

# **ALIGNMENT      PROCEDURE**

MODEL: 150GTL

REVISION: 1.1

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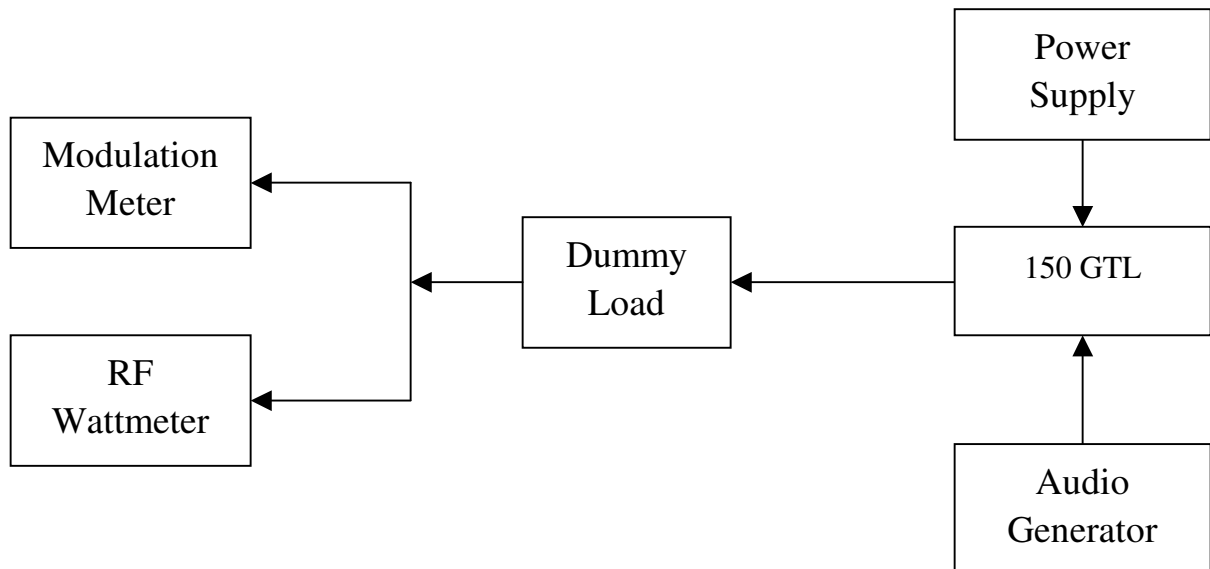
# 150GTL ALIGNMENT INSTRUCTION

## 1 TEST CONDITION:

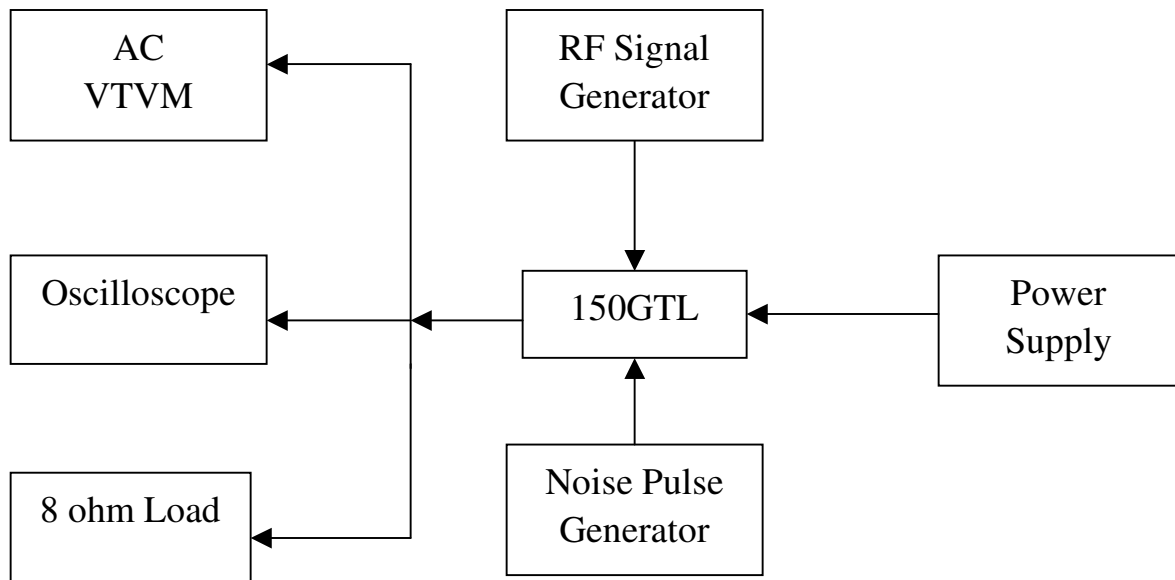
- 1.0. TEST TEMPERTAURE:  $77 \pm 9$  °F
- 1.1. STANDARD DC POWER: 13.8VDC
- 1.2. STANDARD AUDIO LOADING:  $8 \Omega$
- 1.3. ANTENNA IMPEDANCE:  $50 \Omega$
- 1.4. STANDARD REF. MODULATION:  
AM 30%  
FM 2.5KHz
- 1.5. PULSE GENERATOR:  $1\mu\text{S}$  pulse @ 100mS and 1V peak-to-peak amplitude, with 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	T712	Check for range of 0.2 to 7VDC, then set to 2.8V
2	Change to Band D	Oscilloscope to TP1		DC level should be < 6V
3	Same as step 1	Oscilloscope to TP2	T713	Adjust for maximum output
4	Same as step 1	Oscilloscope to 4th test point of CON2	T717	Adjust for maximum output
5	Same as step 1	Frequency counter to TP3	CT1	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	CT2	Adjust for 28.000MHz

### 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	Same as step 1	Output of signal generator to antenna connector. Freq. = 28.000MHz, 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

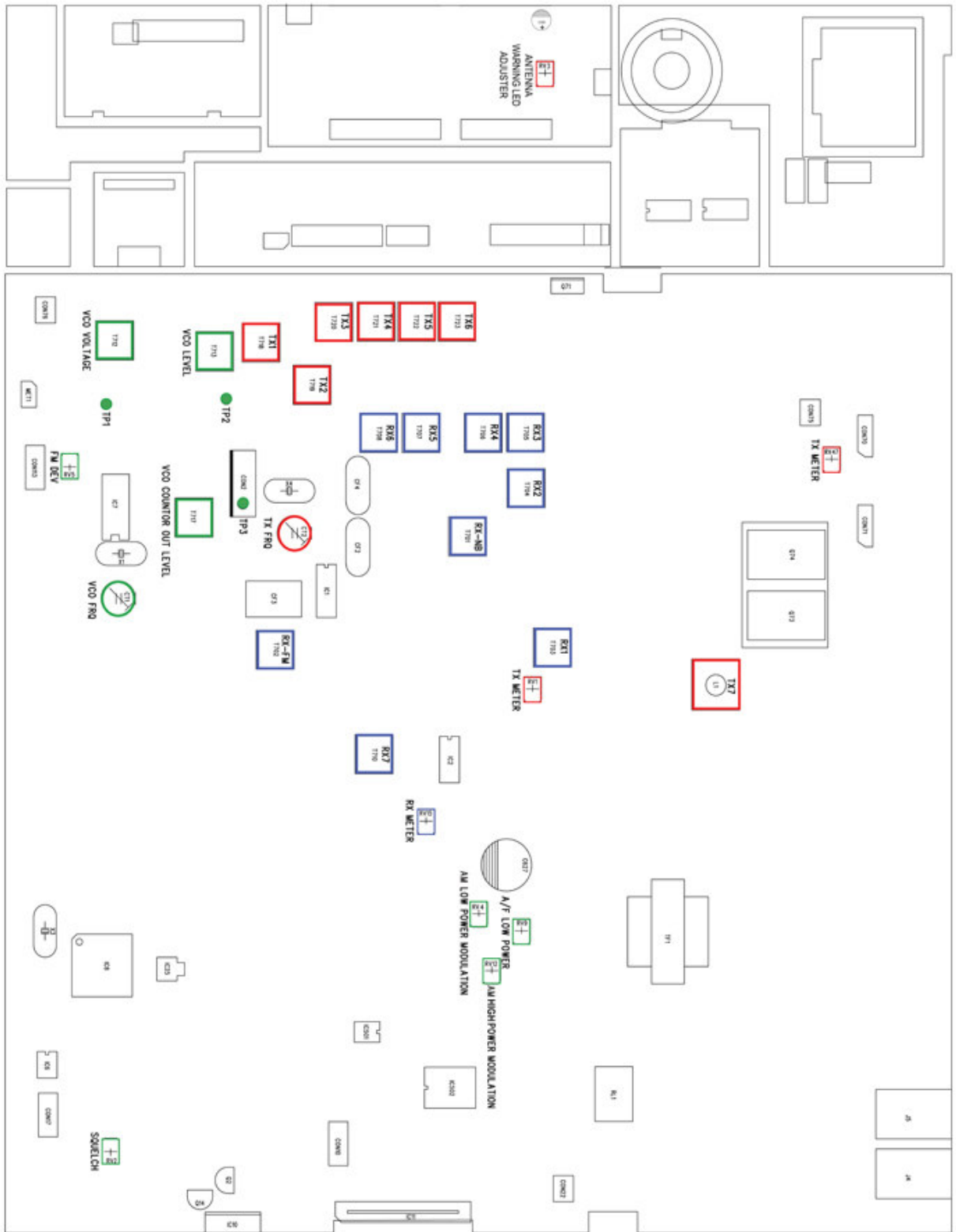
Maintain a 50 ohm 25 watt dummy load on the antenna connector for the following steps.

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, AM, 29.700MHz	RF wattmeter to antenna connector	T718, T719, T720, T721, T722, T723	Adjust for maximum RF output
2	Same as step 1	Same as step 1	L21	RF POWER - HI Adjust for 13-17 watts on all bands
3	Same as step 1, Power switch to LO	Same as step 1	RV9	RF POWER - LO Adjust for 4 watts

STEP	PRESET TO	CONNECTIONS	ADJUST	PROCEDURE
4	TX mode, AM, 29.700MHz		RV1	<b>RF POWER METER</b> Adjust for a reading of S-9 on the analog meter of the radio
5	TX mode, AM, 29.700MHz Mic Gain to maximum	Modulation meter to antenna connector. Insert a 1KHz, 30mV signal to microphone input.	RV12	<b>AMC CONTROL - HI</b> Adjust for 90% modulation on all bands
6	Same as step 5, Power switch to LO	Same as step 5	RV4	<b>AMC CONTROL - LO</b> Adjust for 90% modulation on all bands
7	TX mode, FM, 29.700MHz Mic Gain to maximum	Same as step 5	RV5	<b>DEVIATION LIMITER</b> Adjust for 2.5KHz deviation
8	TX mode, AM, Power switch to LO, Mic Gain to minimum, S/RF switch set to CAL	Connect a 100 ohm non-inductive dummy load to the antenna connector	RV17	<b>SWR METER</b> Adjust SWR Cal knob so analog meter on radio goes to CAL mark. Then set S/RF switch to SWR and adjust RV17 for an SWR reading of 2 on the analog meter of the radio.
9	TX mode, AM, Power switch to LO, Mic Gain to minimum	Short the antenna output to ground	RV3 (located on back of front panel)	<b>ANTENNA LIGHT</b> Adjust RV3 just until the antenna light comes on



**\* 150 GTL ALIGNMENT POINTS**

**REVISION HISTORY**

1.0 – Initial release

1.1 – Added section Step 9 in Section 4