Alignment

The VXA-*** is carefully aligned at the factory for the specified performance across the Aircraft and Weather bands. Realignment should therefore not be necessary except in the event of a component failure.

The following procedures cover the adjustments that are not normally required once the transceiver has left the factory. However, if damage occurs and some parts subsequently are replaced, realignment may be required. If a sudden problem occurs during normal operation, it is likely due to component failure; realignment should not be done until after the faulty component has been replaced.

We recommend that servicing be performed only by authorized VERTEX STANDARD service technicians who are experienced with the circuitry and fully equipped for repair and alignment. If a fault is suspected, contact the dealer from whom the transceiver was purchased for instructions regarding repair. Under no circumstances should any alignment be attempted unless the normal function and operation of the transceiver are clearly understood, the cause of the malfunction has been clearly pinpointed and any faulty components replaced, and realignment determined to be absolutely necessary. Problems caused by unauthorized attempts at realignment are not covered by the warranty policy

VERTEX STANDARD reserves the right to change circuits and alignment procedures, in the interest of improved performance, without notifying owners.

The following test equipment (and familiarity with its use) is necessary for complete realignment. While most steps do not require all of the equipment listed, the interactions of some adjustments may require that more complex adjustments be performed afterwards. Do not attempt to perform only a signal step unless it is clearly isolated electrically from all other steps. Have all test equipment ready before beginning, and follow all of the steps in a section in the order presented.

Correction of problems caused by misalignment resulting from use of improper test equipment is not covered under the warranty policy.

Required Test Equipment

- ❑ Avionics Radio Tester with calibrated output level at 200 MHz
- ❑ In-line Wattmeter with 5% accuracy at 200 MHz
- ❑ 50-Ω, 10-W RF Dummy Load
- ❑ Regulated DC Power Supply adjustable from 3 to 15 VDC, 2A
- ❑ Frequency Counter: ±0.2 ppm accuracy at 200 MHz

- ❑ AF Signal Generator
- ❑ AC Voltmeter
- ❑ DC Voltmeter: high impedance
- ❑ VHF Sampling Coupler

Alignment Preparation & Precautions

A 50-Ω RF load and in-line wattmeter must be connected to the main antenna jack in all procedures that call for transmission, except where specified otherwise. Correct alignment is not possible with an antenna. After completing one step, read the next step to see if the same test equipment is required. If not, remove the test equipment (except dummy load and wattmeter, if connected) before proceeding.

Correct alignment requires that the ambient temperature be the same as that of the transceiver and test equipment, and that this temperature be held constant between 20~30 °C (68-86 °F). When the transceiver is brought into the shop from hot or cold air, it should be allowed some time to come to room temperature before alignment. Whenever possible, alignments should be made with oscillator shields and circuit boards firmly affixed in place. Also, the test equipment must be thoroughly warmed up before beginning.

Set up the test equipment as shown below for transceiver alignment, apply 7.2 VDC power to the transceiver. Refer to the drawings for Alignment Points.

PLL Reference Frequency

- ❑ Connect the wattmeter, dummy load and frequency counter connected to the antenna jack, and tune the transceiver to 120.000 MHz.
- ❑ Transmit, and adjust **TC1001** on the RF Unit, if necessary, so the counter frequency is 120.000 MHz (±100 Hz).

TX Power Adjustment

- ❑ Connect the wattmeter and dummy load to the antenna jack, and tune the transceiver to 128.000 MHz.
- ❑ Transmit, and adjust **VR1004** to obtain 1.5 W RF (carrier) power indicated on the wattmeter (without audio modulation input).

Tx Modulation Adjustment

- ❑ Connect the Radio Tester to the antenna jack, then adjust the AF generator output level for injection of 200 mV rms @ 1 kHz to the MIC jack. Leave the transceiver tuned to 127.500 MHz.
- ❑ Transmit, and adjust **VR1002** to obtain 85 % modulation (±5 %) as indicated on the Radio Tester.
- ❑ Reduce the AF generator output level to 20 mV rms, then adjust **VR1001** to obtain 30 % modulation (±3 %) on the Radio Tester.

VOR Phase Adjustment

- ❑ Set the transceiver to 108.000 MHz, set up the "FROM" mode (press [**F**] + [**3**] key, if necessary), and set the Avionics Radio Tester as shown below.

Frequency	108.000 MHz
Output Level	+40 dBμ
30 Hz VAR.	30 %
9.96 kHz Carrier	30 %
9.96 kHz MOD	480 Hz
DIRECT	FROM
PHASE	90°

- ❑ Adjust **VR1003** for 90° (±1°) on the transceiver display.

Internal System Alignment Routine

This feature uses a programmed routine in the transceiver which replaces many previously-complex discrete component settings and adjustments with digitally-controlled settings via the **CHANNEL** selector knob. Transceiver adjustments include:

- ❍ *Squelch Hysteresis Adjustment*
- ❍ *Squelch Threshold Adjustment*
- ❍ *Squelch "Tight" Adjustment*
- ❍ *VOR Sensitivity Adjustment*
- ❍ *VOR Sensitivity Hysteresis Adjustment*

To begin, set the transceiver to 127.500 MHz, and turn the transceiver off. Then, press and holding the **LAMP** switch, **PTT** switch and the **CHANNEL** selector knob while turning the transceiver on.

- ❍ *Squelch Hysteresis Adjustment (HSSQ)*

- ❒ Press the **CHANNEL** selector knob, then select the squelch hysteresis level using the **CHANNEL** selector knob.
- ❒ Next, press the **CHANNEL** selector knob.
- ❒ Rotate the **CHANNEL** selector knob to select the next setting.

❍ *Squelch Threshold Adjustment (THSQ)*

- ❒ Inject a –9 dBμ (0.35 μV) RF signal (with a standard modulation: 30 % AM modulation @ 1 kHz), then press the **CHANNEL** selector knob *twice*.
- ❒ Now rotate the **CHANNEL** selector knob to select the next setting.

❍ *Squelch "Tight" Adjustment (TISQ)*

- ❒ Increase the RF signal level to +15 dBμ (5.6 μV), then press the **CHANNEL** selector knob *twice*.
- ❒ Now rotate the **CHANNEL** selector knob to select the next setting.

❍ *VOR Sensitivity Adjustment (VSTR)*

- ❒ Increase the RF signal level to +10 dBμ (3.1 μV), then press the **CHANNEL** selector knob *twice*.
- ❒ Now rotate the **CHANNEL** selector knob to select the next setting.

❍ *VOR Sensitivity Hysteresis Adjustment (HSVS)*

- ❒ Press the **CHANNEL** selector knob, then select the *VOR Sensitivity* Hysteresis level using the **CHANNEL** selector knob.
- ❒ Press and hold the in the **CHANNEL** selector knob for 2 second to save all setting and exit.

Resetting the CPU

If you are unable to gain control of the transceiver (or if you want to clear all memories and settings to their factory defaults), press and holding the **MONITOR** button and **PTT** switch while turning the transceiver on.