

Operating Manual

AT-1K Tuner

Dentron

DenTron AT-1K Antenna Tuner

1 kw

Introduction

The AT-1K is everything DenTron Tuners are famous for and more! The AT-1K includes a front panel SWR and relative power meter, and a built-in front panel antenna switch that handles up to four antennas.

When properly adjusted, the AT-1K will tune out load reactance and transform the load impedance to 50-70 ohms. A heavy duty 2 core balun is optional, 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 AT-1K, although everything from bedsprings to rain gutters 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.

Power handling capability of the AT-1K 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 7 pounds.

Specifications:

Power Handling Capabilities:	1200 w PEP Input 1 KW CW Input
Metering:	Relative forward power standing wave ratio.
Antenna Switching:	Alternate coax bypass coax tune single wire balanced feed with optional balun
Dimensions:	H 3¾" W 10" Dep. 9½" Weight: 7 lbs.

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 AT-1K is designed to match these 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 AT-1K, 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 AT-1K 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 AT-1K 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 **ground terminal** 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 shortest 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 ARRL HANDBOOK FOR MORE INFORMATION ON EARTH GROUNDING.

2. Connect your antennas to the appropriate output terminals on the rear panel.

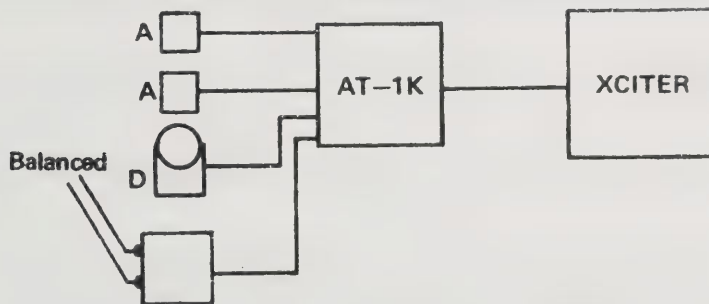
Bal. Out for balanced (or ladder) line feed.

Coax Out for 50 to 70 ohm coax cable.

Wire Out for long wire or random length antennas.

Alt. Out for secondary coaxial antenna or dummy load, such as the DenTron Big Dummy.

AT-1K IN BASIC SYSTEM



CAUTION

In following steps 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.

Operation

1. Set tuner controls as follows:

A. For 50 ohm settings see Chart A.

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	E	4.0
40 - 7.2	5.5	C	6.0
20 - 14.2	4	B	1.0
15 - 21.3	3.5	B	3.0
10 - 28.6	8.25	A	8.0

B. For an unknown antenna system:

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

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 SWR meter.

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 VSWR meter, reading on the front panel relative power SWR output meter.
5. Next tune the antenna matching and then the transmitter matching controls for minimum reading on the VSWR meter.
6. 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 the VSWR meter.
7. Once you've tuned up, make a record of each tuner setting per band. That will make for quick tuning changing.
8. Apply full drive to your final amplifier, push in the set/SWR sensitivity control and set the relative power/SWR meter to the set line on the scale. When released, the meter will automatically calculate the SWR.
9. For SSB modulation adjustment, push in the set/SWR control and observe the meter during conversation. The meter should never go beyond 75% of full scale. If it does, adjust the audio gain control on your exciter accordingly.

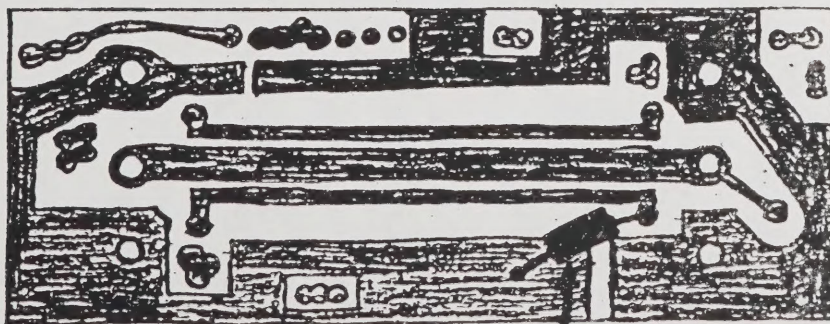
C1	500 Pf Variable
C2	500 Pf Variable
L1	Tapped Inductor
SW1 A&B	5 Pos. DP ceramic SW.
Ind. Sw.	12 Pos. SP ceramic SW.



NOTICE

IF YOU PLAN TO USE YOUR AT-1K TUNER AT LOW POWER AT ALL TIMES (100 WATTS OR LESS) REPLACE THE EXISTING R RESISTOR WITH THE SUPPLIED 1K. SEE DRAWING BELOW FOR LOCATION.

IF YOU USE 100 WATT OR MORE LEAVE THE ORIGINAL RESISTOR (130 ohm) IN THE AT-1K. WITH THE ORIGINAL RESISTOR, THE SENSITIVITY OF THE SWR METER WILL BE SLIGHTLY LOWER AT LOW POWER.



130 ohm RESISTOR