



Unique PRODUCTS COMPANY

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UNIQUE WIDE RANGE WIRE TUNER

Description: The Unique Wide Range Wire Tuner is an impedance matching device offering two "L" network configurations (see page 5). The configuration is changed by feeding either input coaxial connector while grounding the other with the supplied plug-in jumper bar.

The capacitive element is provided by a 600 pf. air variable capacitor and two 1000 pf. high voltage, high current ceramic fixed capacitors. By proper use of the supplied jumper bar, a continuously variable capacity range of 25 to 1600 pf. is provided.

The inductive element is a continuously variable inductor with a maximum inductance of 28 micro-henries. Exact resetability is provided by a turns counting dial calibrated in 1/100's of a turn.

No R.F. conductors are smaller than #12 AWG wire. The quality is superb. The enclosure is 1/16" aluminum finished in attractive two-tone gray textured vinyl paint. The chassis is processed with a conductive "alodyne" chemical film after which three coats of vinyl are applied to the outside.

The combination of the two networks along with the high L and C availability provides the broadest tuning range of any antenna coupling device on the amateur radio market. The Unique Wide Range Wire Tuner will provide a perfect match to nearly any single wire fed antenna system in the frequency spectrum 1.7 through 30.0 Mhz, enabling proper loading and maximum power transfer. It is designed specifically for single wire feed against ground. No provision is made for any type of transmission line beyond the Wire Tuner. This design results in a very compact, economical and efficient matching device capable of handling full legal amateur power. When properly resonated, it will handle in excess of 1,500 watts of output power. An external SWR bridge is used to obtain proper adjustment.

The Unique Wide Range Wire Tuner is guaranteed for one year against defects in design, material or workmanship.

Installation: Although your Wide Range Wire Tuner will match, and couple maximum power to, nearly any single wire fed antenna; it will not make an efficient radiator out of a bad one. For instance, twisting the feedline of a center-fed dipole together and feeding the single wire is a poor system. Because the currents in each half of the dipole tend to cancel, most of the radiation is from the feedline. The best antenna is high, straight and fed from one end. The Wire Tuner will match short wires and provide communication but wires shorter than one quarter wave are less efficient than those which are longer. Since the feedline radiates, keep it away from surrounding objects as much as possible.

The better the ground system, the better the results. If no ground is available (such as in portable operation); a wire on the ground, one quarter wavelength or longer on the lowest operating frequency, is a practical alternative. Reasonable results can be obtained using vehicles or trailers as a counterpoise.

Operation: Connect the antenna feedline to the antenna terminal and the ground system to the ground terminal of the Wire Tuner. Install the grounding jumper in coaxial receptacle "B" and the associated ground jack. Remove the capacitor jumper. On frequencies above 5 Mhz. this jumper should never be needed, and is seldom required above 2.9 Mhz. Connect the output of your SWR bridge to coaxial receptacle "A". Connect your transmitter to the input of the SWR bridge. This setup should be used whenever possible as it provides harmonic attenuation that the other configuration does not.

There is only one value of L and one value of C that provides a perfect match. There is no compromise. For this reason, initial matching with the Wire Tuner is a two-handed operation. Once you have obtained, and logged, settings for each band with your antenna system; you can quickly duplicate them and only minor touchup is required. Matching is easiest on the 40 meter band, most critical on 10 meters and most difficult on 160. If a dummy load is available, tune up your transmitter into the dummy load on 40 meters. Then reconnect it through the SWR bridge to the Wire Tuner. Rotate the roller inductor dial fully counter-clockwise to the stop. The dial will read 00.05. Switch to the receive mode and proceed with the following, attempting to get maximum received signal or background noise. Advance the roller inductor clockwise and, simultaneously, rock the variable capacitor from zero to ten and back. When you have found a combination of settings producing the best received signals, you are ready to apply power and tune for a perfect match.

NEVER USE A HIGH POWER AMPLIFIER UNTIL A PERFECT MATCH HAS BEEN OBTAINED. THIS CAN DAMAGE THE AMPLIFIER AND THE WIRE TUNER AND VOID THE GUARANTEE.

Set the SWR meter sensitivity to maximum and the transmitter "DRIVE" control to minimum. Switch the transmitter mode switch to "TUNE" and advance the drive control only enough to obtain a full scale reading of forward power. Switch the SWR meter to reflected power. If you have tuned the transmitter into a dummy load, do not change the tuning. If you have not, set the loading control for 50 ohms and adjust the final "TUNE" control for maximum output. This will need readjustment whenever you change the Wire Tuner settings, to maintain maximum output. Adjust the two controls of the Wire Tuner simultaneously for zero (0) reflected power, retuning the transmitter final tuning as necessary. As the match approaches 1:1 SWR, the forward power will appear to decrease. Increase the drive continuously to get a full scale reading of forward power. When zero reflected power is achieved, reduce the SWR meter sensitivity and tune the transmitter for full power in the usual manner. If some reflected power is evident, you may "touch-up" the adjustment of the Wire Tuner. Now try tuning up on 20, 15 and 10 meters, in that order.

On the twenty, fifteen and ten meter bands; never use more than 10.00 turns of the roller inductor. Settings with more inductance produce a false match and arcing may occur even at low power. Go back to 00.05 and proceed slowly until the proper match is found. It is quite critical on these bands.

Generally, less inductance will be required as the frequency is increased. On ten meters it is not unusual to use less than 1.00 turns of the roller coil. This does not necessarily hold true on 80 and 160 meters. On these bands, nearly any combination of L and C may be required.

MATCHING ON 80 METERS: The tuning procedure on 80 is the same as above, with the following exceptions; If the best, but not perfect, match is obtained with the variable capacitor at maximum (10 on the scale); insert the capacitor jumper bar between the "add 500 pF" jacks and retune for a perfect match. If a match absolutely cannot be obtained, move the grounding jumper from coaxial connector "B" to connector "A", the coax to "B" and repeat the entire matching procedure.

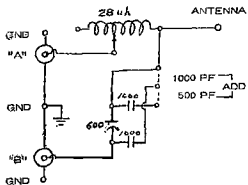
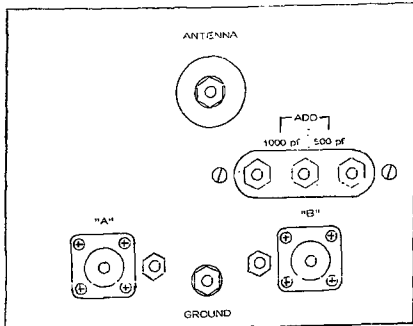
MATCHING ON 160 METERS: Matching on 160 is difficult only in that the L and C requirements vary over an extremely wide range of values. The procedure is the same as for 80 meters except that there are six possible setups and any one of the six may be required. The six possibilities are listed below in the order that you should try them.

- 1A. Feed "A", ground "B", no capacitor jumper 10^{-4}
- 2A. " " " " , jumper add 500 pf.
- 3A. " " " " , jumper add 1000 pf.
- 1B. Feed "B", ground "A", no capacitor jumper
- 2B. " " " " , jumper add 500 pf. $35^{-3} - 2$
- 3B. " " " " , jumper add 1000 pf.

One combination feeding "A" and one feeding "B" will both usually, match the same antenna. Feeding "A" is the most desirable for harmonic suppression. Some antennas can only be matched with one combination. If you use the capacitor jumper, be sure to remove it for matching on other bands.

If for some reason you are unable to obtain a match, write Unique Products Company for assistance. Include a detailed description of your antenna and ground installation with dimensions, height and any other pertinent information.

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