

3 T838/839 Initial Adjustment



Caution: This equipment contains CMOS devices which are susceptible to damage from static charges. Refer to [Section 1.2](#) in Part A for more information on anti-static procedures when handling these devices.

The following section describes the full adjustment procedure to be carried out before operating the T838/839.

Note: The T838/839 require 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. Refer also to [Figure 3.3](#) which shows the location of the main adjustment controls.

The following topics are covered in this section.

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3.1 Test Equipment Required

- DC power supply capable of delivering 30A at 13.8V.
- Multimeter or DMM (e.g. Fluke 77).
- RF power meter (e.g. HP 435 series or Bird Wattmeter).
- 150W 30dB attenuator.
- 150W 3dB 50 ohm pad.
- 'BNC' to 'N' type adaptors (e.g. Amphenol, Greenpar).
- Appropriate trimming tools.

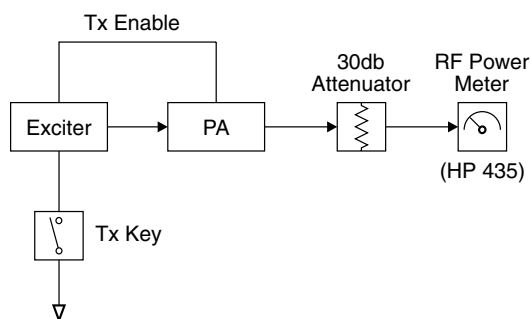


Figure 3.1 T838/839 Test Equipment Set-up



Caution: Do not connect attenuators or DC blocks between the T837 and T838/839 or the cyclic keying circuitry will not function correctly.

3.2 Preliminary Checks

Check for short circuits between the positive rail and earth.

Set up the test equipment as in [Figure 3.1](#).

Connect the T838/839 to a 13.8V DC supply.

Check that the quiescent current is <50mA.

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 side cover on. If the cover is removed for other adjustment procedures, make a final check of the output power and alarm levels with the side cover on.

3.3 Setting The Output Power



Caution: If the high 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: You must set up the T838/839 according to the following instructions *before* operation in a radio system. *Do not* use the factory default settings as they may not suit your operating frequency.

To obtain optimum performance from the T838/839, ensure that the exciter used in this set-up procedure is the one that will be used with the PA in the radio system.

Note 2: Cables and connectors can easily cause a power loss of several watts if either too long or poorly terminated. Always use the shortest possible leads (or connectors instead of leads) between the T838/839 and power meter set-up.

You will need appropriate extension leads if you wish to carry out the adjustment procedures with the T838/839 withdrawn from the rack in the latched position. Alternatively, disconnect and withdraw the T838/839 and reconnect it behind the rack.

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

Set the exciter to the required operating frequency.

Connect the exciter output to the PA input via a thru-line wattmeter with a 1W full scale reading. Special BNC/N leads will be required.

Connect an RF power meter to the PA output connector.

With the exciter *not* keyed:

- remove the label over the adjustment hole for RV115 (driver power clamp);
- set RV115 to maximum (fully clockwise);
- set RV109 (front panel power control) to maximum (fully clockwise).

Key on the exciter.

Quickly (within 30 seconds) adjust RV115 until the output power is:

T838 - 60W
T839 - 120W.

Adjust RV109 to set the power output to the following levels (or less if required):

T838 - 50W
T839 - 100W.



Caution: Do not allow the output power to exceed these levels as this will seriously reduce the reliability of the PA.

Do not use RV115 to set the output power as this will disable the thermal protection circuitry. The power clamp must always be 10W (T838)/20W (T839) above the set output power.

Replace the label over the adjustment hole for RV115.

3.4 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 set an absolute limit to the maximum output power. These two resistors are normally bypassed by a zero Ohm resistor (LINK2).

Remove LINK2 as shown in [Figure 3.2](#) to bring R173 & R174 into circuit.

You can now limit the maximum output power by selecting the appropriate values for R173 & R174. Two examples are given in the table below:

@174MHz	60W max. (T838 & T839)	110W max. (T839 only)
R173	470Ω	470Ω
R174	3k9	1k8

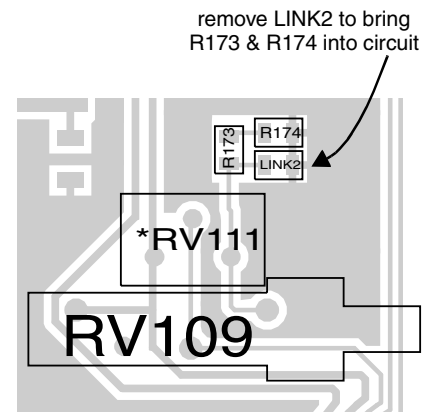


Figure 3.2 Modifications To Limit Maximum Output Power

Note: The resistor values given in the above table are valid at 174MHz only. Different frequencies may require different values, and you will have to determine the correct values for your application by testing. At any given frequency an increase in resistance will result in a decrease in maximum output power.

3.5 High Temperature Shutdown Power Level

Set RV109 (power control) to the required output power.

Earth pin 9 of IC101.

Adjust RV113 (shutdown power level) for an output power of:

T838 -	16W
T839 -	40W.

Remove the earth from pin 9 of IC101.

To check the operation of the RF power module thermistor(s), place shorting links across pins 1 & 2 and 2 & 3 of LINK201.

Check that the output power drops to:

T838 -	16W
T839 -	40W.

Remove the shorting links from LINK201.

3.6 Remote Forward Power Meter Calibration

If a remote meter is connected, adjust the forward power meter calibration control (RV103) for the remote reading to agree with the RF power meter reading.

3.7 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 (RV107) for a quarter of the forward power reading.

3.8 Setting Alarm Levels

Note: If forward and reverse power metering is being used, set up their calibration ([Section 3.6](#) and [Section 3.7](#)) before setting the alarm levels.

3.8.1 Forward Power

Power up the T838/839 and adjust the front panel power control (RV109) so that the output power is at the alarm level required (e.g. 80W if the T839 normally operates at 100W).

Adjust the forward power alarm set control (RV101) 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 RV109 for the normal operating level.

Note: Remote indication is available at pin 3 of D-range 1.

3.8.2 Reverse Power

Power up the T838/839 and adjust the front panel power control (RV109) for the normal operating power level.

Place a known mismatch of the required value (e.g. 3:1 VSWR) and adjust the reverse power alarm set control (RV105) 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 pin 4 of D-range 1.

