

# ET-1

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## Econo-Tuner™ Owner's Manual



# FOREWORD

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Congratulations on choosing the Advanced Electronic Applications ET-1 Econo-Tuner™ to enhance your station's performance.

The ET-1 is an affordable antenna tuner developed by AEA for the economy-minded customer who wants a quality unit.

To fully enjoy the benefits of the ET-1 Econo-Tuner™, please read this owner's manual thoroughly before operating the unit. If you have any questions, I encourage you to contact an AEA authorized dealer or one of our technical service representatives at:

Advanced Electronic Applications, Inc.  
P.O. Box 2160  
Lynnwood, WA 98035-0818  
(206)775-7373/8 a.m. to 4:30 p.m. Pacific time  
FAX (206)775-2340  
TELEX 6972495 AEA INTL UW

73.

C. Mike Lamb N7ML  
President  
Advanced Electronic Applications

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# 1. FEATURES

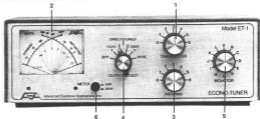
The ET-1 Econo-Tuner™ optimizes the performance of your antenna and transmitter or SWL receiver by providing adjustable impedance matching. The ET-1 also measures the power and Voltage Standing Wave Ratio (VSWR or SWR) which allows you to tune the SWR to the lowest ratio possible for the selected transmission frequency. The ET-1 also features a precision-frequency compensated dual-movement SWR meter.

## 2. SPECIFICATIONS

FRONT PANEL INDICATORS AND CONTROLS	
Meter	Dual-movement D'Arsonval cross needle power and SWR meter
<b>CONTROLS</b>	
Transmitter Tuning	Continuous rotation capacitor
Antenna Tuning	Continuous rotation capacitor
Inductance	12 position switched inductor
Antenna Selector	6 position: Coax 1 tuned and tuner bypass, coax 2 tuned and tuner bypass, bypass and balanced antenna
Power Switch	2 position 30W/300W
<b>REAR PANEL CONNECTORS</b>	
Antenna 1	SO239 connector
Antenna 2	SO239 connector
Bypass	SO239 connector
Transmitter Input	SO239 connector
Balanced Output	Dual banana jack
End-Fed Wire	Banana jack
<b>OTHER</b>	
Frequency Coverage	1.8-30 MHz
Power Maximum	300 W continuous
Dimensions	3.5"H x 10.2"W x 9.4"D
Weight	3.4 lbs.

## 3. CONTROLS/CONNECTORS

### FRONT PANEL CONTROLS



- 1. TRANSMITTER**  
Continuously adjustable input capacitor.
- 2. POWER/SWR METER**  
Dual-needle meter displays FORWARD and REFLECTED power in watts. SWR is measured where the two needles intersect on the red scale.
- 3. ANTENNA**  
Continuously adjustable output capacitor.
- 4. ANTENNA SELECTOR**  
Six-position rotary switch selects an output coaxial connector.  
BYPASS COAX selects BYPASS COAX connector bypassing the impedance matching circuit but providing SWR, FORWARD and REFLECTED power meter readings.  
DIRECT COAX 1 selects COAX 1 connector bypassing the impedance matching circuit but providing SWR, FORWARD and REFLECTED power meter readings.  
DIRECT COAX 2 selects COAX 2 connector bypassing the impedance matching circuit but providing SWR, FORWARD and REFLECTED power meter readings.  
TUNED COAX 2 selects COAX 2 connector through the impedance matching circuit.  
TUNED COAX 1 selects COAX 1 connector through the impedance matching circuit.  
TUNED WIRE selects the END FED WIRE connector through the impedance matching circuit. For balanced antennas, the wire antenna jack is externally connected to the balanced line.
- 5. INDUCTOR**  
12-position rotary switch to vary inductance.

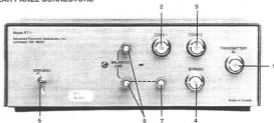
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6. POWER RANGE SWITCH

Two-position switch selects the range of FORWARD and REFLECTED power displayed on the power meter.

When the METER button is out, the FORWARD meter scale reads 300 watts full scale and the REFLECTED meter scale reads 60 watts full scale. When the METER button is in, the FORWARD meter scale reads 30 watts full scale and the REFLECTED meter scale reads six watts full scale.

## REAR PANEL CONNECTORS



1. **TRANSMITTER IN**  
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. Bypasses tuner, but meter circuits remain active.
5. **GROUND**  
Post/wing-nut type ground connector.
6. **BALANCED OUTPUT**  
Two banana jack connectors for output to RF balanced twin-lead antennas. (Note that jumper must be used as shown by the dotted line.)
7. **END FED WIRE**  
Banana jack for output to a single-wire antenna. (Do not use jumper.)

## 4. INSTALLATION

Carefully unpack your ET-1 from the packing carton and inspect it for signs of damage. If any damage is apparent, notify the transportation carrier or dealer immediately. We recommend keeping the packing carton for moving, storing or reshipping the tuner.

Unpacking

Select a location for the ET-1 that allows the connectors to be free from any possible contact during operation.

Location Selection

**WARNING: SOME BALANCED OR END-FED ANTENNAS WILL PRODUCE HIGH RF VOLTAGES AT THE BANANA CONNECTORS. RF BURNS MAY RESULT IF TOUCHED DURING TRANSMISSION.**

1. Connect a coax cable from your transmitter or receiver to the TRANSMITTER 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 input and the linear amplifier output to the ET-1. Do not use more than 300 watts through the tuner.
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.
3. If you are using a balanced feed antenna, connect a balanced line to the BALANCED OUTPUT connectors and jumper banana jack (8) with lower jack (7) as shown by dotted line.
4. If using a single wire antenna, connect it to jack (7) without installing jumper.
5. Connect a dummy load to the BYPASS (4) 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.

Installation Procedures

1. To avoid possible damage to the ET-1 Econo-Tuner™, set TRANSMITTER, ANTENNA and POWER RANGE switches as outlined in the next section before applying transmitter power.
2. Begin tuning with your transmitter set at a low output power setting (10 to 20 W).

Before Operating

### WARNING!

- DO NOT OPERATE THE ET-1 WITH THE COVER OFF.
- DO NOT CHANGE INDUCTOR SWITCH WITH MORE THAN 30 WATTS OF APPLIED POWER.

## 5. TUNING

1. Select the band and frequency of desired operation.
2. Set TRANSMITTER, ANTENNA and INDUCTOR controls to the suggested settings before applying transmitter power. Actual settings may vary from antenna to antenna.

BAND/FREQUENCY	TRANSMITTER		ANTENNA		INDUCTOR	
	Sug.	Actual	Sug.	Actual	Sug.	Actual
160M/1.8 MHz	5		5		L	
75M/3.75 MHz	3		3		H	
40M/7.15 MHz	3		3		E	
30M/10.125 MHz	3		3		C	
20M/14.175 MHz	2		2		B	
17M/18.118 MHz	3		3		A	
15M/21.225 MHz	4		4		A	
12M/24.940 MHz	5		5		A	
10M/28.850 MHz	4		5		A	

3. Set 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 ET-1 is tuned. Do not exceed 300 watts!
5. Set POWER RANGE switch in to 30 W LOW (with meter button depressed).
6. Set OUTPUT SELECTOR switch to BYPASS or the position matching your antenna connection. To tune your antenna, the switch selection must be set to: COAX 1 TUNED, COAX 2 TUNED or WIRE (BALANCED ANTENNA). Selecting COAX 1 DIRECT, COAX 2 DIRECT OR BYPASS bypasses the tuning section.
7. Rotate the TRANSMITTER, ANTENNA and INDUCTOR controls for maximum noise or signal as heard on your receiver.
8. Key your transmitter and adjust the power level for a reading of 10 watts on the FORWARD scale. Adjust the TRANSMITTER, ANTENNA and INDUCTOR controls for a minimum REFLECTED reading while maintaining a FORWARD reading of 10 watts using your transmitter power control.
9. Read the SWR on the red scale at the point where the two needles intersect. Repeat step nine until the lowest SWR reading is obtained. The SWR should be 2:1 or lower.

**NOTE:** THIS PROCEDURE TAKES PATIENCE THE FIRST TIME. THE TRANSMITTER AND ANTENNA CONTROLS VARY THE CAPACITORS AND PROVIDE FINE ADJUSTMENTS. THE INDUCTOR CONTROL PROVIDES COARSE ADJUSTMENT.

10. When you have tuned your antenna to the best SWR, record the settings of the TRANSMITTER, ANTENNA and INDUCTANCE controls on the chart above for future reference. When you return, use these settings as your starting point.

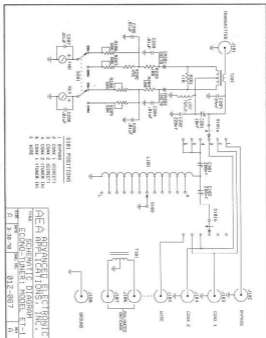


## 6. NOTES

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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 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.
  - The lowest REFLECTED power reading.Uses the largest capacitance (highest number) on the TRANSMITTER and ANTENNA controls.
4. Any time a new or different antenna is connected, it is necessary to repeat the tuning procedure for each antenna.

# 7. SCHEMATIC DIAGRAM



# 8. WARRANTY

## LIMITED WARRANTY

ADVANCED ELECTRONIC APPLICATIONS, INC. warrants to the original purchaser that this product shall be free from defects in material or workmanship for ninety days from the date of original purchase. In order to obtain warranty service: (1) Complete and mail the warranty registration card within 10 days to Advanced Electronic Application, Inc., and (2) Send written notification to the address below or telephone as soon as possible after discovering a possible defect:

Advanced Electronic Applications, Inc.  
Attention: Technical Support  
2005 - 198th S.W.  
Lynnwood, WA 98036  
(206) 775-7373

The written notification must include a copy of the invoice. Include a description of the defect part or condition, with details of the electrical connections to associated equipment and list such equipment. Please enclose your name, phone number, and address. Shipping charges for any parts or units submitted for replacement under this warranty must be paid by the purchaser.

Correct maintenance, repair and use are important to insure proper performance from this product. Carefully read the Instruction Manual. This warranty does not apply to any defect AEA determines is caused by (1) improper maintenance or repair, including the installation of parts or accessories that do not conform to the quality and specification of the original parts; (2) misuse, abuse, neglect, or improper installation; (3) accidental or intentional damage. The field installation of circuits or batteries according to the instructions in the manual will not nullify this warranty.

All implied warranties, if any, terminate ninety days from the date of original purchase. AEA is not responsible for damage to other equipment or property or any other consequential or incidental damage of any kind whether based on contract, negligence, or strict liability. Maximum liability shall not, in any case, exceed the purchase price of the unit.

The foregoing constitutes AEA's entire obligation with respect to this product. The original purchaser and any user or owner shall have no other remedy and no claim for incidental or consequential damages. Some states do not allow limitations of how long an implied warranty lasts or do not allow the exclusion of incidental or consequential damages, therefore, the above limitations and exclusions may not apply to you.

This warranty gives specific legal rights. You may also have other rights which vary from state to state.



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*All stated specifications are approximate and subject to change.*

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