



ANTEC COMPANY, INC.

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INSTALLATION

&

OPERATING INSTRUCTIONS

UNIVERSAL TRANSMATCH

MODEL UT-1

IMPORTANT

DO NOT LIFT THE UT-1 BY THE FRONT PANEL! THIS BAND CHANGING PANEL IS COMPLETELY REMOVEABLE WHEN THE TOP IS REMOVED. REMOVAL OF THE BAND CHANGING PANEL SHOULD NEVER BE NECESSARY UNDER NORMAL USE. IF PANEL IS REMOVED, WHEN REINSERTING THE PANEL, CARE SHOULD BE TAKEN TO INSURE THAT THE FOUR LEVER-INTERLOCKS PROPERLY ENGAGE THEIR COUNTERPART CONTACT POINTS (FOUR SMALL FLEX LEADS BEHIND LOWER HALF OF FRONT PANEL).

OPERATION OF THE UT-1 TRANSMATCH

The operation of the UT-1 is simple and straightforward, if the following steps are adhered to.

CAUTION: DO NOT CONNECT, ADJUST OR OPERATE THE UT-1 WITH THE TOP REMOVED.

The top locks firmly onto the open unit. Place the top-piece over the UT-1 with the 4 corner blocks facing downward, and with the engraved arrow pointing towards the front of the unit.

CONNECTING THE UT-1 TO THE TRANSMITTER/RECEIVER OR TRANSCEIVER

1. GROUND the UT-1 by connecting a line from a good electrical ground directly to the GROUND terminal at the rear of the unit. The ground line should be heavy and as short as possible. Wherever possible, ground line lengths close to odd multiples of a quarter-wave-length at the operating frequencies should be avoided.
2. Connect the transmitter/receiver or transceiver to the UT-1 as shown in Figure 1. The transmitter output is connected to the COAX INPUT jack at the rear through a T-R switch (unnecessary if a transceiver is used), a low pass filter (if used), and a 50 to 70 ohm SWR Indicator. Use short lengths of 50-70 ohm coax to make these connections (as short as possible).
3. The use of a properly adjusted lightning arrestor in the feedline is recommended.
4. For use with a coax fed antenna, connect antenna directly to the COAX OUTPUT jack at the rear of the UT-1.
5. For use with antennas fed with open wire feeders or twin lead, connect the line to the 2 red terminals marked FEEDERS at the rear.
6. For use with random wire or long wire antennas, connect to the red feeder terminal marked SINGLE WIRE.
7. The UT-1 is beautifully enclosed in 1/4 inch Plexiglas, which allows for the highest possible circuit Q to be achieved. It is important to note that Plexiglas can be sensitive to excessive heat. Therefore avoid placing the UT-1 directly on top of a transmitter, linear amplifier, etc., unless a suitable air space is left between the UT-1 and related equipment. If a "stacking" arrangement is required, it is recommended that a space of 2 to 3 inches and a 3/4 inch plywood shelf be used between the top of the hot equipment and the UT-1.
8. The bottom and top of the UT-1 are covered with paper. This covering may be stripped off if desired. Note that leaving the paper on the bottom of the UT-1 may be an aid against slipping, depending on the surface directly under the unit.

OPERATING INSTRUCTIONS

1. With the UT-1 connected as above, set the transmitter in stand-by position. Proceed to set the UT-1 for the desired band by opening the band changing panel and setting the 2 main band-taps on the coil for the particular band. The band-taps are the large copper clips attached to the far ends of the inductor. Use the following chart, and note that the coil is always tapped the same distance from each end of the coil. SEE FIGURE 2.

<u>BAND</u>	<u>TAPPING POINT-USE LARGE COPPER CLIPS</u>	<u>LINK TAP</u>
80/75 ^{75/80}	tap to clip-retaining posts on front panel (no turns shorted - see note below)	tap to link turn #5, 6, 7 or 8.
40 ⁴⁰	tap to pair of tapping points about mid-way in from coil ends (23 turns shorted)	tap to link turn #4, 5, 6 or 7.
20 ²⁰	tap to 1st heavy turn of coil (30 turns shorted)	tap to link turn #2, 3, 4 or 5.
15 ¹⁵	tap to 2nd heavy turn of coil (31 turns shorted)	tap to link turn #2, 3 or 4.
10 ¹⁰	tap to 3rd heavy turn of coil (32 turns shorted)	tap to link turn #2, 3 or 4.

It is convenient, for operation on 80/75, to attach the main band-taps to the retaining posts on the back of the front panel. These are the 2 posts which are used as clip-retainers for the optional 10 meter clips, as explained below, in step 2.

2. The clip-leads attached to the retaining posts on the back of the front panel are used only for 10 meters, should difficulty be encountered in achieving a good match on that band. For 10 meters, simply attach these clips to the 40 meter tapping points. Proceed to tap the main band-taps to the 10 meter points as normally done. This should make matching on 10 meters less critical.
3. For greatest flexibility, the link coil (centermost, 8 turn coil) is also tapped by means of a clip lead. Using the above link tap chart, tap to an appropriate link turn for the band in use. The final tapping points on the link are found by trial and error; however, they will likely be found within the limits of the above chart. Once located for a particular antenna and band, the tap position may be logged for future reference. SEE FIGURE 3.

4. After the taps are set for the desired band, allow the panel to close and proceed to obtain a 1:1 match at any frequency in that band by adjusting the 3 panel controls as per the directions below. Once familiarity with the UT-1 is gained, band changing will be nearly as quick as the conventional band switch. The system employed in the UT-1 has the distinct advantage of being far more flexible and efficient.

SWR INDICATORS

When adjusting the UT-1 for a 1:1 match, the sensitivity control on the SWR indicator should first be set for full or maximum deflection of the meter in the FORWARD position. Next, switch the SWR indicator to read REFLECTED POWER or SWR and adjust the UT-1 panel controls until minimum reflected power or SWR is indicated on the meter. No deflection in the reflected power or SWR position compared to maximum deflection in the forward position indicates that a 1:1 match has been achieved.

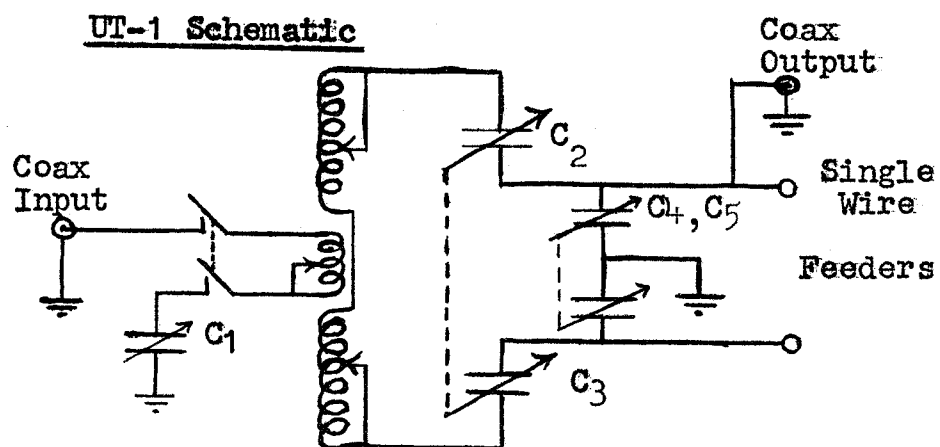
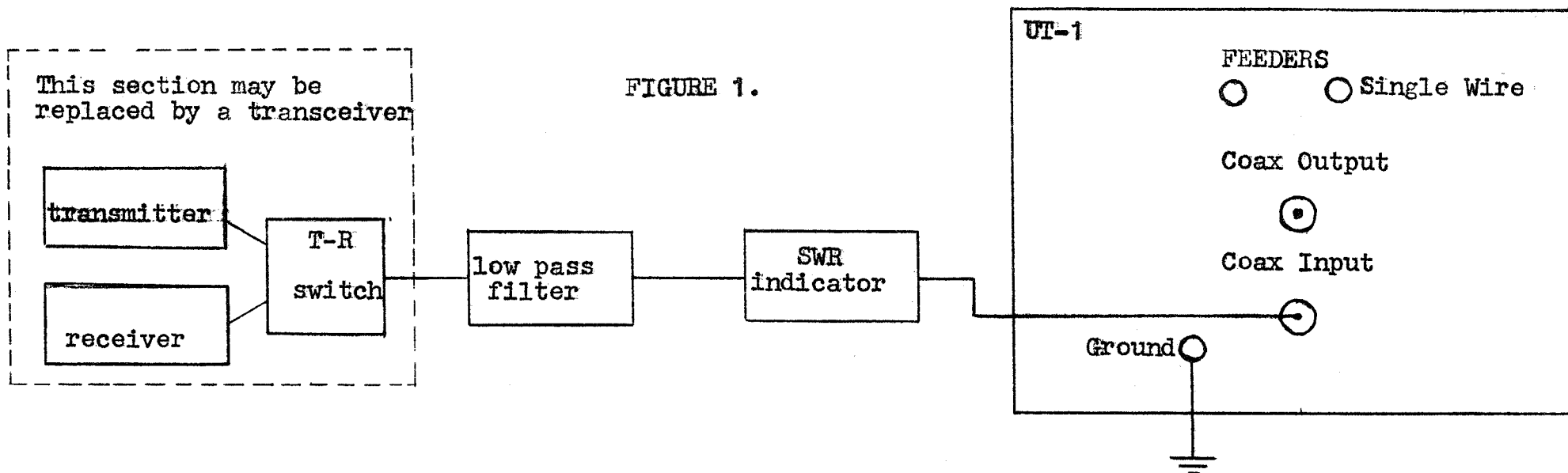
NOTE: Most SWR indicators are frequency sensitive, which means for example, that 50 watts of power may give maximum deflection in the forward position on 10 meters, however 50 watts may give only mid-scale deflection on 80 meters.

MATCHING PROCEDURE

IMPORTANT: Do not open the band changing panel while transmitting or while applying RF energy to the UT-1. The link is equipped with interlocks, which are opened when the band changing panel is opened. Therefore, do not open the panel while transmitting since damage to the transmitter and associated equipment may result. Make all band changes while the transmitter is in STANDBY position, receive for transceivers. Disengage VOX control prior to opening panel.

1. It is essential that low power levels (less than 200 watts) be used when determining a matched condition. After a match has been found, full power, (1 KW CW, 2 KW PEP SSB, Transmitter Input), may be used. With any given antenna the settings of the panel controls and the link tap setting may be logged for future reference. It will be possible, under practical conditions, for just one link tap setting to be used for an entire band, thereby making it possible to QSY anywhere within a band without having to open the panel. It will be necessary to "touch up" the 3 panel controls when QSYing within a band; however, some settings will be broad enough (depending on the antenna in use) so that excursions of about 25 KHz will be permissible without re-adjusting the UT-1 panel controls.
2. To begin the matching process, be sure the transmitter is in standby position. Open the panel and check that the main band-tap clips are properly located for the band in use. Check that the link tap is within the range of the above chart for that band. Release the panel and proceed as below.
3. It may be possible to get a rough indication of the proper settings for a match by using the UT-1 panel controls to peak a weak signal in the receiver (near the transmitter frequency). Set the UT-1 for the proper band as above and rotate the panel controls for a signal peak.

4. If step 3. has been followed (peaking with the receiver), apply power through the system - key down, 200 WATTS or LESS -. Slowly rotate the link coupling, matching and tuning controls (the order is not critical) until a dip is noticed on the SWR indicator which must be in the reflected power or SWR position. Continue to alternate from one control to another on the UT-1 until minimum deflection occurs. See note on "SWR INDICATORS", above.
5. If step 3. is not followed, set the link tap to a point within the range suggested by the chart above. Set the main band-taps to the desired band. Set all panel controls to maximum (10). Apply power through the system (key down, 200 watts or less). Slowly rotate the controls until a dip is noted in the SWR or Reflected Power. See note on "SWR INDICATORS", above. Alternate between the 3 controls until the minimum deflection occurs in the SWR indicator.
6. At all times during steps 4. and 5. above, keep the transmitter amplifier dipped for resonance; or, alternatively, keep the power output level constant. Do not use the UT-1 for purposes of altering the transmitter loading. Always use the transmitter controls to maintain the proper amplifier operation.
7. If a true 1:1 match cannot be achieved, place the transmitter in stand-by and open the band-changing panel. Proceed to move the link tap up or down (to the right or left) one turn. Release the panel and proceed as in steps 1. thru 6. Note the usual variable range of link tapping points as indicated by the above chart.
8. The large band-tap clips determine the band in use. For purposes of achieving a matched condition on the amateur bands, the tapping points indicated by the chart will not need adjusting. These tapping points and band-tap clips are equivalent to the conventional band switch, but are more efficient. Do not move these taps as an aid in locating a match. All matching is done with the front panel controls in conjunction with the proper setting of the link tap.
9. For operation on frequencies other than those in the amateur bands, a trial and error process should allow for proper matching at any frequency between 3.5 Mhz and 29.7 Mhz. As an example, if operation near 5 Mhz is desired, the band-tap point will be found somewhere between the 80 and 40 meter points. If operation at 9 Mhz is desired, the band-tap point for the main clips will be found between the 40 and 20 meter points, and so on. The use of a receiver for this purpose is suggested as in Step 3. In all cases, symmetry should be maintained with respect to the main inductor. That is: if 12 turns are shorted by the left band-tap clip, then 12 turns must be shorted by the right band-tap clip. Interpolation of the above chart will also approximate the range of the link tapping points.
10. The UT-1 can be a great aid for general SWling. Simply peak signals, as in Steps 3. and 9. above, to determine the position of the main band-tap clips. Then proceed to peak signals further by adjusting the link tap and 3 panel controls.
11. If the UT-1 is not used regularly, it may become advisable for the operator to lightly use fine sandpaper or emory cloth on the contact areas of the copper clips, should they become tarnished.



$C_1 \dots 335 \text{ mmfd, } 2\text{KV.}$

$C_2, 3, 4, 5 \dots 100\text{mmfd, } 4.5\text{KV.}$

FIGURE 2

USE SAME PROCEDURE FOR
RIGHT-HAND SIDE OF
MASTER INDUCTOR

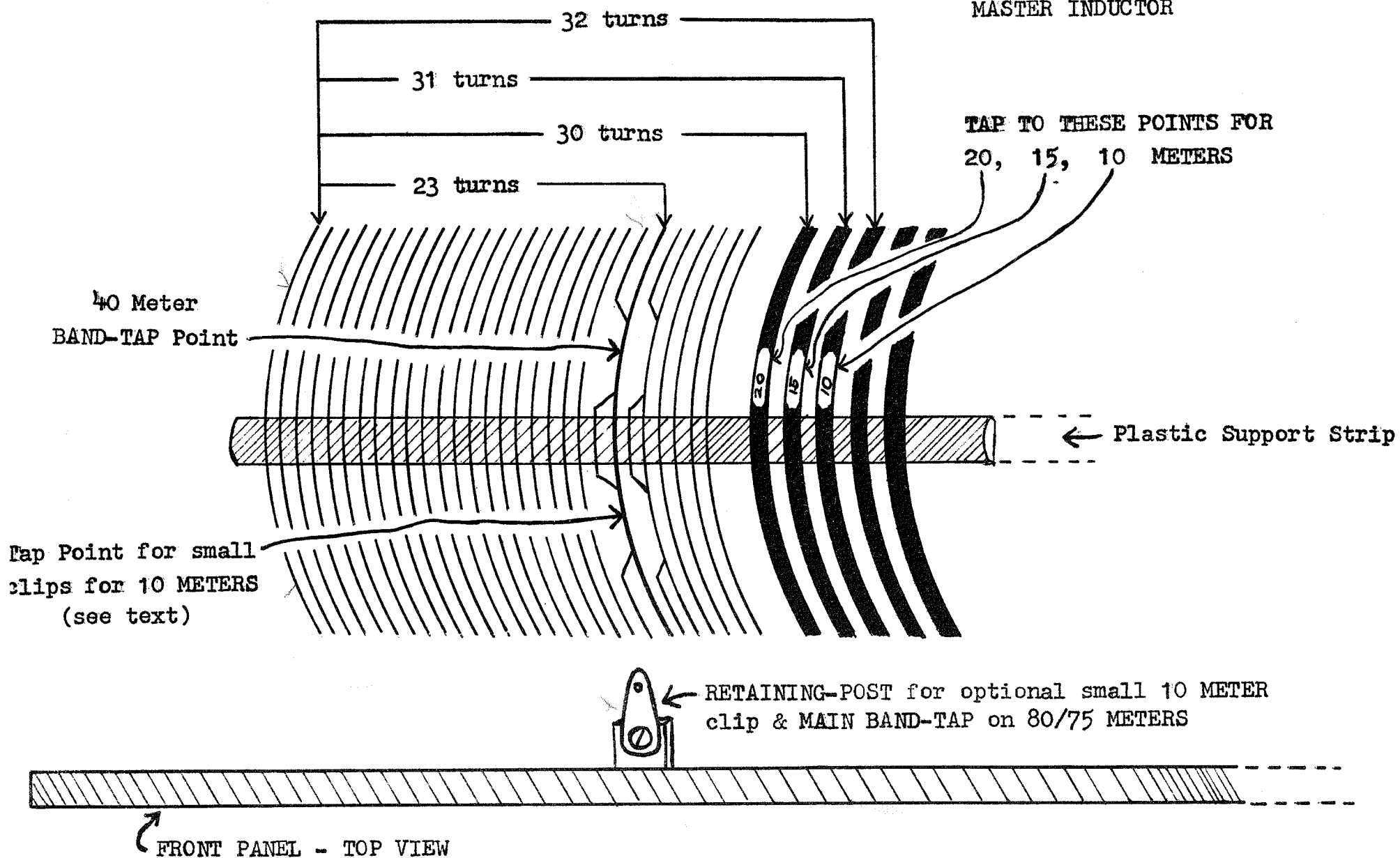
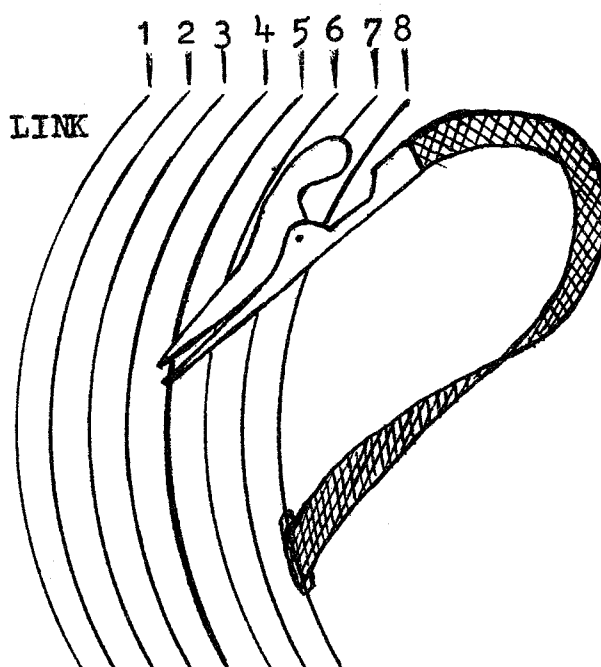


FIGURE 3



The range and flexibility of the UT-1 is enhanced by the link-tapping system. It is essential that the operator employ the proper placement of the link tap, relative to the particular antenna and band in use. For the purpose of clarity, see the illustration of the link in figure 3. The link is shown tapped to turn #5, as it might be in actual operation on 40 meters, for example. Note that in general, the link should be kept as small as possible.

Use the following steps in determining the proper link tapping point:

1. Tap to within the range of the chart and find a proper match as per instructions.
2. Use as little link in the circuit as possible to give a proper match, and to allow full band coverage. In other words, keep the link tap to a point as far to the left as possible while maintaining a match.

As a case in point, we consider 40 meters. The link tap chart indicates to tap to turns # 4, 5, 6 or 7. In practice, if a 1:1 match can be found, for example, by tapping to either turn 5 or turn 6, then it is advised that turn 5 be used.

Normally several combinations of link tap settings vs. panel control settings will be found to provide a 1:1 match for the transmitter on any given band.

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WARRANTY

Adopted and Recommended by the
Electronic Industries Association

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED AND NO REPRESENTATIVE OR PERSON IS AUTHORIZED TO ASSUME FOR US ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF OUR PRODUCTS.

The Antec Company, Inc. warrants each new product manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part, except for electron tubes, in exchange for any part of any unit of its manufacture which under normal installation, use and service disclosed such defect, provided the unit is delivered by the owner to us intact, for our examination, with all transportation charges prepaid to our factory (return transportation charges also to be paid by owner) within one year from the date of sale to original purchaser and provided that such examination discloses, in our judgment, that it is thus defective.

This warranty does not extend to any of our products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, use of acid core solder, unauthorized modifications, or to use in violation of instructions furnished by us, nor extend to units which have been repaired or altered outside of our factory, nor to cases where the serial number thereof has been removed, defaced or changed, nor to accessories used therewith not of our own manufacture, nor to electron tubes.

SPECIFICATIONS MODEL UT-1

80 thru 10 meters, 2 KW PEP power handling capability
Provides 50 to 70 ohm resistive load for transmitter/receiver
Matches loads from 25 to 4500 ohms
25 db average additional harmonic suppression
5 db average improvement in receiver S/N ratio
Minimal insertion loss
Use with any type transmission line...coax, open wire, single wire, etc.
Use with dipoles, inverted vees, random wires, multi-band zepps, beams, quads, verticals, trap dipoles, trap beams, folded dipoles, etc.

TROUBLE SHOOTING HINTS

1. Be sure the unit is properly connected to associated gear. See instructions.
2. Make certain all connecting cables are properly assembled...no shorts or poorly installed connectors.
3. Make certain the antenna system is properly installed.
4. The UT-1:

A. Check that the ganged Matching and Tuning capacitors are in fact properly ganged...that is, both capacitors in each set should reach the point of maximum capacitance (fully meshed) simultaneously. If they are not properly ganged, loosen the screws in the insulated shaft coupling and re-set the capacitors. Tighten the screws securely. DO NOT Over-tighten.

B. Make certain the four interlocks behind the front panel are properly engaging their respective flex-lead contact points on the foam pads.

C. Make certain the copper clips on the master inductor are not corroded. Clean the contact areas of the clips with emery cloth (fine sandpaper).

5. EXTRA TIP FOR RANDOM WIRE OPERATION (LONG WIRE)

When using the UT-1 with a random wire antenna, it is sometimes preferable to ground the opposite Red Feeder Terminal. Simply connect a #14 or heavier copper wire from the Ground Lug at the rear of the unit to the Red Feeder Terminal directly above it. All other instructions in the manual apply as per normal operation.

6. EXTRA TIP FOR USE WITH COAX FED ANTENNAS

When using the UT-1 with a coax fed antenna, it is sometimes preferable to ground the Red Feeder Terminal marked Single Wire. Simply connect a #14 or heavier copper wire from the Ground Lug at the rear of the unit to the Red Feeder Terminal marked Single Wire. Do not connect a ground wire or any other wire to the remaining Red Feeder Terminal.

The application of steps 5. and 6. is proper when achieving a 1:1 match seems too critical, or where heating of the master inductor is noticeably excessive. Note: with 2KW PEP transmitter input, slight warming of the master inductor is a harmless condition.