

3 T828 Initial Adjustment

The following section describes the full adjustment procedure to be carried out before operating the T828.

Note: The T828 requires no RF tuning or alignment.

Refer to Section 5 where the parts lists, grid reference index and diagrams will provide detailed information on identifying and locating components.

The following topics are covered in this section.

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3.1 Test Equipment Required

- DC power supply capable of delivering 15A at 13.8V (e.g. Tait T807).
- Multimeter or DMM (e.g. Fluke 77).
- RF power meter usable 66-88MHz (e.g. Bird 43 with 5 & 100W elements).
- Thru-line wattmeter with 5W element.
- 100W 3dB 50 ohm pad.
- 'BNC' to 'N' type adaptors (e.g. Amphenol, Greenpar).
- Appropriate trimming tools.
- Special connector 50 ohm BNC to SMC female.

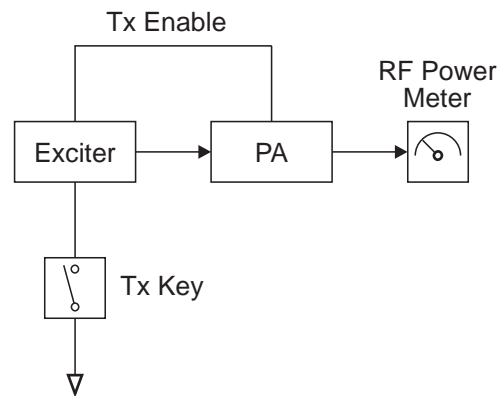


Figure 3.1 Test Equipment Set-up

3.2 Optimising Intermodulation Performance

Note: If the T828 is to be used in countries where intermodulation performance is a Type Approval requirement (e.g. Europe, UK), or if intermodulation performance is of particular concern, the two 50 ohm Teflon coax phasing sections provided must be fitted.

3.2.1 Trimming

The Teflon phasing sections supplied are cut for 66MHz. If the required operating frequency is greater than 66MHz, you must trim both sections to the correct length according to the following formula:

$$\text{length of centre conductor (cm)} = \frac{5250}{\text{frequency (MHz)}}$$

Note: If the T828 is to be used over a band of frequencies, trim both sections for the centre operating frequency.

Trim the ends of the Teflon coax as shown in Figure 3.2 (dimensions shown in mm).

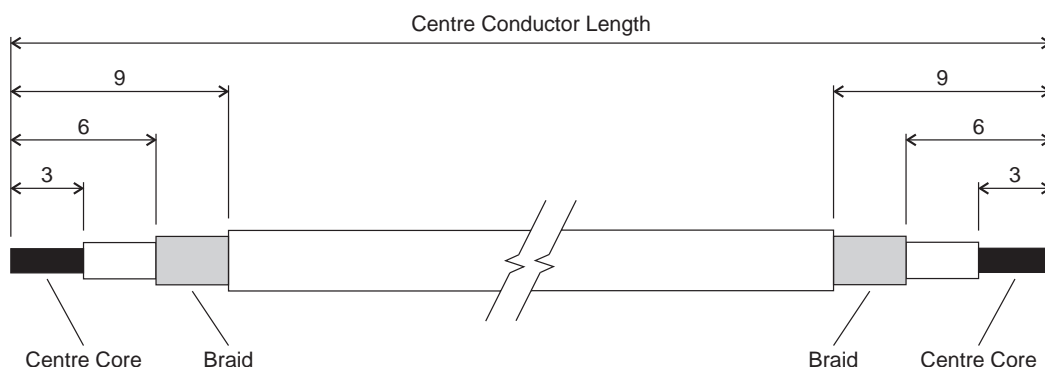


Figure 3.2 Phasing Section Trimming Detail

3.2.2 Fitting

Note: If the Teflon phasing sections have been unbound for trimming, they must be rebound in the same way as the original components.

Remove the wire links fitted in locations TL1 and TL2 (refer to Figure 3.3).

Fit the Teflon phasing sections as shown in Figure 3.3 and solder the terminations as shown in Figure 3.4.

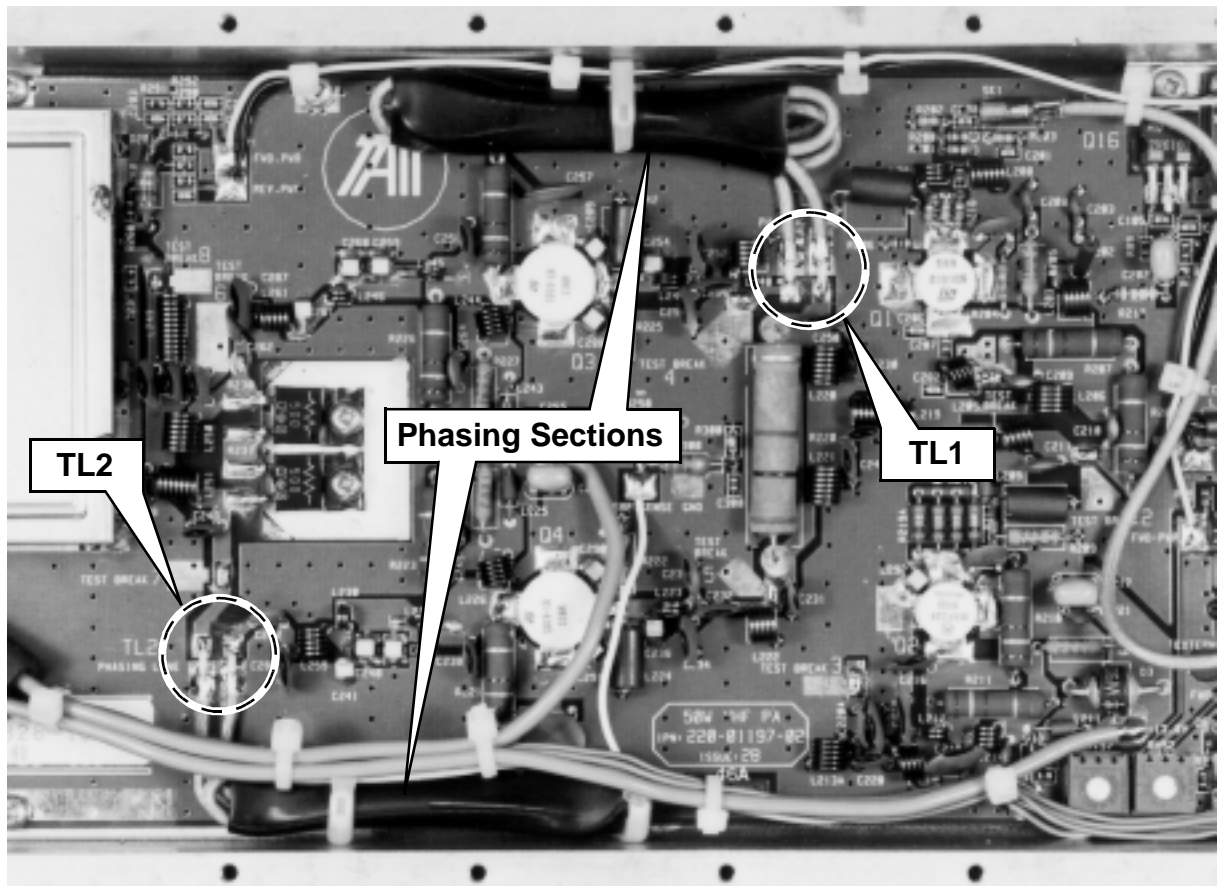


Figure 3.3 Phasing Section Location

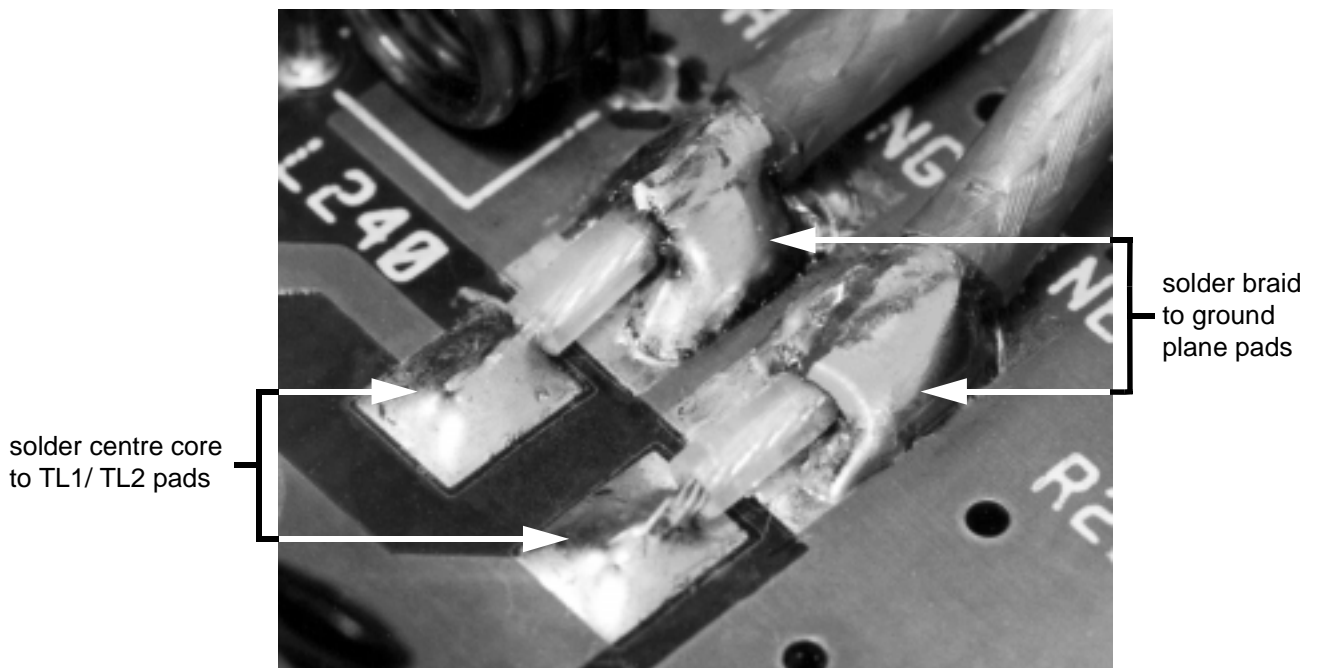


Figure 3.4 Phasing Section Soldering Detail

3.3 Preliminary Checks

Check for short circuits between the positive rail and earth.

Set up the test equipment as in Figure 3.1.

Connect the T828 to a 13.8V DC supply.

Check that the quiescent current is approximately 45mA.

To key the transmitter, earth the key line (pin 13) on the exciter.

Check that the power supply is still at 13.8V under load.

Check that the regulated power control supply is approximately 7V.

Note: The output power and alarm levels should be set with the cover shield on. If the cover is removed for other adjustment procedures, make a final check of the output power and alarm levels with the cover shield on.

3.4 Setting The Output Power



Caution: If the temperature shutdown power level has not yet been set or is unknown, check that the unit does not overheat while setting the output power.

Note 1: Cables and connectors can easily cause a power loss of several watts if either too long or poorly terminated. Always use the shortest possible lead between the T828 and power meter.

Note 2: With the T828 partially withdrawn from the rack frame for tuning, the T006-80 (formerly TA-068) lead is required to connect the T828 to the T827 exciter.

Note 3: The actual power used may be limited by regulatory requirements.

Connect the exciter output to the PA input via a thru-line wattmeter with a 5W full scale reading. Special SMC/BNC leads will be required.

Connect an RF power meter to the PA output. Set the front panel power control preset (RV63) fully clockwise.

Key on the drive source.

Check that the power output exceeds 60W.

Adjust RV63 to reduce the power output to the required level (e.g. 50W).

3.5 Limiting The Maximum Output Power

Refer to the control section circuit diagram in Section 5.

Two chip resistors are provided on the PCB if there is a requirement to limit the maximum output power. These two resistors are normally bypassed by a section of track.

Cut the track as shown in Figure 3.5 to bring R99 & R100 into circuit.

Set the maximum output power by selecting the values of R99 & R100 according to the table on the control section circuit diagram.

Note: The values of R99 & R100 are factory set for 50W maximum output power.

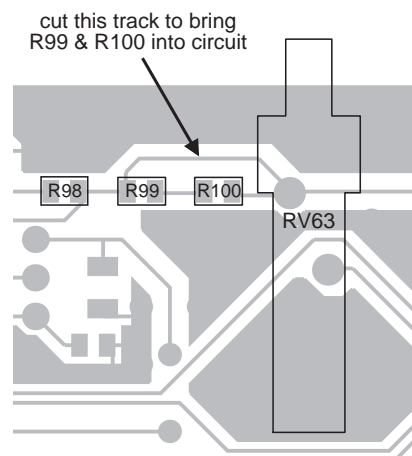


Figure 3.5 Modifications To Limit Maximum Output Power

3.6 Temperature Shutdown

Note: The temperature shutdown circuit is factory set to approximately 130°C and 20W. RV69 and RV74 should not be readjusted if normal operation is required.

Power up the T828 and adjust the power control pot. (RV63) for the normal operating power level.

Turn the temperature set pot. (RV69) fully anticlockwise to avoid RF power cycling between the levels set by RV63 and RV74.

Apply heat to the NTC (R300) with the tip of a soldering iron.

Adjust the shutdown power level pot. (RV74) to the desired level. For continuous operation during fault conditions, set the shutdown power in the range 10 to 20W.

For normal operation, i.e. shutdown under extreme PA internal temperatures (approx. 130°C) or excessive dissipation in the splitter balance resistor (R220), adjust the temperature set pot. (RV69) for a voltage reading of 150mV at TP1 (pin 12 of the LM324D [IC1]).

3.7 Remote Forward Power Meter Calibration

If a remote meter is connected, adjust the forward power meter calibration control (RV43) for the remote reading to agree with the RF power meter reading.

3.8 Remote Reverse Power Meter Calibration

If a remote meter is connected, connect a 50 ohm 3dB pad (with the output open circuit) to the PA output.

Apply RF drive and Tx key.

Adjust the reverse power meter calibration control (RV57) for a quarter of the forward power reading.

3.9 Setting Alarm Levels

Note: If forward and reverse power metering is being used, set up their calibration (Section 3.7 and Section 3.8) before setting the alarm levels.

3.9.1 Forward Power

Power up the T828 and adjust the front panel power control (RV63) so that the output power is at the alarm level required (e.g. 40W if the PA normally operates at 50W).

Adjust the forward power alarm set control (RV48) so that the forward power alarm LED lights.

Check the alarm level setting by adjusting the power up and down and observing the alarm LED. A few watts hysteresis can be expected.

Readjust RV63 for the normal operating level.

Note: Remote indication is available at D-range pin 3.

3.9.2 Reverse Power

Power up the T828 and adjust the front panel power control (RV63) for the normal operating power level.

Place a known mismatch of the required value (e.g. 5:1 VSWR) and adjust the reverse power alarm set control (RV52) so that the reverse power alarm LED lights.

Example: A VSWR of 3:1 can be simulated by connecting an unterminated 3dB pad (100W) to the PA output. This will result in a return loss of 6dB.

Note: Remote indication is available at D-range pin 4.