# The Radio Hotel — – Software Tools for your Feedline
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Computers are wonderful. The ability to program them to perform reiterative calculations, that would take quite some time by hand, can now be done, literally, in milli-seconds. Paper, a pencil and a slide rule was the old school method. Thank goodness!

TL's are a mathematician's playground. There is no guess work, it is all exact calculated answers based on initial measurements and characteristics fed into known, foundation equations. The perfect atmosphere for computer programming to lend a hand. TL cables are manufactured for a specific Surge Impedance/characteristic impedance, power handling, velocity factor and have a known capacitance per foot, dielectric loss, etc. Since these quantities are "designed for", the designer uses equations to figure out the manufactured configuration. If all of the design and resultant attributes can be calculated, then a computer program to do all of these calculations is easily coded up. In fact, there are 2 such packages readily available: **TL Details** and **TLW**.

TL Details, by **Dan Maguire, AC6LA**, is shown below at the left. The top half is input data and the bottom half is the result. Many cable type characteristics are pre-loaded so you just pick a type, set the frequency, the length and power and the calculations are dynamically performed. The results show you power, total loss and where that loss occurs, also, the impedance transformation for that particular length of TL, if in an unmatched condition. In addition, a rudimentary Smith Chart is shown for a gross reference on the impedance result. The entry fields have up and down buttons to increase or decrease the values and if you hold them down, the resultant values will change and the Smith Chart will replot in real time. Using this feature you can see very "movie like" changes happening over the TL as the length, the load or the source Z changes, etc.
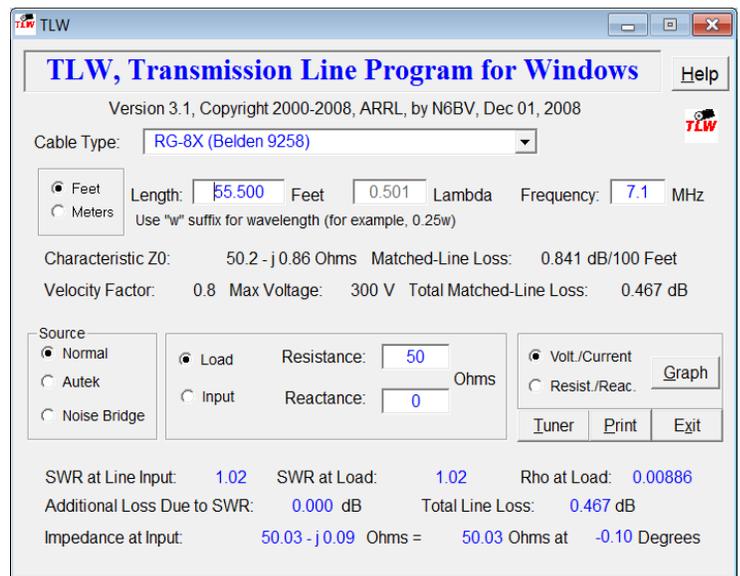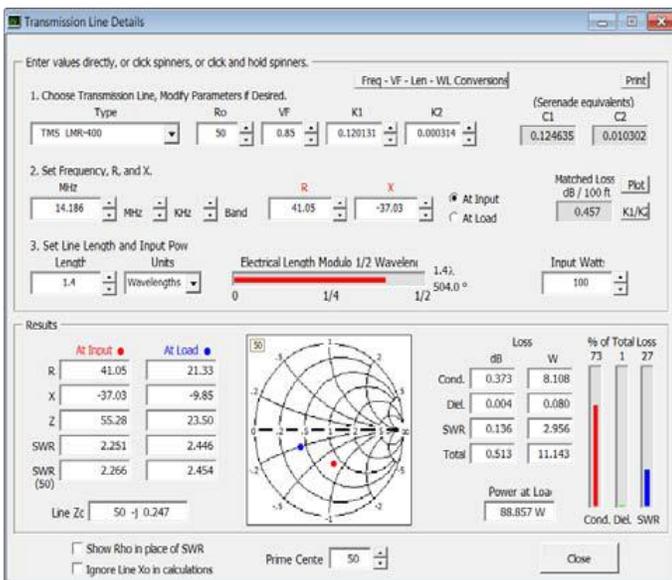
TLW, the GUI on the right, is from ARRL, written by **Dean Straw, N6BV**. Similar in function to TL Details, with no Smith Chart, but an additional function for creating a schematic of a matching network "tuner" in various configurations, i.e. High Pass, Low Pass, etc. Additionally, once you settle on the TL variables you can get a graph plot of the voltage and current excursions on the TL. This is quite helpful when dealing with non-matched lines where the voltages can become quite high and exceed the breakdown voltage of the coax dielectric. TLW has a particularly nice HELP file.

Google **TL Details** for download sites. **TLW** is included in the ARRL Antenna Handbook.

GL ES 73 DE W5RH Enjoy your hobby.