TRANSMITTER ALIGNMENT

EQUIPMENT REQUIRED

1. GE Test Set Model 4EX3A11 or Test Kit 4EX8K12.
2. A 50-ohm wattmeter connected to antenna jack J906.
3. A frequency counter.

PRELIMINARY CHECKS AND ADJUSTMENTS

1. Place ICOMs on Exciter Board (crystal frequency = operating frequency ÷ 36).
2. For a large change in frequency or a badly mis-aligned transmitter, preset all slugs to the top of the coil form.
3. Set output impedance matching capacitor C175 to 1/3 mesh.
4. Set all other air variable capacitors to minimum capacity (not meshed).

NOTE

The tuning frequency for multi-frequency transmitters is determined by the operating frequency and the frequency spread between transmitters. Refer to the table below for maximum frequency spread.

5. For multi-frequency transmitters with a frequency spread less than that specified in column (1) tune the transmitters to the lowest frequency. For a frequency spread exceeding the limits specified in column (1) tune the transmittters using a center frequency tune up crystal module or ICOM as required. The maximum frequency spread can be extended to the limits specified in column (3) with 1 dB degradation.

Multi-Frequency Transmitter Tuning

Transmitter Frequency Range	MAXIMUM FREQUENCY SPREAD		
	(1) Without center tuning	(2) With center tuning	(3) With center tuning (1 dB degradation)
406 - 470 MHz	2.75 MHz	5.50 MHz	9.00 MHz
470 - 494 MHz	2.90 MHz	5.80 MHz	9.50 MHz
494 - 512 MHz	3.00 MHz	6.00 MHz	9.75 MHz

6. Connect the red plug on the GE Test Set to the System Board metering jack, and the black plug to the exciter metering jack. Set the polarity to +, and set the range to the Test 1 position (1 Volt position for 4EX8K12) for all adjustments.

   NOTE: With the Test Set connected to the PA metering jack, the voltage reading at position "F" with the HIGH SENSITIVITY button pressed may be converted to driver collector current by reading the current as 15 amperes full scale. The voltage reading at position "G" with the HIGH SENSITIVITY button pressed may be converted to PA collector current by reading the current as 30 amperes full scale.

7. All adjustments are made with the transmitter keyed. Unkey the transmitter between steps to avoid unnecessary heating.

NOTE

When the need for minor adjustments to the transmitter are indicated, perform steps 11 through 15 for a quick transmitter tune-up.

ALIGNMENT PROCEDURE

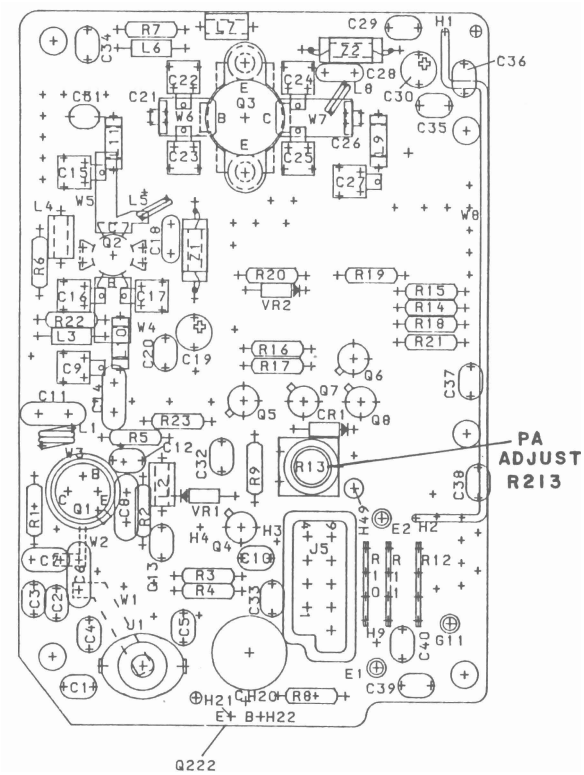
STEP	METER POSITION		TUNING CONTROL	METER READING	PROCEDURE
	GE TEST SET	INTERNAL METERING			
					NOTE: When aligning transmitter, proceed as instructed below. DO NOT retune a previously tuned control unless specifically directed to do so.
1.	B (MULT-1)	2 (MULT-1)	T101 & T102	See Procedure	Then tune T101 for a dip (small) in meter reading and tune T102 for maximum meter reading.
2.	C (MULT-2)	3 (MULT-2)	T103 and T104	See Procedure	Tune T103 for maximum meter reading, then tune T104 for a dip in meter reading.
3.	D (MULT-3)	4 (MULT-3)	T105 and T106	See Procedure	Tune T105 for maximum meter reading and then tune T106 for a dip in meter reading.
4.	F (MULT-4)	5 (MULT-4)	T107 and C155	See Procedure	Tune T107 for maximum meter reading and then tune C155 for a dip in meter reading.
5.	G (AMPL-1)	6 (AMPL-1)	C157 and C167	See Procedure	Tune C157 for maximum meter reading, and then tune C167 for a dip in meter reading.
6.	D (AMPL-1)	8 (AMPL-1 DRIVE on PA)	C171 and C175	Maximum	Move black Test Set plug to PA metering jack and tune C171 and then C175 for maximum meter reading.
7.	C (MULT-2)	3 (MULT-2)	T101, T102 & T103	Maximum	Move black Test Set plug to exciter metering jack and sequentially tune T101, T102 and T103 for maximum meter reading.
8.	D (MULT-3)	4 (MULT-3)	T104 and T105	Maximum	Tune T104 and then T105 for maximum meter reading.
9.	F (MULT-4)	5 (MULT-4)	T106 and T107	Maximum	Tune T106 and then T107 for maximum meter reading.

ALIGNMENT PROCEDURE (Cont'd)

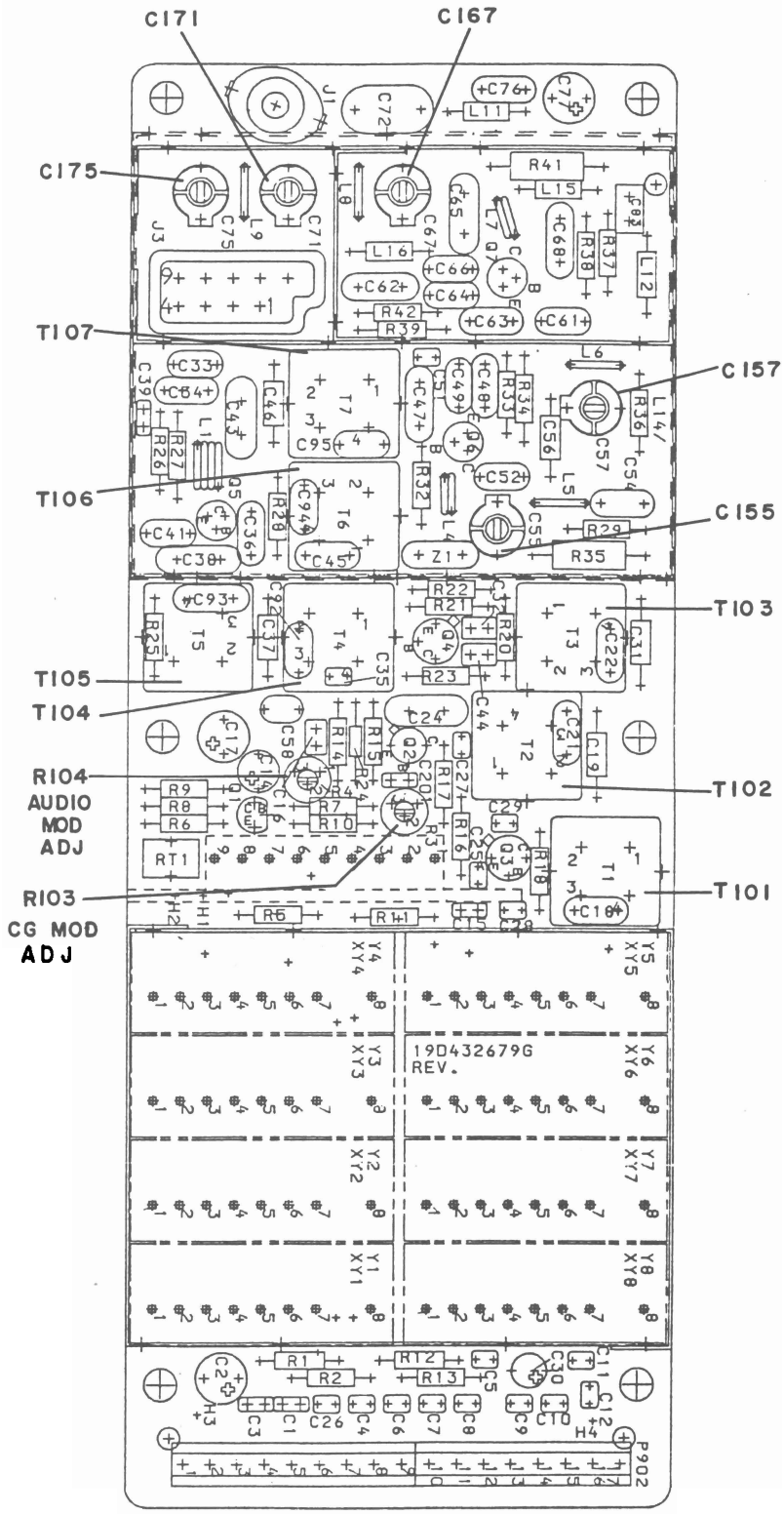
STEP	METER POSITION: GE TEST SET	METER POSITION: INTERNAL METERING	TUNING CONTROL	METER READING	PROCEDURE
10.	D (AMPL-1)	8 (AMPL-1)	C155, C157, C167 C171 & C175	Maximum	Move black Test Set plug to PA metering jack and sequentially tune C155, C157, C167, C171 and C175 for maximum meter reading.
					NOTE A quick transmitter tune-up procedure is provided in Steps 11 through 15.
11.	C (MULT-2)	3 (MULT-2)	T101, T102, and T103	Maximum	Move black Test Set plug to exciter metering jack and alternately tune T101, T102 and T103 for maximum meter reading.
12.	D (MULT-3)	4 (MULT-3)	T104 and T105	Maximum	Alternately tune T104 and T105 for maximum meter reading.
13.	F (MULT-4)	5 (MULT-4)	T106 and T107	Maximum	Alternately tune T106 and T107 for maximum meter reading.
14.	D (AMPL-1)	8 (AMPL-1)	C155,C157,C167, C171, and C175	Maximum	Move black Test Set plug to PA metering jack and alternately tune C155, C157, C167, C171, and C175 for maximum meter reading. For optimum operation repeat Steps 11 through 14.
15.			R213		Refer to Table 1 to determine the proper battery or collector voltage when adjusting the output power. Set Power Adjust potentiometer R213 on the PA driver board for the desired power output. If the battery voltage or collector voltage is not as specified in Table 1 and full rated output is desired, set R213 for the output power according to the battery voltage or collector voltage shown in Figure 8. **NOTE** The PA collector voltage is measured as described in the PA POWER INPUT section.

RATED POWER OUTPUT	MIN POWER SETTING	BATTERY VOLTAGE	PA COLLECTOR VOLTAGE
100W	30W	13.4	12.0
75W	20W	13.6	13.0
40W	12W	13.6	13.4
20W	10W	13.4	13.0

TABLE 1 - Power/Voltage Cross Reference



406-512 MHz, 75 WATT TRANSMITTER (CONT'D)



406-512 MHz, 75 WATT TRANSMITTER (CONT'D)