

Exhibit D – Tune Up Procedures

The following tune up procedure is taken from the Production Test Requirements for the TTR-921/TTR-4000 Transmitter Assembly:

TRANSMITTER PEAK POWER TUNING (MODE C)

COLLECTOR VOLTAGE ADJUSTMENTS

PROCEDURE

- 1) Set the UUT to mode C transmit mode
- 2) Set Whisper Shout settings to 0db attenuation
- 3) Adjust the following pulse and dc voltage levels to within **+0.1vdc**
- 4) Attach oscilloscope probe to E51, adjust modulator R131 for **48vdc**
- 5) Attach oscilloscope probe to E45, adjust modulator R 97 for **32vdc**
- 6) Attach oscilloscope probe to E41, adjust modulator R136 for **45vdc**
- 7) Attach oscilloscope probe to E42, adjust modulator R144 for **45vdc**
- 8) Attach oscilloscope probe to E40, adjust modulator R154 for **45vdc**

TUNING THE PA

PROCEDURE

- 1) Set the UUT to mode C transmit mode
- 2) Set Whisper Shout settings to 0db attenuation

Caution: Always keep adequate attenuation on RF output at all time because the PA can start Transmitting at any time when the tuning gets close to the correct values.

- 3) It is suggested to “preset” all tuning caps to the middle of their range before testing. A closer preset condition is to try and match the cap tuning on an already tuned P.A. Usually it is necessary to tap in to the output of Q2 and get Q1 and Q2 tuned first. (See Note:) Then, the entire amp chain can usually be tuned.
- 4) Adjust PA Plate piston caps for peak pulse amplitudes.
- 5) Output Power 57.95 dbm +/- 0.5 dbm

Note: To tune the TCAS PA it may be necessary to “Tap In” to the Amplifier Chain and tune part or parts of the Amplifier Chain individually. This is done by desoldering a series cap, rotating it 90 degrees, and soldering it to the center conductor of a tune stub (a piece of RG316 coaxial cable 6” to 8” long with a SMA connector on one end.). The shield of the coaxial cable is soldered to ground. Connect SMA connector through correct attenuators to Power Meter. Use the following chart as guide for tuning PA using this procedure.

Stage	Input Tune Cap	Output Tune Cap	Series Cap Rotate 90 Deg.	Approximate Power Output
Q1	C15	C8	C7	31.5 dbm
Q2	C9	C10	C12	40.5 dbm
Q3	C16	C17	C21	48.0 dbm
Q4	C24	C27	C28	53.5 dbm
Q5 and Q6	C46 and C48	C49 and C53	None	60.7 dbm