

# DU-1500T Antenna Tuner

## User's Manual



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# DU-1500T Antenna Tuner

## FEATURES

The DU 1500T optimizes the performance of your antenna and transmitter or SWL receiver by providing adjustable impedance matching. The DU1500T also measures the Power and Standing Wave Ratio (SWR), which allows you to tune the indicted SWR to the lowest possible ratio for the selected transmit frequency.

## Specifications

### Front Panel Indicators

Meter.....Crossed Needles Power and SWR meter.

### Controls

Input Tuning.....Continuous rotation 4.5 kV capacitor 330 pF

Antenna Tuning.....Continuous rotation 4.5kV capacitor 330 pF

Antenna Switch Selector.....Five position ceramic switch: COAX 1, Tuned and COAX 2 Tuned and BYPASS, COAX 1 DIRECT, COAX 2 DIRECT

Power Range Switch.....Two position: 200 W / 2 kW

**Warning: On 1.8 MHz for an SWR higher than 3:1 Do not exceed 800 W!!**

### Rear Panel Connectors

Coax 1.....SO-239 Teflon connector

Coax 2.....SO-239 Teflon connector

Balanced Line.....Dual high voltage ceramic terminal,  
Includes 4:1 balun

### Other

Frequency Coverage.....1.8 - 30 MHz, continuously tunable

Power Rating .....1500 W CW

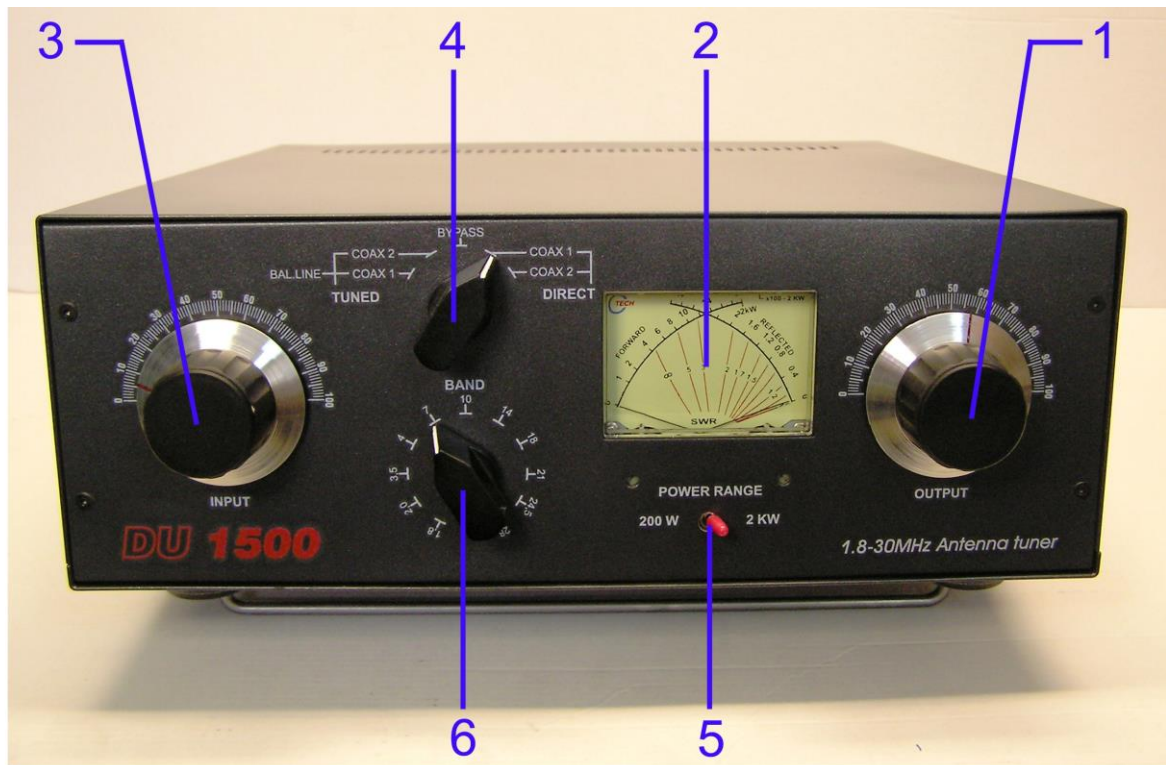
Input impedance.....50  $\Omega$

Output impedance..... 25 - 600  $\Omega$  for coaxial, for single wire 2000  $\Omega$

Dimensions .....H 4.7" (12 cm) W 13" (33 cm) x D 13" (33 cm)

Weight.....10 lb (4.5 kg)

## Controls and Connectors



DU1500T Front Panel

### Front Panel Functions

- 1. Output (Transmitter)**  
Continuously adjustable output capacitor
- 2. Power and SWR Meter**  
  
The dual needle meter displays FORWARD and REFLECTED Power in Watts. The SWR is measured where the two needles intersect on the red curved scales.
- 3. INPUT (Antenna)**  
Continuously adjustable input capacitor.

#### **4. DIRECT-TUNED MODE SWITCH**

Five-position rotary switch an output coaxial connector.

1. TUNED COAX 1 selects the COAX 1 connector through the impedance matching circuit.
2. TUNED COAX 2 selects the COAX 2 connector through the impedance matching circuit.
3. DIRECT BYPASS selects BYPASS COAX connector bypassing the impedance matching circuit but providing SWR, FORWARD, and REFLECTED power meter readings.
4. DIRECT COAX 1 select the COAX 1 connector bypassing the impedance matching circuit but providing SWR, FORWARD, and REFLECTED meter readings.
5. DIRECT COAX 2 selects the COAX 2 connector bypassing the impedance matching circuit but providing SWR, FORWARD, and REFLECTED meter readings.
6. TUNED WIRE/BAL selects the BAL.LINE+COAX 1 connector through the impedance matching circuit.

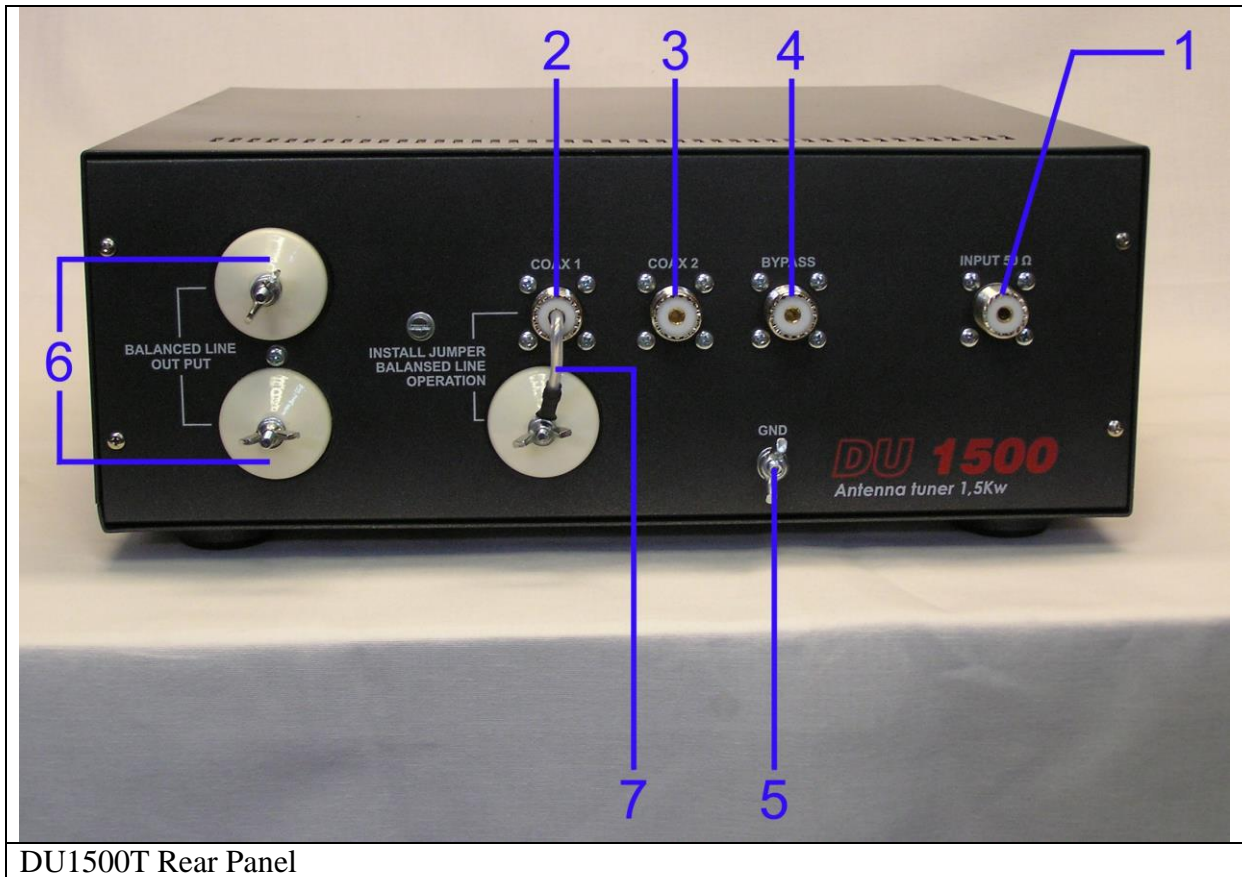
#### **5. POWER RANGE SWITCH**

Two-position switch selects the range (200W or 2kW) of FORWARD and REFLECTED Power displayed on the power meter.

When the METER ( power range) switch is on 200 W the FORWARD meter scale reads 200 W full scale and the REFLECTED meter scale reads 40 W at full scale.

When the METER switch is on 2 kW, the FORWARD meter scale reads 2 kW full scale and the REFLECTED meter scale reads 400 W full scale.

## Rear Panel Connectors



1. RF INPUT - Coaxial connector for input from SWL receiver or transmitter.
2. COAX 1 - Coaxial connector for output to Antenna One.
3. COAX 2 - Coaxial connector for output to Antenna Two.
4. BYPASS - Coaxial connector for output to dummy load or third coax output.
5. GROUND - Post/Wing-nut type ground connector.
6. BALANCED OUTPUT - Two ceramic post for output to RF balanced twin-lead antennas.
7. Install Jumper to use the balanced output.

## Installation

Select a location for the DU 1500T that allows the connectors to be free of any possible contact during operation.

**WARNING: Some balanced or end-fed antennas will produce high RF voltages at the wing nut connector. RF burns may occur if touched during transmission**

1. Connect a coax cable from your transmitter or receiver to the RF INPUT connector on the rear panel. Keep the cable as short as possible. If you use a linear amplifier, connect your transmitter to the linear amplifier output to the DU 1500T.
2. Connect coax cable(s) from your antenna to COAX 1 or COAX 2 connectors on the rear panel. These connectors are either direct from the transmitter or through the tuned circuit depending on the setting of the OUTPUT SELECTOR switch on the front panel.
3. If you are using a balanced feed antenna, connect the INSTALL JUMPER in the COAX 1 connector and switch band switch TUNED COAX 1.
4. If using a single wire antenna, connect it to COAX 1 without installing the jumper.
5. Connect a dummy load to the BYPASS connector using a coax cable. This lets you select the dummy load from the OUTPUT SELECTOR switch. Any antenna that does not require the use of an antenna tuner may be connected to the BYPASS connector, if desired.

## Before Operation

1. To avoid possible damage to the DU 1500T, set INPUT, OUTPUT, BAND SWITCH and POWER RANGE switches as outlined in the next section before applying transmitter power. (Tuning Section)
2. Begin tuning with your transmitter with a low power setting (30 to 50W)

**WARNING: Do not operate the DU1500T with the cover removed!**

## TUNING

1. Select the band and frequency of desired operation.
2. Set INPUT, OUTPUT, and BAND SWITCH controls to the suggested settings before applying transmitter power. Actual settings may vary from antenna to antenna.
3. Set up your transmitter to a low power output. If your transmitter has a TUNE position, select that position.
4. If you use a linear amplifier, set it to STANDBY. Do not use the linear amplifier until the DU 1500T is tuned.

### **WARNING: Do not exceed 1500 W (Single tone or Keydown).**

5. Set POWER RANGE switch to 200W.
6. Set OUTPUT SELECTOR switch to BYPASS, or to the position matching your antenna connection. To tune your antenna, the switch selection must be set to: COAX 1 TUNED COAX 2 TUNED, or BAL.LINE+COAX 1. Selecting COAX 1 DIRECT, COAX 2 DIRECT, or BYPASS.
7. Rotate the INPUT and OUTPUT controls for maximum noise or signal as heard on your receiver.
8. Key your transmitter and adjust the power level for a reading of 50 to 100 watts on the FORWARD scale. Adjust the INPUT and OUTPUT controls for a minimum REFLECTED reading while maintaining a FORWARD reading of 50 to 100 watts using your transmitter power control.
9. Read the SWR on the red scale at the point where the two needles intersect. Repeat step 8 until the lowest SWR reading is obtained. The SWR should be 2:1 or lower.  
NOTE: This procedure takes patience the first time. The INPUT and OUTPUT controls vary the capacitors and provide fine adjustments.

## NOTES

1. An SWR of 1:1 is best, but an SWR as high as 2:1 may be acceptable. Check your transmitter manual for details.
2. If you cannot get an acceptable SWR, lengthen or shorten your antenna and/or check feedlines and retune.
3. If you get low SWR readings at more than one setting, use the setting that:
  - Gives the highest FORWARD power reading.
  - Gives the lowest REFLECTED power reading.
  - Uses the largest capacitance (highest number) on the TRANSMITTER and ANTENNA controls.
  - Uses the least amount of inductance
4. Any time a new or different antenna is connected, it is necessary to repeat the tuning procedure for each antenna.