

# AMERITRON ATR-8, ATR-8B

## ANTENNA TUNER

### INSTRUCTION MANUAL



The ATR-8 is a compact, medium power, antenna tuner that covers 1.6 - 30 MHz in six overlapping ranges. Optimum efficiency in a small case size is obtained by using teflon insulated wire on an air core form for 3.5 - 30 MHz and a large toroid core for the 1.6 - 2.5 MHz position. An optional ground independent balun isolates the two balanced terminals on the rear panel from ground insuring a balanced current flow into any feedline. Impedance matching takes place in a "T" network that uses two variable capacitors and a switched inductor. This network will match an antenna of 15 to 1000 ohms impedance to the 50 ohm output of a transmitter or transceiver. Power handling is determined by the "Q" of the network and the voltage rating of the 1000 volt capacitor. The built in SWR bridge will provide indication of maximum power reflected in the "SWR" position and is useful down to a few watts of exciter power.



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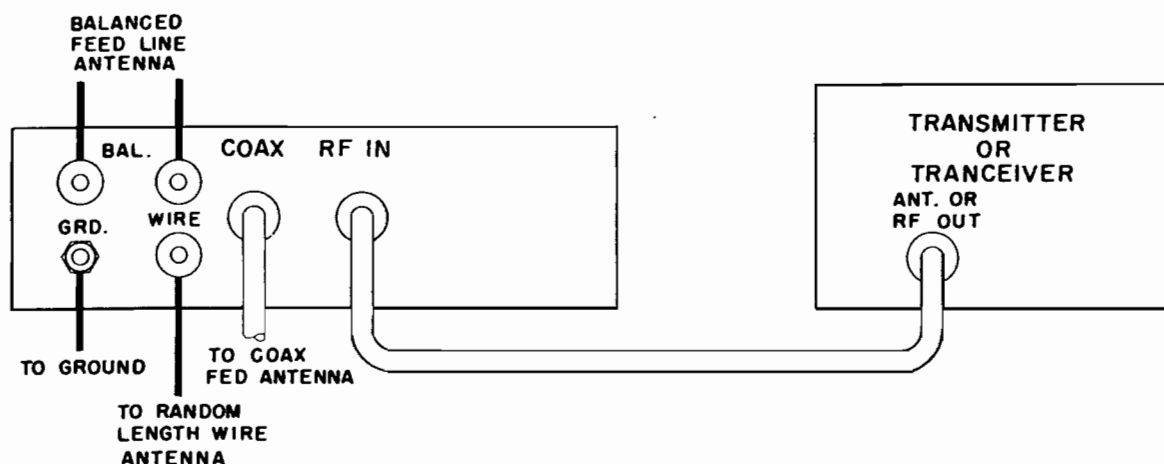
# Theory Of Operation

The "Q" of a C-L-C "T" network increases as the value of "L" increases. This means that for maximum power handling capabilities a minimal value of inductance and "Q" (highest alphabetical setting on "IND" control) should be selected. Some impedances may fall outside the range of the network and a higher "Q" will be required to extend the network range. This is accomplished by switching the "IND" inductance selector to the next

highest inductance value (lower alphabetical setting).

The ATR-8 will handle 300 watts of power at a 50 ohm nominal impedance above 3 MHz. The power handling capability on 160 meters is 175 watts. This "derating" is necessary because of the high operating "Q" of the network on 160 meters.

## Installation



Locate the tuner at a convenient operating position. Use 50 ohm cable of known good quality between the tuner and the transceiver.

Connect the transmitter or transceiver to the "RF IN" socket on the back panel with any convenient length of 50 ohm coaxial cable. Connect the antenna system to either the "COAX" socket, the "WIRE" terminal, or the "BAL" terminal as required.

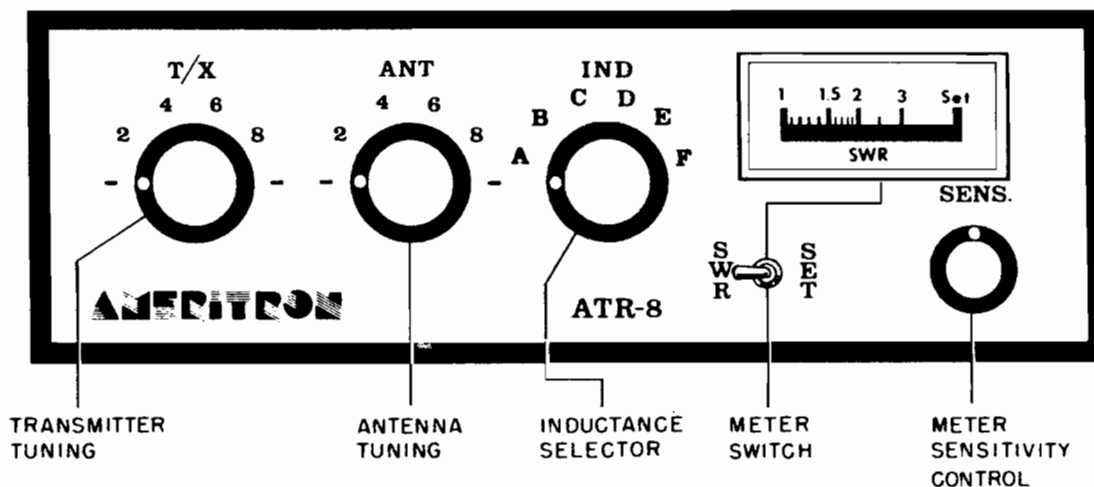
Connect the "GND" post on the back panel to a good earth ground or to the station ground buss. Make this connection as short as possible and use a heavy gauge solid wire. Grounding is very important with all types of antenna systems. The ARRL Antenna Handbook is an excellent source of information on antenna systems and how they function.

## Transmitter Adjustment

Broad band transmitters require no advance preparation. Transmitters with networks that require tuning should be adjusted on a dummy load prior

to use with the ATR-8. The control settings can be noted for future reference.

# Operation



1. Pre-set the ATR-8 to the settings shown in the tuning chart for the desired band (see page 3).
2. Set the "SENS" control to the full clockwise position, place the "SWR/SET" switch in the "SET" position.
3. Adjust the output level of the transmitter until full scale deflection occurs on the "SWR" meter. A power level of less than 10 watts will supply a full scale reading.
4. Place the "SWR/SET" switch in the "SWR" position and adjust the "T/X" knob carefully for the lowest "SWR" meter reading. Alternately adjust the "T/X" and "ANT" controls until the lowest "SWR" reading is obtained.

5. Gradually increase the transmitter power and re-adjust the "T/X" and "ANT" controls for the lowest "SWR" reading until full output is reached (do not exceed the power rating of the ATR-8).

6. In the event that the antenna impedance is extremely high or low the next lowest setting of the "IND" selector (counter-clockwise) may bring the network into range. Remember these extreme loading conditions may lower the power handling abilities of the ATR-8. If any arcing is heard immediately reduce the power level of the transmitter.

When the ATR-8 is used for receiving simply adjust the "T/X", "ANT" and "IND" controls for maximum receive signal.

## IMPORTANT

As the "IND" selector is rotated clockwise the network "Q" and the matching range will decrease, and the power handling will increase on overlapping bands. It is best to operate the tuner in the most clockwise "IND" position that permits proper loading.

## TUNING CHART

Freq. MHz	T/X	ANT	IND
1.85	3	5	A
2.0	4	6	A
2.5	7	7	A
3.6	2	4	B
3.8	3	5	B
4.0	4	6	B
5.0	7	8	B
6.0	8	9	B
7.0	4	4	C
7.3	4.5	4.5	C
9.0	7	7	C
10	8	8	C
11	2	1	D
12	4	3	D
13	5	4	D

Freq. MHz	T/X	ANT	IND
14	6	6	D
15	7	7	D
16	8	8	D
17	7	7	E
18	7.5	7.5	E
19	8	8	E
20	8.5	8.5	E
21	9	9	E
22	9	9	E
23	8	8	F
26	8.2	8.2	F
28	9	9	F
29	9.2	9.2	F
30	9.5	9.5	F

## PARTS LIST

C1,2	AR-116	208pf., 1000 volt variable	L 2	FP-132	L.F. coil
C 3	AR-404	27pf., 500 volt SM	M 1	AR-349	200 Ua meter
C 4	AR-440	470pf., 500 volt SM	R 1	AR-402	47 ohm, 1/2 watt res.
C 5	AR-166	427 trimmer cap.	R 2,3,4	AR-384	180 ohm, 1/4 watt res.
C6,7	AR-416	.01mfd., 50 volt discap	R 5	AR-436	100K ohm variable res.
D 1, 2	AR-346	1N34 diode or equiv.	S 1	AR-233	SPDT switch
L 1	FP-133	H.F. coil	S 2	AR-362	SP6T rotary switch

## SCHEMATIC

