

# **ALIGNMENT      PROCEDURE**

MODEL: 200GTL

REVISION: 1.2

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PREPARED BY: BURKE

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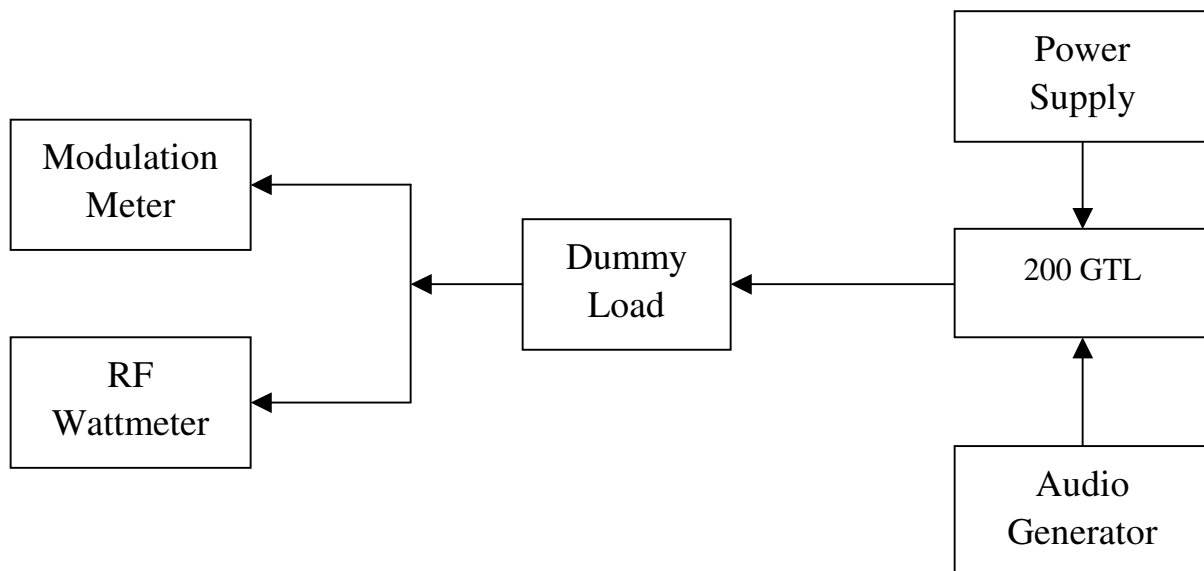
## 200GTL ALIGNMENT INSTRUCTION

### 1 TEST CONDITION:

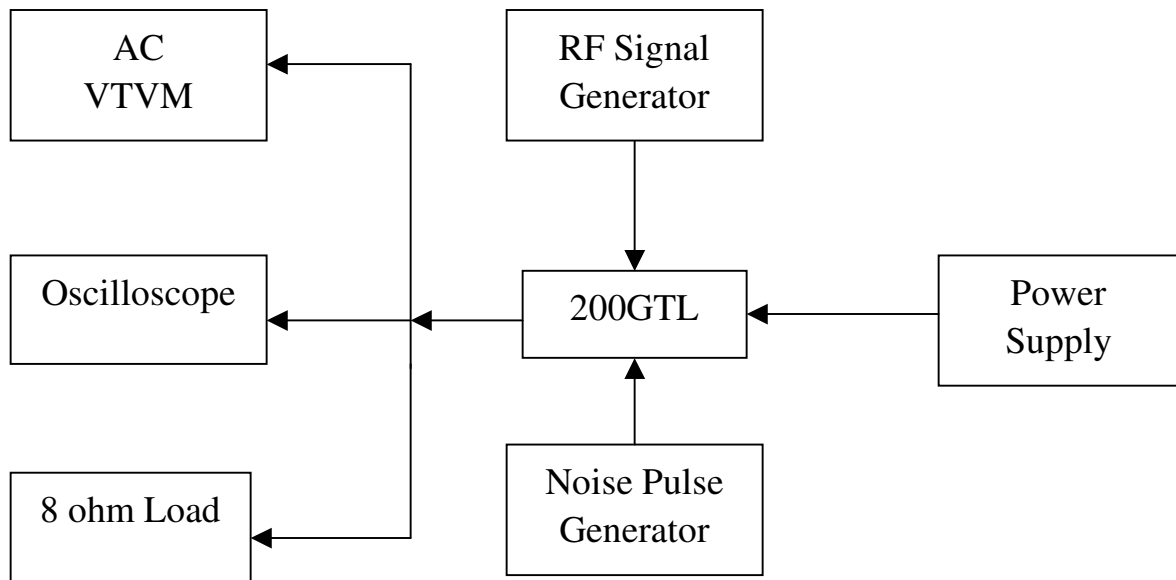
- 1.0. TEST TEMPERTAURE: 77  $\pm$ 9 °F
- 1.1. STANDARD DC POWER: 13.8VDC
- 1.2. STANDARD AUDIO LOADING: 8  $\Omega$
- 1.3. ANTENNA IMPEDANCE: 50  $\Omega$
- 1.4. STANDARD REF. MODULATION:  
AM 30%  
FM 2.5KHz
- 1.5. PULSE GENERATOR: 1 $\mu$ S pulse @ 100mS and 1V peak-to-peak amplitude,  
with rise and fall time of less than 10nS.

### 1.6. TEST EQUIPMENT SETUP AS BELOW:

#### A. TX test equipment setup:



## B. RX test equipment setup:

**2.0 MAIN ALIGNMENT**

## 2.1 PLL Alignment

STEP	PRESET TO	CONNECTIONS	ADJUST	PROCEDURE
1	RX mode, AM, 28.000MHz	Oscilloscope to TP1 (junction of R92-C607)	T712	Check for range of 0.2 to 7VDC, then set to 2.8V
2	Same as step 1	Oscilloscope to TP2 (forward end of BF9)	T713	Adjust for maximum output
3	Same as step 1	Frequency counter to TP2 (forward end of BF9)	T711	Adjust for 17.305MHz (frequency – 10.695)

## 2.2 Carrier Alignment

STEP	PRESET TO	CONNECTIONS	ADJUST	PROCEDURE
1	TX mode, AM, 28.000MHz	Frequency counter to TP3	T716	Adjust for 10.695MHz
2	RX mode, LSB, 28.000MHz	Same as step 1	T714	Adjust for 10.6975MHz
3	RX mode, USB, 28.000MHz	Same as step 1	T715	Adjust for 10.6925MHz

### 3.0 RECEIVER ALIGNMENT

Connect an AC VTVM with 8 ohm load across speaker coil.

Adjust volume control to obtain a suitable indication.

Set generator output low enough to prevent AGC limiting.

Preset controls as follows, unless otherwise noted:

**RF Gain** maximum, **Squelch** minimum, **NB/ANL** off.

STEP	PRESET TO	CONNECTIONS	ADJUST	PROCEDURE
1	RX mode, AM 28.000MHz	Output of signal generator to antenna connector. Freq. = 28.000MHz, 1KHz 30% modulation, RF output 1 $\mu$ V	T703, T704, T705, T706, T707, T708, T710	Adjust for maximum signal on VTVM
2	Same as step 1, squelch to maximum	Output of signal generator to antenna connector. Freq. = 28.000MHz, 1KHz 30% modulation, RF output 1500 $\mu$ V	RV2	SQUELCH RANGE Adjust just until squelch opens
3	RX mode, AM 29.500MHz (Band D)	Output of signal generator to antenna connector. Freq. = 29.500MHz, NO modulation, RF output 100 $\mu$ V	RV15	SIGNAL METER Adjust for a reading of S-9 on the analog meter of the radio
4	RX mode, AM, 28.000MHz, NB/ANL switch set to NB/ANL	Output of signal generator and noise pulse generator to antenna connector. Freq. = 28.000MHz, 1KHz 30% modulation, RF output 1 $\mu$ V. Oscilloscope to collector of Q6	T701	NOISE BLANKER Adjust for maximum amplitude on oscilloscope
5	RX mode, FM, 28.000MHz	Output of signal generator to antenna connector. Freq. = 28.000MHz, 2.5KHz deviation, RF output 1 $\mu$ V	T702	Adjust for maximum signal on VTVM

#### 4.0 TRANSMITTER ALIGNMENT

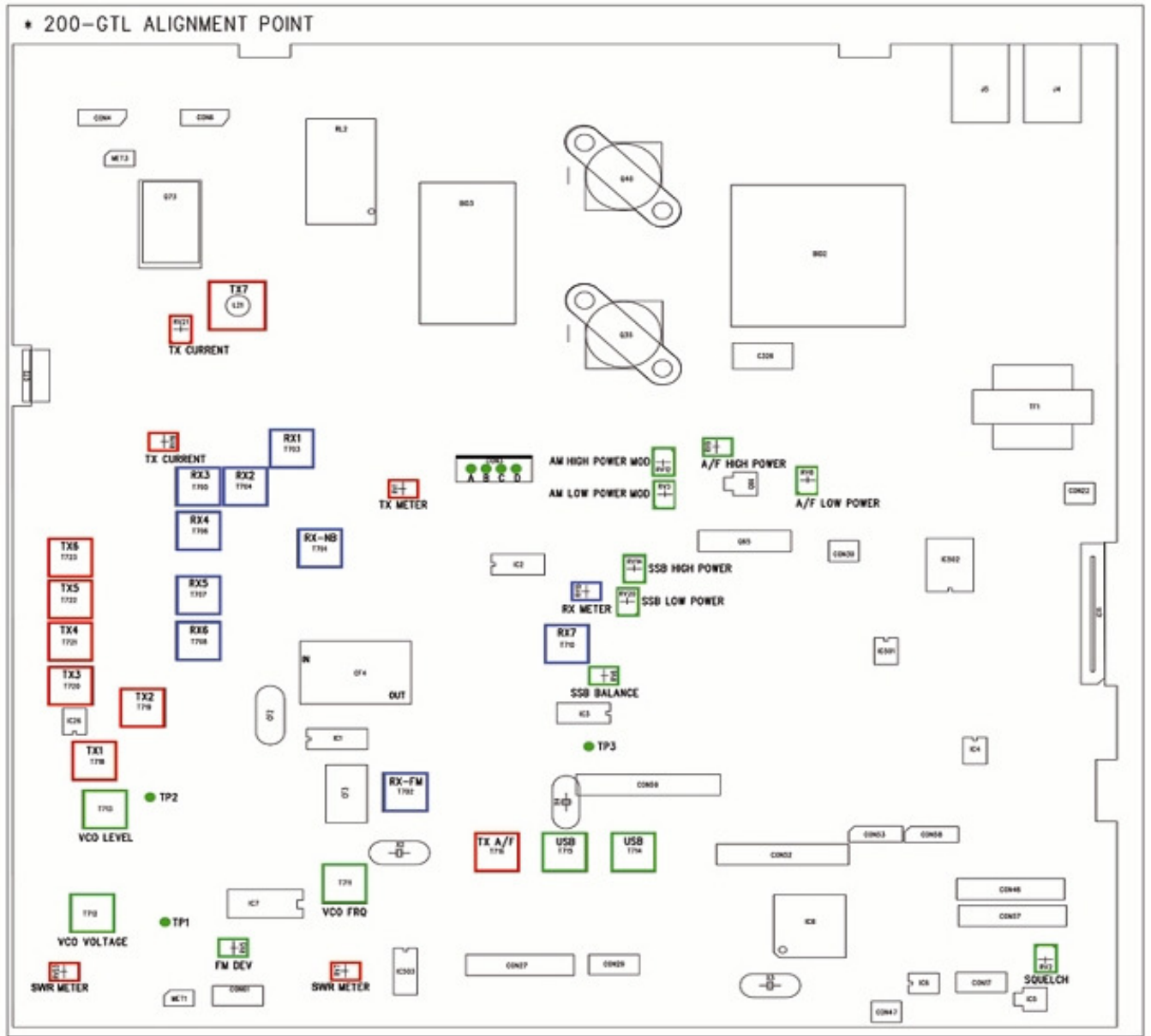
Maintain a 50 ohm 25 watt dummy load on the antenna connector for the following steps. Preset controls as follows, unless otherwise noted:

**RF Power** set to HI, **Mic Gain** to minimum.

STEP	PRESET TO	CONNECTIONS	ADJUST	PROCEDURE
1	TX mode, LSB, 29.700MHz	Insert a current meter between pins A(+) and B(-) of CON3	RV21	BIAS CURRENT Adjust for 1.3 amps
2	Same as step 1	Insert a current meter between pins C(+) and D(-) of CON3	RV19	BIAS CURRENT Adjust for 60mA
3	TX mode, AM, 29.700MHz	RF wattmeter to antenna connector	T718, T719, T720, T721, T722, T723, L21	Adjust for maximum RF output
4	TX mode, AM, 29.700MHz	RF wattmeter to antenna connector	RV9	RF POWER – HI Adjust for 32 watts
5	Same as step 4, Power switch to LO	Same as step 4	RV8	RF POWER - LO Adjust for 4 watts
6	TX mode, AM, 29.700MHz Power switch to HI		RV1	RF POWER METER Adjust for a reading of S-7 on the analog meter of the radio
7	TX mode, AM, 29.700MHz Mic Gain to maximum	Modulation meter to antenna connector. Insert a 1KHz, 30mV signal to microphone input.	RV12	AMC CONTROL - HI Adjust for 90% modulation
8	Same as step 7, Power switch to LO	Same as step 7	RV3	AMC CONTROL - LO Adjust for 90% modulation
9	TX mode, FM, 29.700MHz Mic Gain to maximum	Deviation meter to antenna connector. Insert a 1KHz, 30mV signal to microphone input.	RV5	DEVIATION LIMITER Adjust for 2.9KHz deviation
10	TX mode, LSB, 29.700MHz Mic Gain to maximum	RF wattmeter to antenna connector. Insert a 1KHz, 30mV signal to microphone input.	RV14	SSB POWER – HI Adjust for 100 watts
11	Same as step 10 Power switch to LO	Same as step 10	RV20	SSB POWER – LO Adjust for 12 watts
12	TX mode, LSB, 29.700MHz Mic Gain to minimum	Oscilloscope to antenna connector.	RV6	Adjust for minimum output

**TRANSMITTER ALIGNMENT** (continued)

STEP	PRESET TO	CONNECTIONS	ADJUST	PROCEDURE
13	TX mode, AM, Power switch to HI, Mic Gain to minimum, S/RF switch set to CAL	Connect a 100 ohm dummy load to the antenna connector	RV23	SWR METER Adjust SWR Cal knob so analog meter on radio goes to CAL mark. Then set S/RF switch to SWR and adjust RV23 for an SWR reading of 2 on the analog meter of the radio.
14	Same as step 13 Power switch to LO	Same as step 13	RV7	SWR METER Same as step 13 except adjust RV7 for a reading of 2 on the analog meter
15	TX mode, AM, Power switch to LO, Mic Gain to minimum	Short the antenna output to ground	RV4	ANTENNA LIGHT Adjust RV4 until the antenna light just comes on



**REVISION HISTORY**

1.0 – Initial release.

1.1 – Corrected step 2 in section 2.2 (changed USB to LSB).  
Corrected step 3 in section 2.2 (changed LSB to USB).

1.2 – Added Step 15 in Section 4