

## CRYSTAL INSTALLATION

### ■ Sources without Ovens

1. Remove the side plate bearing the Frequency West logo from the unit (held by four screws).
2. Clip the replacement crystal leads to between 0.150 and 0.190 inch in length. Insert the crystal in its socket. See Figure 2. For best results use crystals meeting Frequency West Specifications 37-051990 and 37-051991.
3. Replace the side plate.
4. Proceed to *Alignment – All Phase Locked Sources and Oscillators*.

### ■ Sources with Ovens

1. Remove the side plate bearing the Frequency West logo from the unit, the oven insulator, crystal heat sink, and the crystal. See Figure 3.
2. Clip the replacement crystal leads to between 0.150 and 0.190 inch in length. Insert the crystal into its socket. For best results use crystals meeting Frequency West Specification 37-052243.
3. Replace the crystal heat sink, insuring that the heat sink slot clears the oven thermistor wire. Replace the oven insulator and side plate.
4. Proceed to *Alignment – All Phase Locked Sources and Oscillators*.

## ALIGNMENT PROCEDURES

### ■ Preliminary Setup – Sources Using External Reference Oscillator

1. Turn the fundamental oscillator tuning screw counterclockwise until the source is tuned to the lowest frequency of the operating band while monitoring the source frequency with a frequency meter or counter.
2. Divide the desired output frequency by the net multiplier ratio (see Table 1 or 2) to obtain the required reference input frequency from the external crystal oscillator or frequency synthesizer.
3. Connect the external oscillator to the source reference oscillator input jack. (Input power requirement is 0 to +10 dBm; 50 ohms nominal impedance.)
4. Proceed to *Alignment – All Phase Locked Sources and Oscillators*.

### ■ Alignment – All Phase Locked Sources and Oscillators

1. Apply the specified input (supply) voltage between the DC input terminal and ground. The required input voltage is indicated above the terminal.

#### NOTE

*Sources with odd model numbers require positive power supply input voltages; those with even model numbers require negative input voltages. The procedure below applies to both types of units; however, the polarity of the voltages listed in the various steps must be reversed for those sources with positive voltage power supplies.*

2. Connect a VOM to the crystal oscillator test point (XTAL). Set the VOM on the +1.5 VDC scale. The typical voltage level at this point will be 0.2 volts.

#### NOTE

*Step 3 does not apply to units using external reference oscillators.*

3. Tune the crystal oscillator coil, or capacitor (through a hole in the side plate or the front plate, depending on the configuration) until a reading is obtained (approximately 0.2V). Maximize this reading.

A maximized VOM reading at this point can be expected to yield a crystal oscillator accuracy within approximately 5 ppm of the marked crystal frequency.

If a frequency counter is available, connect the counter to the crystal oscillator monitor connector and tune the crystal oscillator to the exact frequency. Make sure that the crystal oscillator is not near dropout by rocking the tuning screw back and forth. The unit should tune a minimum of 5 ppm, or 500 Hz at 100 MHz.

Reset the crystal frequency to the correct frequency.

4. Connect an oscilloscope or VOM to one of the phase voltage terminals ( $\phi$  V). The two terminals should be jumpered together on units with two terminals. For sources that have a lock limit alarm, connect the scope or VOM to the single phase voltage terminal. The scope should show a waveform of between 50 and 500 Hz, with an amplitude greater than 12V p-p. The VOM should read approximately 9 volts on the AC (rms) scale.