

LPB

ATU-20

Manual

LPB Communications
311 Spruce Street
Camden, NJ 08103

LPB Communications, Inc.

ATU-20 Antenna Tuning Unit

Introduction

The ATU-20 Antenna Tuning unit is a matching device with impedance compensation and reactance cancellation capability, along with a high pass filter.

A cascaded impedance correction system uses two high permeability ferrite coils (T2 and T3) to provide three and five impedance taps for a total of 15 ranges which are selected through two switches (S5 and S6). Each reactance cancellation is accomplished by selecting combinations of high voltage mica capacitors (C3 through C10) which are switched in series with the RF output by two decade-type switches (S3 and S4). Finally, capacitors (C11, C12 and C13) block the 60 cycle energy from entering the coupler (when used for carrier current applications) and fuses (F1, F2 and F3) protect the line in case of capacitor failure.

The “Match-Operate” switch (S1) activates the bridge circuitry and, through a transformer (T1) which lowers the bridge driving impedance, dummy loads 90% of the RF input power for protection during setup. The “Forward-Reverse” switch (S2) enables the DC milli-ammeter to look at reflected or forward power through the bridge, so that SWR can be optimized by selecting the proper cancellation components. The calibration pot (R8) enables calculation of actual SWR by setting a forward power reading reference point.

Installation and Operating Instructions

ATU performance and radio reception are highly dependent on proper system design and proper pre-installation tests.

1. Connect RF and AC cables as described on the following pages.
2. Place S1 in Match position
3. Place S2 in Forward (FWD) position. Meter should indicate full scale. If not, adjust R8 to achieve full-scale reading.
4. Place S2 in reflect (REF) position.
5. Set S3, S4, S5, and S0 for minimum meter reading. A patient, systematic approach must be taken to test all possible combinations of impedance compensation and capacitance cancellation to achieve the lowest meter reading.

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6. Determine the SWR. Set S2 in forward (FWD)

Adjust R8 for full scale (1.0)

Set S2 in reflect (REF), note reading and calculate.

$$\frac{1.0 + \text{reading}}{1.0 - \text{reading}} = \text{SWR}$$

1.0- reading

For example, if reading is 0.2:

$$\frac{1.0 + 0.2}{1.0 - 0.2}$$

=1.5, so the SWR is 1.5:1

NOTE: The meter reading in REF must be approx.. 0.3 or lower (2: 1 or better SWR) for proper transmitter operation.

7. Set S1 to Operate
8. Reduce transmitter RF power to the minimum necessary for desired area coverage.

Broadcasting

The ATU-20 Antenna Tuning Unit is specifically designed to compensate for the inefficiencies of antennas, and to provide an acceptable transmitter to antenna match. Specifically, the ATU functions to:

1. Isolate the transmitter from voltage through the use of high pass capacitors and fuses.
2. Compensate for antenna impedance mismatch through the use of multi-tap toroidal transformers.
3. Compensate for antenna reactance through the use of a decade system of capacitor combinations.

An internal VSWR metering system indicates when the proper combination of corrective settings has been selected for optimum signal transfer.

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The ATU-20 is used for antenna applications as a lightning arrestor and to correct impedance mismatches. Most center-loaded antennas have an impedance less than 50 ohms, so the ATU-20 functions perfectly to match the transmitter's 50 ohm output to the antenna's input.

Specifications

Power Input	20	Watts	RMS	maximum
Input Impedance	50 ohms unbalanced			
Output Impedance	into 50 ohms in 15 range switch built-in capacitance decades			
Matching Circuit	Two staged, multifilar wound ferrite transformers			
Metering	VSWR	bridge,	forward	and reflected readings
AC Line Connection	500Y	maximum,	line	to line and ground
Size	12	"	H, 11"	W, 6.5" D
Weight	7.5 lbs			

WARRANTY

LPB Communications, Inc., warrants this equipment to be free from defects in materials and workmanship for a period of one (1) year after purchase.

This warranty extends to first users of the product and future owners who purchase the product within the warranty period.

The terms of this warranty are null and void if this product is stored or operated in an environment not conducive to electronic equipment, or shows signs of misuse or modifications which affect the proper functioning of the product. This warranty does not apply to damage caused by fire, smoke, flood, lightning, or acts of nature and physical abuse.

LPB Communications, Inc., and its associated companies, authorized distributors, and personnel are not liable for loss of revenues or other damages, or effects to the broadcast signal quality or coverage which may result from the from the improper functioning of this product.

Repair Policy

Technical assistance is available at anytime, at no charge, by phone or correspondence.

During the warranty period, there will be no charge for parts or service made to units which show no sign of misuse by customer or lightning caused damage. The customer is responsible for the cost of shipping their unit back to LPB Communications for repair.

During the warranty period, shipment of small parts and assemblies will be made at no charge to the user. Emergency, next day shipments of replacement parts and circuits will also be made at no charge at the user's request. Chargeable services will be made COD or on Net-30 day terms to users with established accounts.

During the warranty period, users must return defective parts upon request to receive no-charge warranty services. Return shipping expenses are the responsibility of the user.

Return Instructions

Contact LPB Communications at + 1 -856-365-8585 for a return authorization number. Pack all items carefully and ship prepaid, via UPS insured, to:

LPB Communications, Inc.

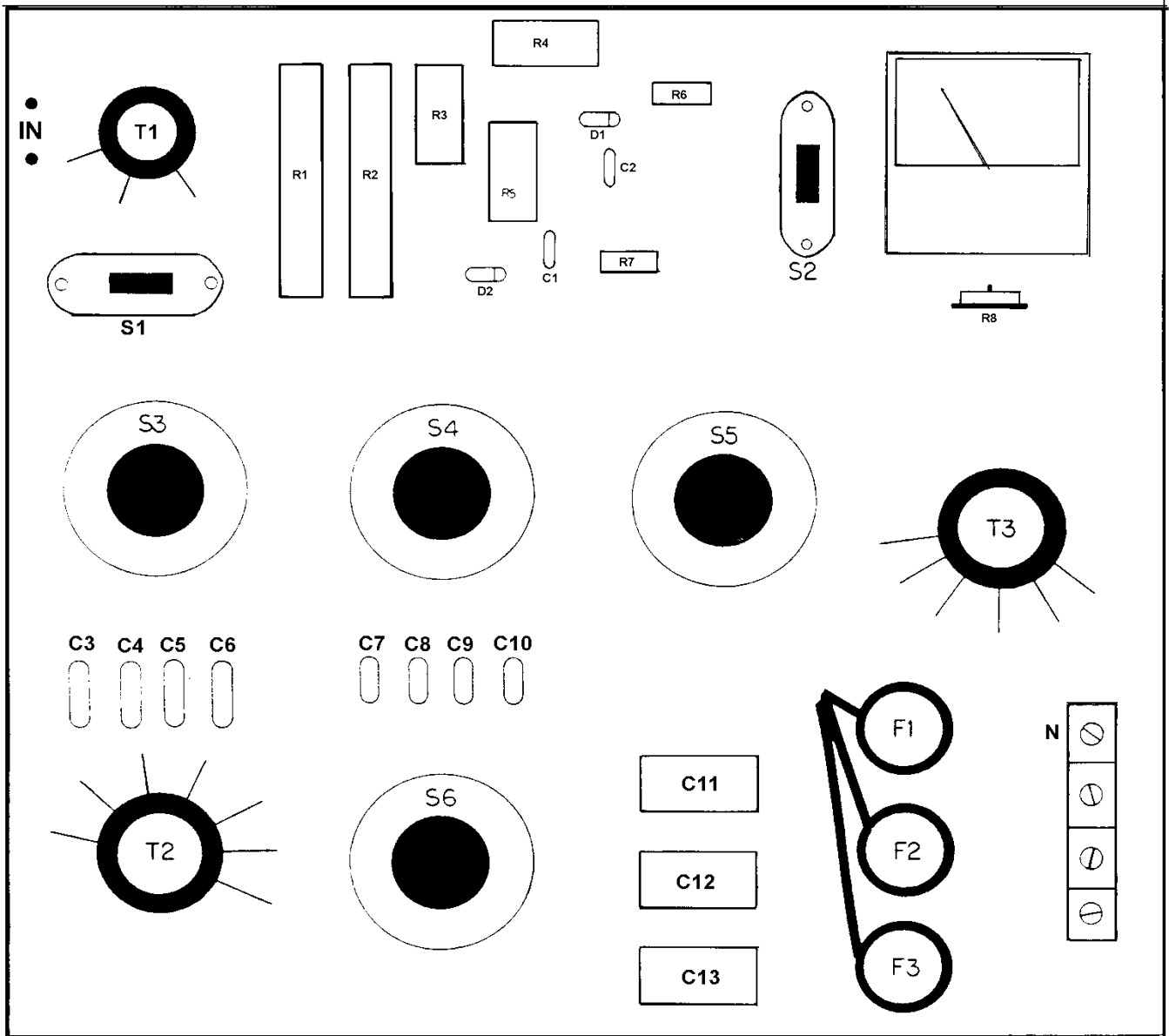
Attn: R.A.# _____

311 Spruce Street

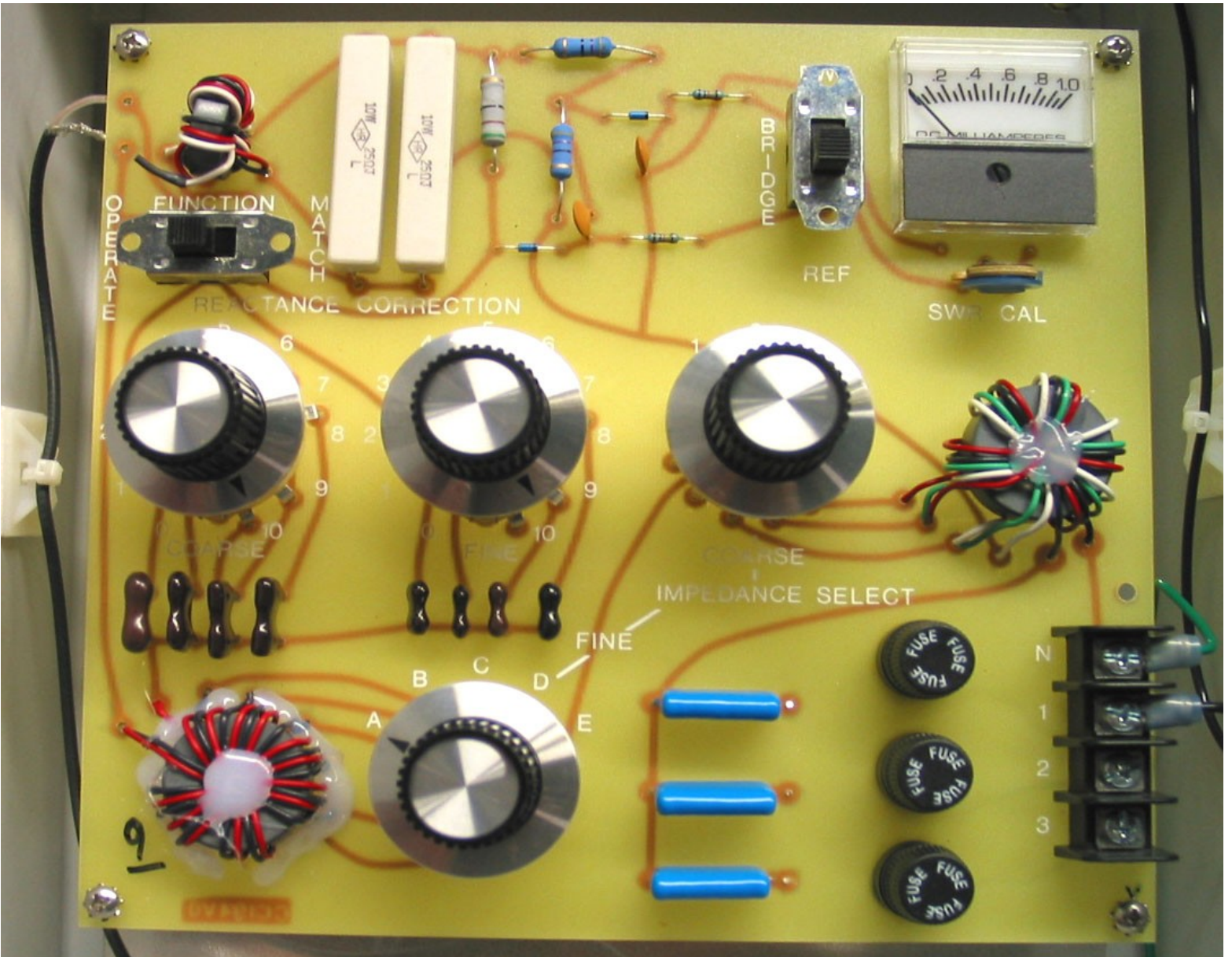
Camden, NJ 08103

Enclose a note which includes your name, company, phone number, the serial number, return address (no box numbers), and a complete description of the problem.

ATU-20 Antenna Coupler Unit Parts Layout



ATU-20 Antenna Coupler Unit Top View





*LPB Communications, Inc.
311 Spruce St.
Camden NJ 08103
856 365-8585 Phone
856 365-8999 Fax
www.lpbinc.com*

Operating Instructions

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- 2 Place S2 in Forward (FWD) position. Meter should indicate full scale. If not, adjust R8 to achieve full-scale reading.
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