6 ADJUSTMENTS

6.1 Power Amplifier Alignment and Tuning

6.1.1 Why You Need to Tune

The 9T97A250 RF power amplifier is factory adjusted at the desired frequency. If the frequency of operation has to be changed by more than 2 MHz away from the previous frequency, then the following adjustments should be made. This is to ensure the power amplifier's optimum performance and increase the life of the RF power transistors.

6.1.2 Equipment Needed

The following tools and equipment will be required to properly align the 9T97A250 RF power amplifier.

- Directional wattmeter, 50 ohms, 5-watts full scale, 5% accuracy.
- Directional watimeter, 50 ohms, 250-watts full scale, 5% accuracy.
- 50-ohm termination 250 W.
- Tuning tool, slot, insulated.
- DC ammeter: 25 A full scale, 2.5% accuracy.
- Cables with appropriate connectors.
- Test set: M-97.

6.1.3 Exciter Check

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1. Switch ON the power supply and key the exciter. Check that the output power is 4.0 watts +/- 0.2 watts.
2. If the power output is not within this range, switch OFF the power supply and replace the exciter.

6.1.4 Power Amplifier Adjustments

1. Switch ON the power supply and key the exciter.

2. Adjust C12 on the first final for maximum power.

3. Record the current reading of this final from the M-97 test set.

4. Increase the capacitance of C12 on the first final until the power drops by 2 watts from the maximum power peak.

5. Check that the current reading has decreased on the M-97 test set.

6. Repeat steps 2 to 6 for the second final.

7. Repeat steps 2 to 6 for the third final.

8. Repeat steps 2 to 6 for the fourth final.

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9. Adjust C4 on the driver module for minimum reflected power from the power amplifier back to the exciter.

10. Adjust C2 or C3 (depending upon the band) on each final power amplifier module for maximum output power.

11. Adjust R52 (HIGH PWR ADJ) on the logic board for 250 watts of output power.

12. Repeat steps 3 to 11 until tuning does not effect the output power of the power amplifier.

13. Check that the total dc current draw for the power amplifier is less than 21 A on the dc ammeter, and the M-97 test set current reading for the final modules is less than 20.

14. Adjust R52 (HIGH PWR ADJ) for the desired output power level.

15. Switch OFF the power supply, disassemble the test equipment, and connect the exciter and power amplifier in its normal configuration.

6.2 Logic Alignment

6.2.1 Equipment

The following tools and equipment will be required to properly align the 9T97A250 RF power amplifier.

- Directional wattmeter, 50 ohms, 250 watts full scale, 5% accuracy.
- Directional wattmeter, 50 ohms, 5 watts full scale, 5% accuracy.
- 50-ohm termination 250 W.
- 10 Vdc minimum voltmeter.
- Two jumpers, 0.1 spacing (GL 270-0501).
- DC ammeter: 25 A full scale, 2.5% accuracy.
- 3 dB attenuator, 5 watt minimum.
- Test set: M-97.

6.2.2 Low and High Power Adjust

1. Remove JR26 or JR27 (which ever is installed) to inhibit power auto shutdown.

2. Switch the M-97 test set to low, power, or connect pin 12 to pin 15 of the DB15 connector, or install JR29.

3. Switch ON the power and key the exciter.

4. Adjust R53 (LOW PWR ADJ) on the logic board until the desired LOW power output is obtained.

5. If the LOW power setting is not required, turn R53 fully counter clockwise.

Note

Rotating R53 (LOW PWR ADJ) clockwise, increases output power.

6. Switch the M-97 test set to “HIGH” power, or disconnect pin 12 from pin 15 of the DB15 connector, or remove JR29 if installed. Turn R52 (HIGH PWR ADJ) on the logic board until the power amplifier’s forward output power is about 225 watts.

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7. Turn R48 (BAR GRAPH ADJ) on the logic board so that 100% LED D11 of the bar graph,just lights up.

8. Turn R52 (HIGH PWR ADJ) on the logic board until the desired HIGH power output is obtained,

9. Switch OFF the power and install a 3 dB attenuator between the exciter and the power amplifier. Switch ON the power again and key the exciter.

10. Turn R50 (RF IN LEVEL SET) on the logic board until the RF IN LED D8, just lights up.

11. Install JR28 and verify that LED D8 still turns on. Turn R50 if necessary, until D8 (RF IN LED) just turns on, then remove JR28.

12. Switch OFF the power, and remove the 3 dB attenuator installed between the exciter and the power amplifier.

13. Install either JR26 or JR27 to enable the power auto shutdown to either NO POWER or LOW POWER respectively.

14. Switch ON the power, key the exciter, and connect a 10 Vdc voltmeter to test point TP4 (P 13-1) on the logic board. Turn R51 (TEMP ALARM SET) until the voltage reads 3.0 Vdc.

15. Unkey the exciter and remove the voltmeter.

Caution

The low RF alarm trip point is set by one of jumpers JR12 to JR21. This is set to 20% with jumper JR20 at the factory. You may increase this setting in 10% steps from 100% to 10% by installing a jumper at one of the JR positions. The 100% position is jumper JR12, and the 10%position is JR21.

WARNING

DO NOT install more than one alarm trip point jumper at any time, or else the display driver will be damaged.

16. Switch OFF the power.

17. Install JR26 or JR27 (which ever was installed previously).

18. Disassemble the test equipment, and connect the exciter and power amplifier in its normal configuration.

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