

Alignment

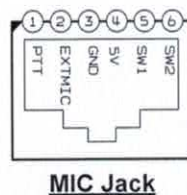
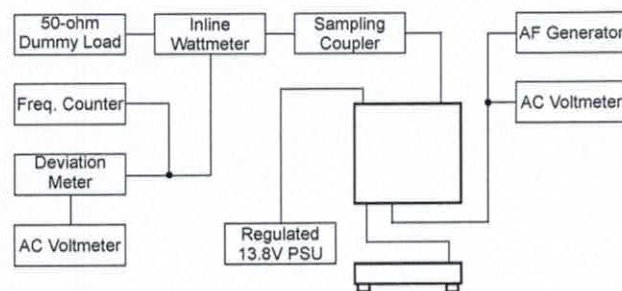
Alignment Preparation & Precautions

A 100-W RF dummy load and in-line wattmeter must be connected to the main antenna jack in all procedures that call for transmission; 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 the transceiver and test equipment be maintained at a constant ambient temperature between 68 ~ 86 °F (20 ~ 30 °C). 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.

Note: Signal levels in dB referred to in the alignment procedure are based on 0 dBμ=0.5 μV (closed circuit).

Test Setup

Set up the test equipment as shown below for transceiver alignment. Maintain the supply voltage at 13.8V DC for all steps.



Internal System Alignment Routine

This uses a programmed routine in the transceiver which simplifies many previously complex discrete component settings and adjustments with digitally-controlled settings via Microphone buttons.

To enter the Alignment mode:

1. Press and hold in the [F(MW)] and [GM] keys while turning the transceiver on.
2. Press the [POWER(LOCK)] key. "LOCK" will appear in the display.
3. Press the keys of the Microphone in the following sequence.
[0] ➡ [3] ➡ [4] ➡ [0] ➡ [3] ➡ [4]
4. Press the [POWER(LOCK)] key. "UNLOCK" will appear in the display.
5. The transceiver is now in the "Alignment mode".

Alignment

VCO VCV Adjustment

Connect the DC voltmeter to **TP1503** (MAIN) and **TP1502** (SUB). Referring to the table below, turn the transceiver to each frequency listed. Confirm that the correct voltage is present, or adjust the listed setting for the required voltage.

DC Voltmeter

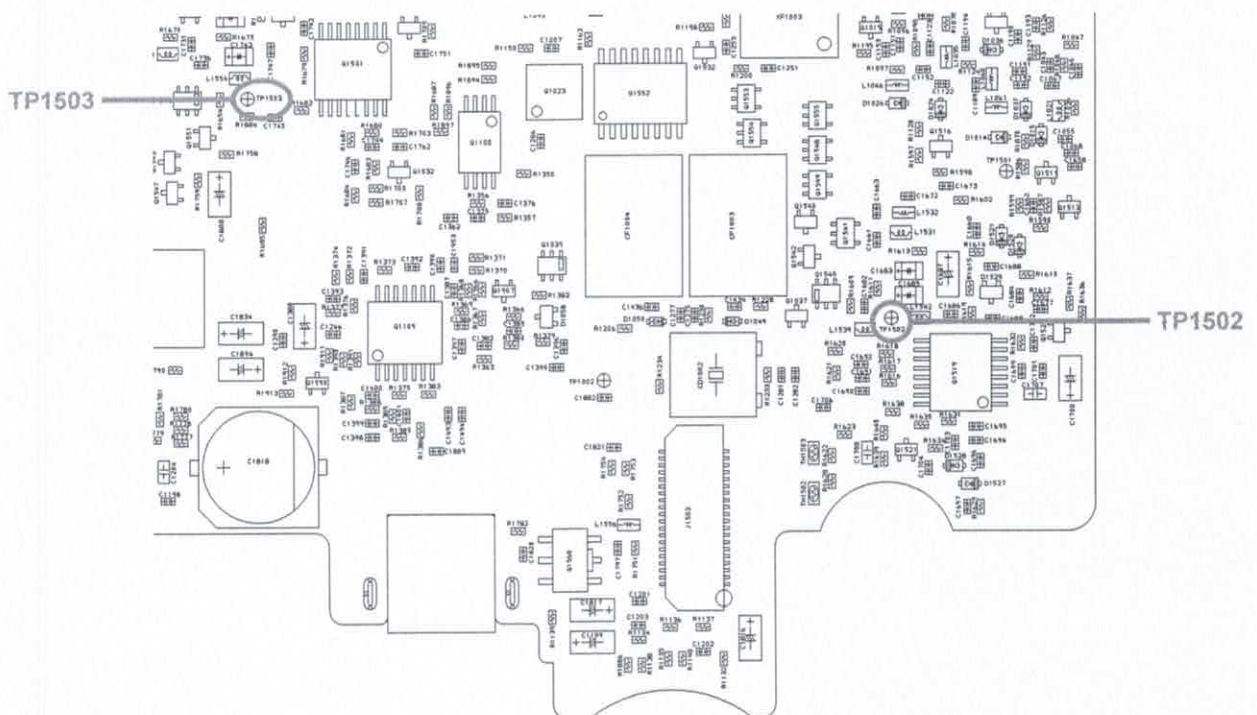
1. Set the power supply voltage to 13.8 V.
2. Press the **[P1]** key of the Microphone to set the alignment menu Item to "Adj 10 BAT".
3. Press the **[P3]** key of the Microphone, to save the new setting.

MAIN

Tune to:	TX/RX	for
440.05 MHz	RX	2.6 ± 0.25 V
440.05 MHz	TX	2.1 ± 0.25 V
146.05 MHz	RX	$1.4 - 0.25$ V/ $+0.30$ V
146.05 MHz	TX	2.2 ± 0.25 V
130.00 MHz	RX	$0.35 \sim 0.70$ V
174.00 MHz	RX	$0.40 \sim 0.70$ V
299.99 MHz	RX	$5.0 \sim 6.1$ V
549.95 MHz	RX	$3.5 \sim 5.3$ V
550.00 MHz	RX	$0.15 \sim 0.35$ V

SUB

Tune to:	TX/RX	for
440.05 MHz	RX	2.6 ± 0.30 V
146.05 MHz	RX	$1.2 - 0.25$ V/ $+0.30$ V
130.00 MHz	RX	0.55 V
174.00 MHz	RX	$0.5 \sim 0.90$ V
299.99 MHz	RX	$5.0 \sim 6.2$ V
549.95 MHz	RX	$3.5 \sim 5.2$ V
550.00 MHz	RX	$0.15 \sim 0.35$ V



Alignment

TX Power Adjustment

1. Press the [P1] key of the Microphone to set the alignment menu Item to "Adj 02 PWR".
2. Set the transceiver frequency to 440.050 MHz.
3. Press the [F(MW)] key, then press the [Tx PWR] to select "LO".
4. Press the [F(MW)] key.
5. Press the PTT switch to activate the transmitter, adjust the **DIAL** knob (Band B) so that RF Power Meter reading is 5.3 W (± 0.5 W).
6. Press the [P2] key of the Microphone to set the alignment menu Item to "Adj 02 DRV".
7. Adjust the **DIAL** knob (Band B) to set the DRV to "9AH".
8. Press the [P2] key of the Microphone to set the alignment menu Item to "Adj 02 PWR".
9. Press the [F(MW)] key, then press the [Tx PWR] to select "MD".
10. Press the [F(MW)] key.
11. Press the PTT switch to activate the transmitter, adjust the **DIAL** knob (Band B) so that RF Power Meter reading is 20 W (± 0.5 W).
12. Press the [P2] key of the Microphone to set the alignment menu Item to "Adj 02 DRV".
13. Adjust the **DIAL** knob (Band B) to set the DRV to "B0H".
14. Press the [P2] key of the Microphone to set the alignment menu Item to "Adj 02 PWR".
15. Press the [F(MW)] key, then press the [Tx PWR] to select "HI".
16. Press the [F(MW)] key.
17. Press the PTT switch to activate the transmitter, adjust the **DIAL** knob (Band B) so that RF Power Meter reading is 50 W (± 0.5 W).
18. Press the [P2] key of the Microphone to set the alignment menu Item to "Adj 02 DRV".
19. Adjust the **DIAL** knob (Band B) to set the DRV to "D0H".
20. Press the [P2] key of the Microphone to set the alignment menu Item to "Adj 02 PWR".
21. Set the transceiver frequency to 146.050 MHz.
22. Press the [F(MW)] key, then press the [Tx PWR] to select "LO".
23. Press the [F(MW)] key.
24. Press the PTT switch to activate the transmitter, adjust the **DIAL** knob (Band B) so that RF Power Meter reading is 5 W (± 0.5 W).
25. Press the [P2] key of the Microphone to set the alignment menu Item to "Adj 02 DRV".
26. Adjust the **DIAL** knob (Band B) to set the DRV to "CFH".
27. Press the [P2] key of the Microphone to set the alignment menu Item to "Adj 02 PWR".
28. Press the [F(MW)] key, then press the [Tx PWR] to select "MD".
29. Press the [F(MW)] key.
30. Press the PTT switch to activate the transmitter, adjust the **DIAL** knob (Band B) so that RF Power Meter reading is 20 W (± 0.5 W).
31. Press the [P2] key of the Microphone to set the alignment menu Item to "Adj 02 DRV".
32. Adjust the **DIAL** knob (Band B) to set the DRV to "DAH".
33. Press the [P2] key of the Microphone to set the alignment menu Item to "Adj 02 PWR".
34. Press the [F(MW)] key, then press the [Tx PWR] to select "HI".
35. Press the [F(MW)] key.
36. Press the PTT switch to activate the transmitter, adjust the **DIAL** knob (Band B) so that RF Power Meter reading is 50 W (± 0.5 W).
37. Press the [P2] key of the Microphone to set the alignment menu Item to "Adj 02 DRV".
38. Adjust the **DIAL** knob (Band B) to set the DRV to "EFH".
39. Press the [P2] key of the Microphone to set the alignment menu Item to "Adj 02 PWR".