

MERCURY AMATEUR RADIO ASSOCIATION MARA - NORTH AMERICA - NORTH EAST

Newsletter - June 2007



Statistically, June is the favorite month for marriages, and according to the National Safety Council, it is also National Safety Month.

Do you think there's any connection between the two?



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NEXT MONTH...

REPORT FROM THE MARA NE
ANNUAL MEETING

L - MATCH TUNER

VE1VQ

Out of all the many tuner designs around, my favorite - the L-match - is about as basic a matching system as you can get. Two components – a series reactance and a parallel reactance – will match just about anything to the 50 ohm output of

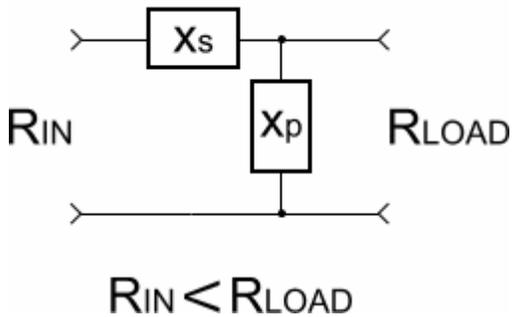
1

E-mail your comments, ideas, or submissions to marane@mara.net

Please send copies of any old newsletters or pictures you might have, for the archives.

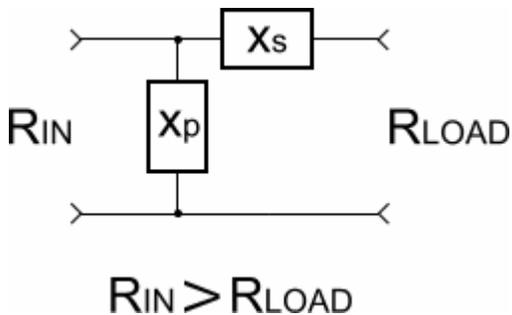
Join us on the Saturday morning SSB net at 0730 Eastern time on 3.8725 MHz

your transceiver, and with as low an insertion loss as possible.



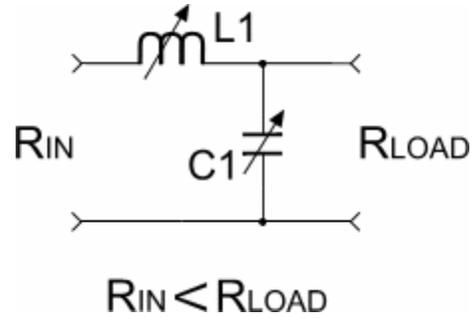
Use the above configuration if the load (antenna) resistance is greater than the input resistance.

Use the configuration below if the load resistance is less than the input resistance.

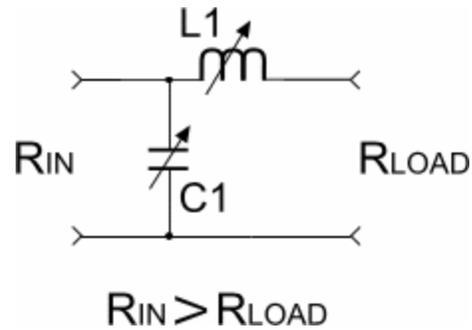


The tuner can be made up of fixed value components for a segment of single band use, switched inductors and capacitors as in the commercial auto tuners of today, or for the ultimate in manual matching – a variable inductor and capacitor.

Typical connections are shown below...



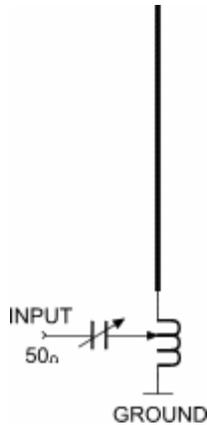
And...



Perhaps you want the positions of the capacitor and inductor to be reversed. Instead of the inductor L1 as the series reactance and C1 as the parallel reactance as shown above, C1 would become the series and L1 the parallel.

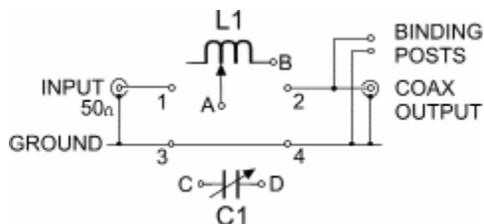
An example of where this may be desirable is the case of a vertical antenna (see below). Here the coil would go from the vertical element to ground (radials are not shown) to bleed off any static charge developed by snow or wind.

If the impedance of your vertical is such that matching it to 50 ohms and having the coil as shown below are not compatible, then at least put in a resistor with a value of a 100K or greater.



The L-match is built on a piece of plywood, plastic, or some other insulator. The inductor and capacitor float - that is, they are not permanently connected to the input, output, or ground but are configured as needed.

To make the circuit as shown above, simply connect L1-A to 2 and L1-B to 4, and connect C1-C to 1 and C1-D to 2. The antenna feed comes from the upper binding post while the radials connect to the lower.



This is not a balanced circuit for balanced lines but is intended for an antenna fed with coax, or a random length wire.

COMPONENT VALUES

You might think that you should use large value parts to cover the

greatest range of reactance. Unfortunately then you run into the problem of minimum value. With real world capacitors and inductors, it is impossible to go to zero. Even with that capacitor fully open there is still a measurable amount of picofarads. This is not a problem on the lower frequencies but instead comes into play on fifteen, twelve, and especially ten meters. You may find, even after all the various coil and capacitor combinations have been tried that the lowest SWR corresponds with a wide open capacitor or the end of the last turn on the inductor. If that is the case, it is better to use a smaller capacitor with a lower minimum value and connect additional variable sections or fixed capacitors in parallel when needed. Look for an inductor with the last few turns spread further apart as shown below.



For capacitor value, look for something with a top range of 200 – 500 picofarad (pf) and for an inductor - 28 – 55 microHenrys (uH). If most of your operating is done on the lower bands go for the larger sizes. On the other hand, if your preferences are for ten meters, build with the smaller.

If you have something in the junk box, try it anyway.

PARTS ACQUISITION

At one time, every house radio was a source of a variable capacitor. Now, you MIGHT find one in someone's attic or garage sale - if they aren't selling it on EBAY!

Capacitors from old radios should be able to handle output from the typical 100 watt transmitter (see the **TUNING** section that follows).

If you know anyone who builds anymore, see if they have any capacitors or inductors in their junk box they'll part with. Otherwise, you can find them at places like [FAIR RADIO SALES](#), [MFJ](#), [SURPLUS SALES OF NEBRASKA](#) (very high in price!), or on EBAY.

If you can find an old WW2 era ARC-5 transmitter you'll have a variable inductor and a pair of variable capacitors to use but you will have to buy - or make - couplers and extension shafts.

If you are unable to find a variable inductor, make a fixed one out of a piece of two inch pvc or other plastic pipe and wind it from #14 bare copper house wire. Use alligator clips to tap to the correct inductance.

A BOX TO HOLD IT ALL

Take a look at most of today's commercial tuners and you'll find they are very compact. Take the covers off and see how close the

metal cabinet pieces are to the components. Close is **not** good!

Modern rigs are very clean when it comes to spurious transmitted signals. You really don't need aluminum or steel in a tuner to keep the harmonics and spurs contained. For indoor use a better choice would be pieces made from plexiglas or lexan sheet. An advantage of a transparent design is being able to see where the capacitor and coil are tuned.

If this is for outside use in the weather, consider a Tupper-ware style container with a snap type lid. Get one with thick sidewalls. See below.



TUNING

Use reduced power to tune up. It's easier on the components. The closer spaced plates of a broadcast radio type capacitor may mean flashover or arcing when out of tune.

SAFETY

Keep your fingers clear of the innards and use an insulated coupling on the capacitor, and the inductor shaft also, if it is connected to the coil itself. Speaking from

experience, RF burns are not a pleasant thing!

ANNUAL MARA NORTH EAST MEETING - 2ND JUNE 2007 AT THE WASHINGTON D.C. BCS.

FOR DETAILS SEE

<http://ne.mara.net/annualprelim.htm>

DI-DAH-DI-DAH-DIT

How many times have we done something, and afterwards thought - *that was really stupid!*

Is it because we think safety rules are for someone else, that they don't apply to us.

Are we in such a hurry to get things done and we think we can get away with it, just this once?

Or is it because sometimes we don't think at all!

Some years ago, here in southern Nova Scotia, a couple of guys were putting up a television antenna on an aluminum mast. The antenna contacted the power lines and one was electrocuted, as his girlfriend watched.

They were aware of the lines but thought they could avoid them.

They thought they could get away with it.

Just like we all do from time to time.

Only they didn't!

Most times we're lucky and nothing bad happens. Most times if we're not quite so lucky, it's only the equipment that is damaged.

But sometimes, it's us.

And sometimes our luck runs out!

Think safe, act safe, **and stay safe.**

--- MARA NE ---