Looking at RG-62A/U

There are probably many Radio Amateurs whose delight on finding a useful looking roll of coaxial cable in a skip has been dashed when they discovered that it was RG-62A/U. This is a cable, often used in computer networking and has a characteristic impedance of 93Ω.

However, this apparently useless cable deserves further consideration, especially by those of us of a frugal nature. First, there are certain cases where it is appropriate to use a line of 93Ω impedance. Second, its r.f. characteristics are good and this may allow it to be used, with acceptable losses, at an s.w.r. of up to 3:1.

Antennas Impedance

First, let's look at antennas whose feed impedance is close to 93Ω (resistive). The first of these is a dipole about 3λ/8 wavelengths above ground.

For example, a low-v.h.f. band dipole installed by the typical urban Amateur at 10m (30-35ft) above the ground. To feed it with RG-62A/U you just make the dipole as usual and trim it for minimum s.w.r. However, you must use an s.w.r. meter that has been designed for use with 93Ω impedance coaxial cable.

Fortunately, this is very easy. Make the well-known Stockton s.w.r. meter but use 180Ω resistors instead of the 100Ω resistors that are shown in the circuit. It's not even necessary to change the short length of screened 50Ω coaxial line in the meter.

If your rig has an auto a.t.u. there should be no further problems. However, if it was designed for a 50Ω load then you will have to make a simple matching circuit, for example the L-match, to ensure that it loads up to its full power rating.

Another antenna that's suitable for direct feed with RG-62A/U is the cubical quad or delta loop. In this case the feed impedance is about 110-120Ω and as before you trim the loop for minimum s.w.r. using the correct s.w.r. meter. Again you may have to make an a.t.u. to keep the rig happy.

Feeding the G5RV

It is quite acceptable to use RG-62A/U to feed a G5RV. In fact, on 14MHz (20m) it will give an excellent match as the bottom of the stub has a resistive impedance of about 90Ω. On the other bands the s.w.r. should be quite acceptable. Remember a correctly installed G5RV should not show unity s.w.r. when fed with 50Ω coaxial on any band. (As before an a.t.u. may be necessary to keep the rig happy.)

Input Impedance

The input impedance of an electrical λ/2 of coaxial cable is exactly the same as the impedance in which it's terminated irrespective of the characteristic impedance of the cable itself. Hence, you can feed other antennas such as dipoles, with RG-62A/U by making the feeder a whole number of half wavelengths long. (The rig 'thinks' that 50Ω coaxial is being used.) Don't forget to allow for the velocity factor of the coaxial, which in the case of RG-62A/U is 0.84.

A low 3.5MHz dipole whose feed impedance is about 50Ω can be fed as shown in **Fig. 1**. In this case the s.w.r. meter is the normal 50Ω type and as usual you just trim the dipole for minimum s.w.r. The only snag is that the antenna system will

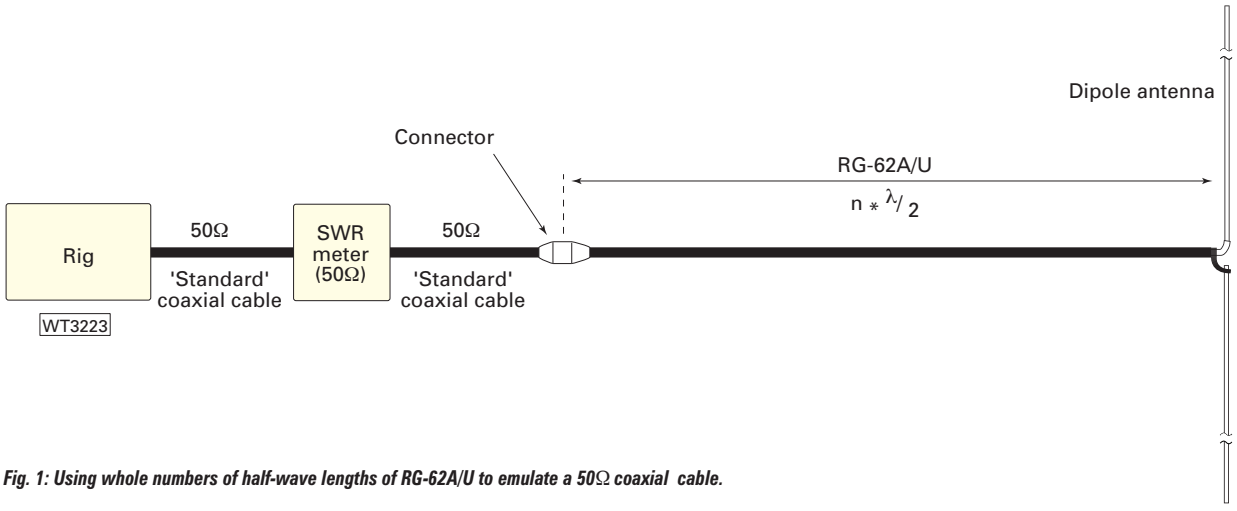

Fig. 1: Using whole numbers of half-wave lengths of RG-62A/U to emulate a 50Ω coaxial cable.

Gerald Stancey G3MCK shows that even RG-62A/U, that apparently useless coaxial cable, can have its uses.

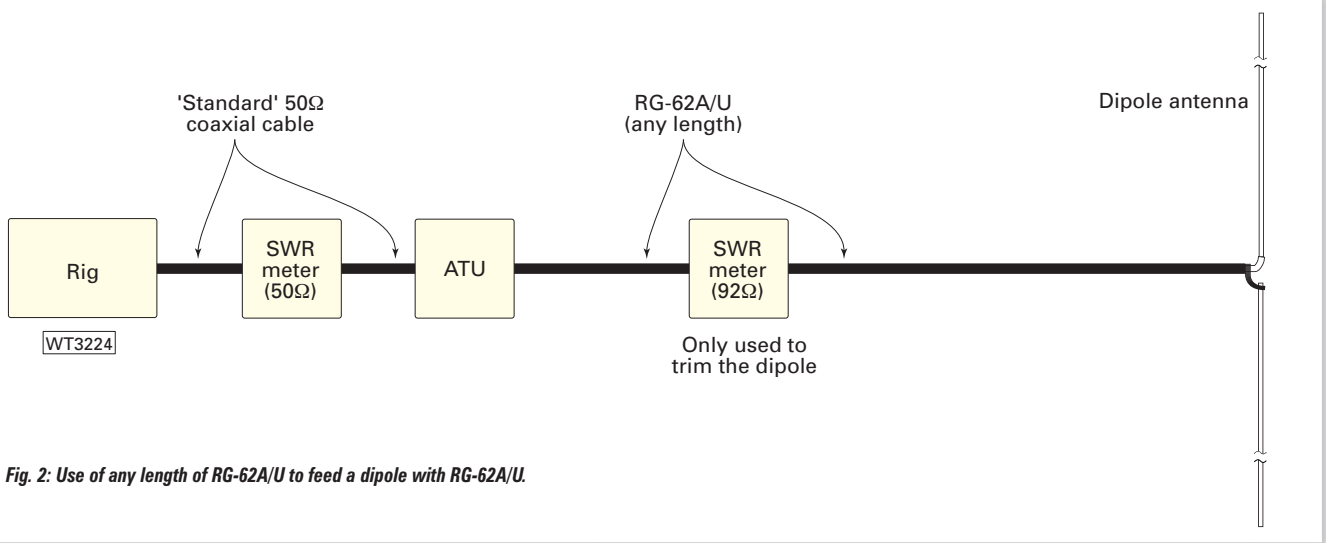

Fig. 2: Use of any length of RG-62A/U to feed a dipole with RG-62A/U.

have a narrower bandwidth than when it's fed with 50Ω feeder. This may not be a problem and it can always be overcome by using an a.t.u. at the transmitter.

If you can't be bothered to cut your RG-62A/U to an exact length then simply use an a.t.u. to keep the transmitter happy. The procedure is to trim the dipole for minimum s.w.r. using a s.w.r. meter designed for 93Ω line, then couple the rig to the line through a matching unit, as shown in **Fig. 2**. The a.t.u. must be adjusted so that there is unity s.w.r. on the 50Ω line between the rig and the a.t.u.

Those who fear that using RG-62A/U in this manner will incur horrendous losses can take comfort from the following calculation. Assume that we are feeding an 3.5MHz (80m) dipole through 30m of RG-62A/U with an s.w.r. of 2:1. Tables show that the loss of the line when matched will be about 0.6dB and that the extra loss due to the s.w.r. is 0.05dB. This gives total line loss of 0.65dB, which compares favourable with the loss of 0.85dB that would be incurred by using 30m of RG-58A.

Useful & Cost Effective

So, to summarise, RG-62A/U cable makes a useful and cost effective feeder for Amateur Radio installations. It's often available in long lengths from buildings that are being refurbished, often for the price of a pint. I hope this article has encouraged you to keep a lookout for unusual items that often have a practical use to the Radio Amateur. You just have to think sideways! ●