40 dBu and standard deviation level. Adjust VR2005 for -10 dBm  $\pm 0.1$  dBm line out audio level.

### *Deviation Adjustment*

- Connect an audio signal generator to line-in jack, then adjust generator output level to 10 dBm @ 1 kHz. Adjust VR2002 for 3.0 kHz  $\pm 0.1$  kHz deviation.