UHF TRANSMITTER ALIGNMENT

1. The transmitter must be terminated with an UHF-rated wattmeter with a 50-ohm resistive dummy load capable of dissipating at least 125 watts.

2. Key the transmitter **only** while making adjustments.

3. All coil slugs should be within the limits of the coil form or casting when the transmitter is properly tuned.

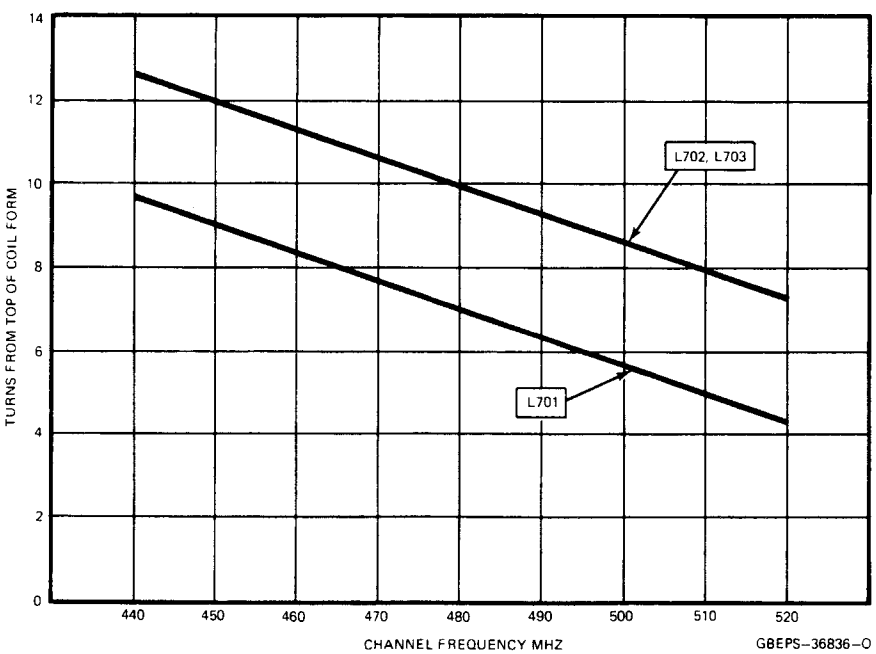
4. FLO = Lowest transmit channel frequency, and
   FHI = Highest transmit channel frequency.

5. The transmitter alignment procedure should be performed using Model TRN5080A DC Metering Chassis, or Motorola TEK-5 Meter Panel (set to position "D" for exciter or "E" for PA), or Motorola S1056-1059 Portable Test Set (used with TEK-37A Test Set Adapter).

CAUTION

Do not key transmitter for more than a few seconds at a time, until it is properly tuned. Key transmitter for brief periods while reading meter and making adjustments.

EXCITER COIL PRESET CHART



Exciter-PA Alignment Procedure

Step	Metering Cable Connection	Test Switch Position (Meter)	Freq.	Adjust	Procedure
1	None	None	FLO	Frequency Select	Set to lowest transmit channel (FLO) frequency (multi-channel transmitters only).
			FLO	R911, R931, R939 (on power control board)	Set to mid-rotation.
			FLO	L701, L702, L703	Set slugs per Exciter Coil Preset Chart.
			FLO	L704 thru L708	Set slugs to TOP of coil form, away from printed circuit board.
			FLO = 440 to 480 MHz	L709 thru L712	Set slugs 1-1/2 cm above filter casting.
			FLO = 480 to 520 MHz	L709 thru L712	Set slugs flush with top of lock nuts.
2	Exciter J3	M1	FLO	L701, L702, L703	Peak L702, then Peak L701, L702, and L703, in that order, until no further improvement is obtained.
3	Exciter J3	M1	FLO	L704, L705	Dip L704, then Peak L705
4	Exciter J3	M2	FLO	L704 thru L707	Peak L706, L707, L704, L705, L706, and L707, in that order, until no further improvement is obtained.
If aligning 1-frequency transmitters, or if overall channel separation is less than 1.5 MHz, skip to Step 9.					
5	Exciter J3	M1	FHI	L702	Peak.
6	Exciter J3	M2	FHI	L704, L706	Peak L704, then Peak L706.
7	Exciter J3	M1	FLO	L701, L703	Peak L701, then Peak L703.
8	Exciter J3	M2	FLO	L705, L707	Peak L705, then Peak L707.
9	Exciter J3	M2	FLO	L708	Dip.
10	Exciter J3	M3	FLO	L709	Peak.
11	Exciter J3	M3 or M2	FLO	L708	Peak on M3. If no obvious peak occurs, Dip on M2.
12	Exciter J3	M3	FLO	L709 thru L712	Peak L709, Dip L710, Peak L711, and Dip L712.
This completes the exciter alignment for 1-frequency transmitters, or if overall channel separation is less than 5 MHz. Otherwise, go to Step 13.					
13	None	None	—	L710, L711	Set 1/8-turn (45°) CCW if multi-channel, or if overall channel separation is greater than 5 MHz.
14	Transmit Antenna Connector	Wattmeter	FHI	R911, R931, R939	Set R931 and R939 full CW. If FHI is less than 470 MHz, adjust R911 for 110 watts. If FHI is between 470 - 494 MHz, adjust R911 for 95 watts. If FHI is greater than 494 MHz, adjust R911 for 90 watts.
15	Power Control Board J1	M1	—	Frequency Select	Determine channel with highest M1 reading. Record channel and reading. CHANNEL:_____ M1 READING:_____
16	Power Control Board J1	M5	—	Frequency Select	Determine channel with highest M5 reading. Record channel and reading. CHANNEL:_____ M5 READING:_____
17	Power Control Board J1	M1	—	R911, R931, and Frequency Select	Set R911 full CW. Select channel determined in Step 15. Adjust R931 for reading 3 uA ABOVE M1 reading obtained in Step 15. If full 3 uA rise cannot be obtained, set R931 full CW, re-read M1, and adjust R931 for reading 0.5 uA BELOW new M1 reading. Record new M1 reading.
18	Power Control Board J1	M5	—	R939, and Frequency Select	Select channel determined in Step 16. Adjust R939 for reading 2 uA ABOVE M5 reading obtained in Step 16. If full 2 uA rise cannot be obtained, set R939 full CW, re-read M5, and adjust R939 for reading 0.5 uA BELOW new M5 reading. Record new M5 reading.
Disconnect Test Set metering cables **BEFORE** performing Step 19.					
19	Transmit Antenna Connector	Wattmeter	FHI	R911, and Frequency Select	Select channel with lowest power output. If FHI is less than 470 MHz, adjust R911 for a minimum power output of 110 watts. If FHI is between 470 - 494 MHz, adjust R911 for a minimum power output of 95 watts. If FHI is greater than 494 MHz, adjust R911 for a minimum power output of 95 watts.
This completes the PA alignment for all UHF transmitters.					

OSCILLATOR FREQUENCY ADJUSTMENT

Setting oscillator frequency should be done AFTER exciter-power amplifier alignment, but BEFORE transmitter deviation is set. To set oscillator on frequency, perform the following procedure:

Step 1. Select transmitter operating frequency F1. Connect frequency meter to transmit antenna connector via a dummy load (refer to instructions provided with meter).

Step 2. Key transmitter with no modulation.

NOTE

On stations equipped with *Private-Line* or *Digital Private-Line* signaling, the PL/DPL encoder must be disabled. This is accomplished by grounding pin 14 of the PL/DPL module position on the backplane interconnect board.

Step 3. Adjust F1 FREQ control for proper reading on frequency meter. If the frequency, as indicated on the frequency meter is too low, turn the F1 FREQ control clockwise. If the frequency is too high, turn the F1 FREQ control counterclockwise. Set frequency within ± 100 Hz.

NOTE

Omit Steps 4 and 5 for 1-frequency stations.

Step 4. Select transmitter operating frequency F2, and repeat Step 3 using F2 FREQ control.

Step 5. Repeat Step 4 for F3 and F4 using F3 FREQ and F4 FREQ controls, respectively.

INSTANTANEOUS DEVIATION CONTROL (IDC) OF TRANSMITTER MODULATION ADJUSTMENT

NOTE

The Oscillator Frequency Adjustment must be made prior to this adjustment.

Step 1. Connect the output leads of an audio oscillator, through a 0.33 uF ± 5%, 50 V capacitor (Motorola Part No. 8-11023A31), to exciter pins 12 (EXCITER AUDIO HI) and 11 (EXCITER AUDIO LO).

Step 2. Connect an ac voltmeter across the same terminals, and adjust the audio oscillator output to 350 mV rms at 1000 Hz.

Step 3. Connect a deviation monitor to the transmit antenna connector via a dummy load (refer to instructions provided with monitor).

Step 4. Key transmitter and adjust F1 IDC while observing deviation monitor. Adjust control for 4.7 kHz deviation.

NOTE

If station transmits *Private-Line* or *Digital Private-Line* signals, PL/DPL deviation with audio oscillator disconnected should now be between 0.5 and 1 kHz.

Step 5. Repeat Step 4 for each frequency used, adjusting the IDC control corresponding to each channel.

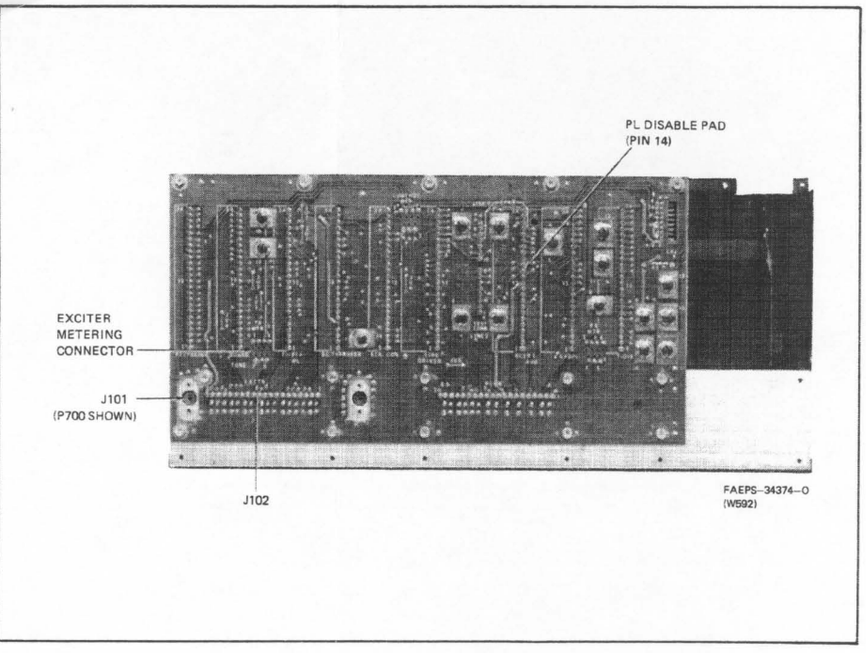


Figure 1. Basic Chassis Exciter Metering Connection Detail

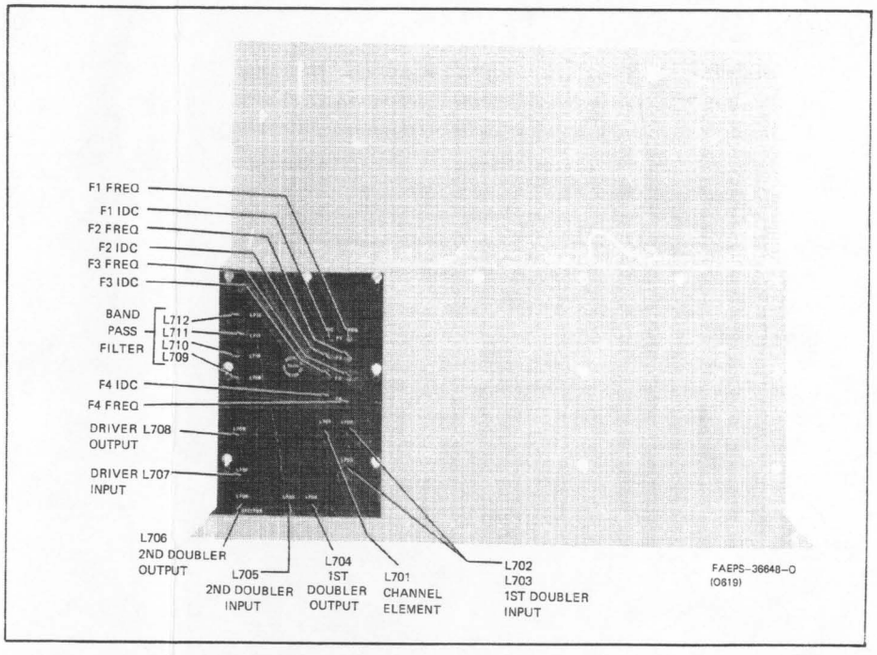


Figure 3. Exciter Adjustment Location Detail

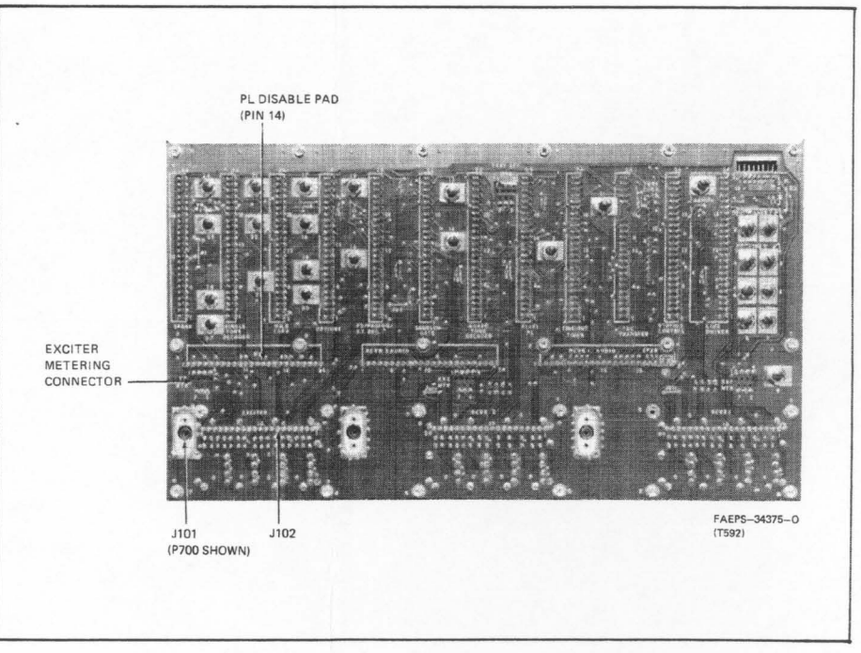


Figure 2. Fully Optionable Chassis Exciter Metering Connection Detail

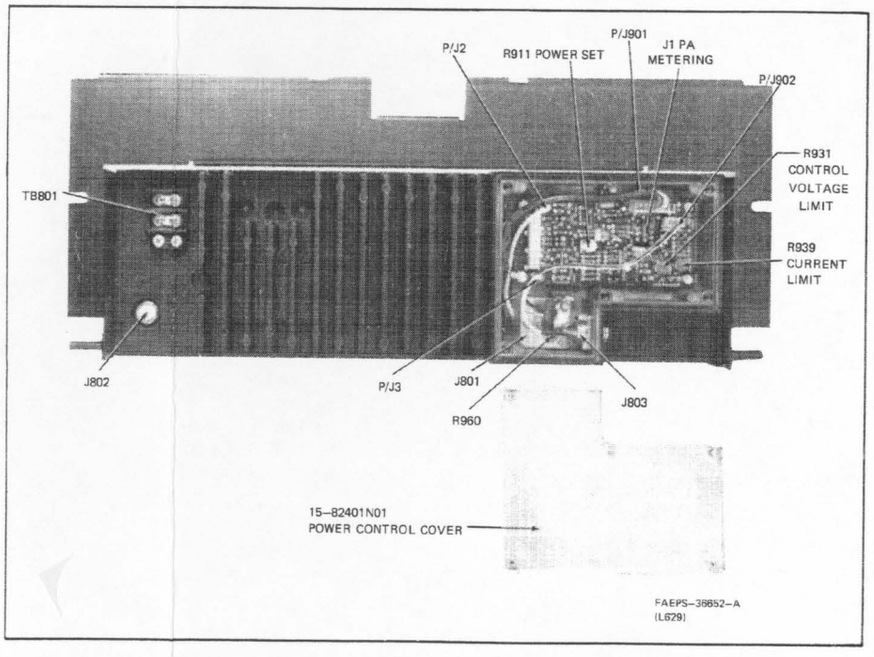


Figure 4. PA Deck (Power Control Board) Adjustment Location Detail