Operating Manual Super Tuner Plus





DenTron 160-10 Super Tuner Plus 1 kw

Introduction

The Super Tuner Plus is everything the famous DenTron Super Tuner is, and more! The Plus includes a front panel forward relative power meter, and a built-in front panel antenna switch that handles up to four antennas.

When properly adjusted, the Super Tuner Plus will tune out load reactance and transform the load impedance to 50-70 ohms. A heavy duty 2 core balun is included, so antennas fed with open wire (balanced) feedline may be properly tuned to the desired operating frequency.

Single wire, balanced feed, and coax cable fed antenna systems can be used with the Super Tuner Plus, although everything from bedsprings to raingutters and downspouts have been successfully used by DenTron tuner owners. The unit allows front panel switching of your antennas, plus tuner bypass. Another antenna selector switch position allows for permanent installation of a dummy load, such as the DenTron Big Dummy, and when used with a VSWR meter lacking dual metering, you can measure both forward and reflected power at the same time.

Power handling capability of the Super Tuner Plus is 1 KW CW and 1200 Watts PEP SSB (both measured in DC input to the final amplifier). The unit is compact but rugged, in an all-metal tightly shielded cabinet and weighs in at less than 15 pounds.

Theory of Operation

When one installs an antenna system of any type, a complex load may exist at the input end of the feed line. Depending on the frequency in use and the feedline length, this load can be a very high or very low impedance, or somewhere in between. The DenTron Super Tuner Plus is designed to match these wide variations to your normal 50 ohm transmitter/receiver impedance, and thus give you maximum efficiency in both transmit and receive modes.

It is important to remember that nothing will compensate for coaxial feed line loss when it is terminated with something other than its normal impedance. In other words, a severe mismatch at the antenna end of a 50 ohm feedline can be tuned out at the other end of the line, but you still have some degree of loss in the coax, and if it is high enough, the results can be inefficiency in both the transmit and receive functions. The Super Tuner Plus, however, will overcome any ill effect on your transmitting/receiving equipment, since it will see the nominal 50 ohm load offered by the tuner.

Remember, the closer your antenna system is to a fundamental or harmonic resonance, the better it will perform. The Super Tuner Plus gives you that big degree of flexibility required to put all of your power where it does the most good.

Unpacking Instructions

Carefully remove your Super Tuner Plus from its packing carton, making sure there is no damage evident from shipping. If there is any damage, notify the delivering shipper immediately, fully describing the damage.

Fully complete the DenTron Registration card included in the information package and return it to DenTron. Do not destroy the packing material, since it will be usable later on should you require factory service or need to transport the tuner for any other reason.

Installation

1. Connect a good earth ground to the <u>ground terminal</u> on the tuner's rear panel. A ground stake or rod is preferred, but a short, heavy wire clamped to a cold water pipe will usually suffice, if all connections are clean. It is most important to make your ground lead of the heaviest wire available and to use the short-est length possible between the ground point and tuner. Be sure to run an extension of the ground lead from your tuner to all other station equipment, especially your transmitter and linear amplifier.

SEE BILL ORR'S HANDBOOK FOR MORE INFORMATION ON EARTH GROUNDING.

- Connect your antennas to the appropriate output terminals on the rear panel.
 <u>Bal. Out</u> for balanced (or ladder) line feed.
 <u>Coax Out</u> for 50 or 70 ohm coax cable.
 <u>Wire Out</u> for long wire or random length antennas
 <u>Alt. Out</u> for secondary coaxial antenna or dummy load, such as the DenTron Big Dummy. This position is <u>not</u> tuneable.
- 3. Connect, if available, an SWR Bridge or Wattmeter (such as the DenTron W-2) between your exciter output and the tuner input connector on the rear panel, using quality 50 ohm coaxial cable. Be certain, in all cases, to solder the coax cable shield to the connector in making interconnecting or antenna lead-in cables. See Diagram 1.

SUPER TUNER PLUS IN BASIC SYSTEM



DIAGRAM 1

Operation

1. Set tuner controls as follows:

A. For 50 ohm settings see Chart A.

BASIC CONTROL SETTINGS (into a 50 ohm resistive load)

BAND & FREQ.	TRANS.	INDUCTANCE	ANT.
160 - 1.830	1	L	2.5
75 - 3.8	3	Ε	4.0
40 - 7.2	5.5	С	6.0
20 - 14.2	4	В	1.0
15 - 21.3	3.5	В	3.0
10 - 28.6	8.25	A	8.0
	CHART	A	

B. For an unknown antenna system:

160-40 meters - Transmitter and Antenna controls at 5 on respective scales. Inductance Selector to position A.

20-10 meters - Transmitter and Antenna controls at 6 on respective scales. Inductance Selector to position A.

- 2. Turn the front panel sensitivity control fully clockwise.
- 3. Key your exciter and apply just enough RF power to cause a reading on the relative power meter and/ or an SWR bridge-wattmeter.

Caution

Keep your exciter power output level as low as possible until you have reached an optimum match. Increase power gradually, readjusting the tuner with each step up in power.

- 4. Next, rotate the inductance selector for a minimum reading on the station VSWR meter, and/or a maximum reading on the front panel relative power output meter. Be sure to adjust the front panel sensitivity control as necessary.
- 5. Next tune the antenna matching and then the transmitter matching controls for minimum reading on the VSWR meter and/or a maximum reading on the front panel relative power output meter.
- Remember that all three front panel tuning controls interact with each other, so readjust each one until you have reached an absolute minimum reading on your VSWR meter, and/or a maximum reading on the front panel relative power meter.

- 7. Apply full drive to your final amplifier and set the relative power meter to read full scale.
- 8. Unkey the exciter and set it to operate in the SSB mode. Your modulation can now be set correctly by observing the relative power meter. It should never go beyond 75% of full scale, or you will probably be flat topping, etc.
- 9. Once you've tuned up, make a record of each tuner setting per band. That will make for quick band changing.
- 10. After your VSWR meter is tuned to the lowest possible point leave your SWR bridge/power meter in the reflected position, and use the relative power output meter on the tuner to observe forward power.

Super Tuner Plus Parts List

CAPACITORS:	
C1	500 Pf Variable
C2	500 Pf Variable
C3	Sensing Network
C4	.01 Disc. 1 KV
RESISTORS:	
R1	1K, ½W Carbon
R2	100K Pot
INDUCTORS:	
L1	Tapped Inductor
T1	4:1 Balun XFMR.
SWITCHES:	
SW1 A&B	5 Pos. DP ceramic SW.
SW2	12 Pos. SP ceramic SW.
CONNECTORS:	
J1, J2, J3	SO 239's
J4, J5, J6	Ceramic Feed thrus
MISC.:	
D1	1N6263
M1	0-1 MA MTR.



Limited Warranty

DenTron Radio is proud of the quality and workmanship of its communication equipment. If properly installed and operated in accordance with our instruction manual, it will give reliable performance. DenTron Radio extends to you as an owner of a new DenTron Radio Product the warranty set forth below:

For ninety (90) days from the date of original retail purchase, DENTRON RADIO CO. will either repair or replace, at its option, free of charge, any part or parts found to be defective in material or workmanship. Transportation charges for any parts submitted for replacement under this warranty must be paid by the purchaser.

This warranty will not apply to any part which has become inoperative due to misuse, excessive use, accident, neglect, improper maintenance, alterations, or unless the unit has been operated and maintained in accordance with the instructions furnished.

This warranty will not apply where the unit has been used commercially or when the unit has been used in conjunction with accessories not manufactured by DENTRON RADIO CO.

All implied warranties are limited in duration to ninety (90) days from the date of original retail purchase.

The provisions of this warranty specifically exclude any warranty or remedies for incidental or consequential damages.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

In order to obtain warranty service, send written notification to the following address: DENTRON RADIO CO., Attn: Service Dept., 2100 Enterprise Parkway, Twinsburg, Ohio 44087.

Any written notification should include the model number of the unit, date and place of purchase, and a description of the defective part or condition. Do not return the unit or any parts unless requested to do so by DENTRON RADIO CO.

Although the return of the DENTRON Warranty Registration Card is not a condition precedent to warranty coverage and performance, the purchaser is encouraged to promptly return the Warranty Registration Card upon purchase in order to more easily facilitate the handling of any future service under these warranty provisions.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.



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