7 Testing, Adjusting, and Tuning

1. Connecting and measuring

   Connect the measuring and auxiliary equipment for the Tx mode BSR100 transceiver alignment procedure in accordance with the manufacture testing setup diagram.

2. Prepare the BSR100 transceiver for the first voltage power feeding, as follows:

   - Visually inspect the PS and CS sides of the BSR100 board to eliminate short circuits, breaks, and other defects.

3. Power ON the 12.5 VDC power supply, as follows:

   a) Check the current consumption of the BSR100 transceiver. It must be near 80 mA DC.

   b) Using the scope, check the variable DC level on pin 10 of the micro-controller.

   c) Power OFF the 12.5 VDC power supply.

   d) Insert the micro-controller chip in its circuit.

   e) Power ON the 12.5 VDC power supply.

   f) Check the following:
      - Current consumption of the BSR100 transceiver (it must be 140mA).
      - Self-test LEDs diagnostic.

4. The Tx mode transceiver alignment procedure:

   a) Connect the measuring and auxiliary equipment for the Tx mode BSR100 transceiver alignment procedure in accordance with manufacture testing setup diagram .Connect the additional radiator to output power transistor

   b) Power ON the 12.5V DC power supply.

   c) Check Self-test Tx mode LEDs diagnostic.

   d) Use the Gup10 utility program to write the Tx mode down output frequency of the BSR100 transceiver 164.5 MHz.

   e) Short for 10 sec. and release the self-test external PTT button.

   f) At the Tx –VCO out port, check the synthesizer out put frequency. It should be 164.500 000 MHz . Using a trimmer capacitor on the body of the TCXO225B, adjust the synthesizer output frequency.

   g) Measure the output power of the BSR100 transceiver. Maximum power reading 12W±15%.*(see the § h)

   h) Adjust trimmer capacitor C159 to receive equal output power on the low and high frequency's of a working band. Nominal power reading is 12W±15% .

   j) Check Tx mode current consumption. Current should be near 2.4A ±5% on the middle frequency of the working band and –15 %, +5% accordingly on the low and high frequency's of a working band.

   k) Check the spurious/harmonics, requirements: Power 50+10log (Pout) = 61.3 Db or 70 Db, whichever is less.

m) Take the "ON" function generator and check the 0.7V pp level output signal (meander forms)

Adjust P4 for the desired modulation, 2.0 kHz max. carrier deviation.

n) Power OFF the 12.5V DC power supply.

5. Rx mode transceiver alignment procedure.

a) Use the Gup10 utility program to write the Rx mode down input frequency of the receiver, 164.5 MHz.

b) At the LO mixer port (leg 6), check the synthesizer output frequency. It should be 209.500 000 MHz.

c) Set the RF generator output to frequency 164.5 MHz, to signal level -60 dBm with 2 kHz-frequency deviation and internal modulation of 1 kHz.

d) Check 200 mV p.p. sinusoid with a scope at TP4 (Data out).

e) Check 1000 mV p.p. sinusoid with a scope at TP8 (Audio out).

f) Set the RF generator output level to -117 dBm.

g) Check sensitivity 12 dB SINAD at TP4 (Data out).

h) Use the Gup10 utility program to write down input frequency of the receiver, 155.0 MHz .

i) Set the RF generator output to signal level -117 dBm with 2 kHz-frequency deviation and internal modulation 1 kHz.

Check sensitivity 12 dB SINAD at TP4 (Data out).

j) Use the Gup10 utility program to write down input frequency of the receiver, 174.0 MHz with 2 kHz-frequency deviation and internal modulation 1 kHz.

k) Set the RF generator output to signal level -117 dBm. Check sensitivity 12 dB SINAD at TP4 (Data out).

4.1 Adjusting channel monitor indication signal.

a) Set the RF generator output to frequency 164.5 MHz, with 2 kHz-frequency output deviation and level of external modulation.

b) Change RF generator output level from 113 dBm to 114 dBm with the help of the P2 potentiometer, adjust red/green light Ch.Mon. LED response.

5.2 Adjusting RSSI monitor signal indication.

a) Set the RF generator output to frequency 460 MHz.

b) Change RF generator output level from 102 dBm to 113 dBm.

c) Tune the P1 (SET-OFF) and P3 (GAIN) potentiometers for the 0%-100% scale response on the RSSI meter.

c) Power OFF the 12.5 VDC power supply.

6. The final prove-out

a) Collect all shielding and accessory parts of the BSR100 body

b) Collect the diagnostic panel to J5 connector.

c) Power ON the 12.5V DC power supply.

d) Check Self-test LEDs diagnostic.

e) Repeat the following activities:

- Check sensitivity 12 DB SINAD at diagnostic panel (Data out).

- Change RF generator output level from 113 dBm to 114 dBm using the P2 potentiometer adjust red/green light Ch.Mon. LED response.
- Change RF generator output level from 102 dBm to 113 dBm.
- Tune the P1 (SET-OFF) and P3 (GAIN) potentiometers for the 0%-100% scale response on the RSSI meter.
- Measure the output power of the BSR100 transceiver: Maximum power reading 12W±10%.
- Check Tx mode current consumption. Current should be near 2.4A±5% on the middle frequency of the working band.
- Check the spurious/harmonics, requirements: Power 50+10 log (Pout) = 60.79 Db or 70 Db, whichever is less.
- Adjust P4 for the desired modulation, 2.0 kHz max. deviation.

f) Power OFF the 12.5V DC power supply.