TECHNICAL SUPPORT
Alignment Procedures

Texas Ranger TR-696F SSB Base

PLL Alignment - Transmitter Alignment - Receiver Alignment

Equipment required for Alignment procedure:

- DC Power Supply (13.8 Vdc, 20A)
- RF Wattmeter (25~60 MHz, 100W)
- Digital voltmeter or Multimeter.
- Automatic Modulation Meter.
- Audio Signal Generator
- Digital voltmeter or Multimeter.
- Frequency Counter - 100 MHz
- RF Signal Generator - 100 MHz
- Automatic Distortion Meter
- Oscilloscope (50 MHz), with X10 probe
- SINAD Meter
- 50 Ω dummy load

To view proper test equipment setup for both the receiver and transmitter portion of the alignment procedures, please see this drawing - **Test Setup**. After viewing, press "back" to return to this page.

To view Main PCB Adjustment Location of adjustment points, please see this drawing - **TR-696F SSB Main PCB**. After viewing, press "back" to return to this page.

The following steps are required to re-align the TR-696F SSB Base Station.
Caution: Alignment should only be attempted by personnel trained in RF product testing and alignment.

PLL Synthesizer Alignment:

1. VCO Voltage:
Disconnect the "short PCB" from TP7, TP8, and TP9. Set radio to CH 1 AM RX mode, set the Clarifier setting to 12 o'clock,
Adjust L14 for 2.5 Vdc ± 0.1.
Connect ocilloscope to TP2
Adjust L15 for maximum output.
Set radio to CH 1 AM RX mode, connect frequency counter to IC3 (Pin 8).
Adjust VC1 to 10.2400 MHz ± 20Hz.

2. AM Frequency:
Set radio to CH 1 AM RX mode, connect frequency counter to TP3.
Adjust L20 to 16.27000 MHz ± 20Hz.

3. USB Frequency:
Set radio to CH 1 USB RX mode, connect frequency counter to TP3.
Adjust L21 to 16.6750 MHz ± 20Hz.

4. LSB Frequency:
Set radio to CH 1 LSB RX mode, connect frequency counter to TP3.
Adjust L22 to 16.27750 MHz ± 20Hz.

5. TX Frequency:
Set radio to CH 1 AM TX mode, connect frequency counter to TP3.
Adjust VR7 to 16.27000 MHz ± 20Hz.

6. AM OSC:
Set radio CH 1 AM TX mode, connect frequency counter to TP5.
Adjust L23 to 10.69500 MHz ± 20Hz.

7. USB OSC:
Set radio CH 1 USB TX mode, short Q34 E & C, connect frequency counter to TP5.
Adjust L24 to 10.69250 MHz ± 20Hz.

8. LSB OSC:
Set radio to CH 1 LSB TX mode, connect frequency counter to TP5.
Adjust L25 to 10.69750 MHz ± 20Hz.

This completes the PLL alignment procedure.

[Return to Top of Page]

Transmitter Alignment:

1. BIAS Current:
Set radio to CH 19 USB TX mode, modulation off. Connect multimeter to TP7 (+) and TP9 (-).
Adjust VR12 for 10mA.
Connect multimeter to TP8 (+) and TP9 (-).
Adjust VR10 for 50mA.

2. SSB TX Power:
Set radio to CH 19 USB TX mode, connect the "short PCB" to TP7 and TP9, connect RF power meter to antenna jack, AF signal 30 mV, 1 KHz to microphone, set mic gain fully clockwise.
Adjust L40, L42 for maximum of 12 watts output
Adjust L43, L44 for minimum spurious emission.
Switching between CH1 and CH40, balance Power output
Adjust L40 and L42 for balance.

3. SSB ALC:
Set radio to CH 19, USB TX mode, AF signal 30 mV, 1 KHz to microphone.
Adjust VR13 for 11.5W.

4. SSB Carrier Balance:
Set radio to CH 19, USB TX mode, connect oscillope to antenna connector, mic gain off.
Adjust VR6 for minimum spurious emissions.

5. SSB APC:
Set radio to CH 19, USB mode, mod off, connect voltmeter to TP7.
Adjust VR17 for 12.5Vdc.

6. AM TX Power:
Set radio to CH 19 AM TX mode, no modulation.
Adjust VR14 for 3.8W.

7. AM Power Meter:

Set radio to CH 19 AM TX mode, no modulation.
Adjust VR9 for to a "4 " on PWR scale.

8. AM Modulation:
Set radio to CH 19 AM TX mode, AF signal 30 mV, 1 KHz to microphone.
Adjust VR16 for 90%.

9. Frequency Counter:
Set radio to CH 19 RX mode, set clarifier to 12 o'clock position, set display to ON, set dimmer control fully clockwise.
Adjust VC1 on frequency counter to read 27.1850.

This completes the Transmitter stage of the alignment procedure.

[Return to Top of Page]

Receiver Alignment:

1. AM Sensitivity:
Set radio to CH 19 AM RX mode, clarifier setting at 12 o'clock, RF gain fully clockwise, SQ at minimum, VOL control at 2 o'clock, connect RF SG to antenna jack, (Frequency 27.185 MHz, Mod 30%)
Adjust L2, 3, 5, 6, 7, 8, 9, 10 for Audio Output > 2V S/N 10db.
Set radio to CH 40 AM RX mode, RF SG setting to 27.405 MHZ.
Adjust L6 and L7 for balance between CH1 and CH40.
Set radio to CH 1 AM RX mode, RF SG setting to 28.245 MHZ.
Adjust L6 and L7 for balance between CH1 and CH40.

2. USB Sensitivity:
Set radio to CH 19 USB RX mode, set VOL control fully clockwise, RF SG setting 27.186 MHz mod 0.5µV,
Adjust L11, L12 for audio output > 2V, S/N 10db.

3. LSB Sensitivity:
Set radio to CH 19 LSB RX mode, set VOL control fully clockwise, RF SG setting 27.184 MHz mod 0.5µV.
Adjust L11, L12 for audio output > 2V, S/N 10db.

4. NB Adjust:
Set radio to CH 19 AM RX mode, RF SG setting 27.205 MHz, Mod 30%, 100 µV, NB-ANL/OFF switch to NB/ANL position, connect voltmeter to TP1.
Adjust L1 for DC Voltage to max (> 2.0V).

5. AM Squelch:
Set radio to CH 19 AM RX mode, SQ control fully clockwise, RF SG setting 1 mV, mod 30%
Adjust VR4 very slowly until squelch just opens.

6. SSB Squelch:
Set radio to CH 19 USB RX mode, SQ control fully clockwise, RF SG setting 1 mV.
Adjust VR3 very slowly until squelch just opens.

7. AM S/RF Meter:
Set radio to CH 19 AM RX mode, meter switch to S/RF position, RF SG setting 27.185 MHz , 100 µV, mod 30%.
Adjust VR1 so that meter needle goes to S9 on the S scale.

8. SSB S/RF Meter:
Set radio to CH 19 USB RX mode, meter switch to S/RF position, RF SG setting 27.186 MHz mod 100 µV.
Adjust VR2 so that meter needle goes to S9 on the S scale.

This completes the Receiver stage of the alignment procedure.

Return to Top of Page

Return to Alignment Page **Return to TR-696F SSB Page**