Roy Walker G0TAK's Antenna Workshop
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The Rainbow Antenna

(You'll soon see the reason for the name!)

In his visit to the *Antenna Workshop*, Roy Walker G0TAK says there's a rainbow over Cumbria!

I'm very lucky in the Amateur Radio field, people who know that I'm interested in training young people (principally in the Air Training Corps) give me bits of unwanted kit to use for the training. I have also trained myself "*never to say No*", just in case the stuff may come in useful.

The latest acquisition is a couple of rolls of American 'Planar cable' (flat) which, as it says on the label is "Appliance wiring material intended for internal wiring of electronic equipment". Each roll contains 100ft (sorry Editor – 31.25m – but it is American!) of ribbon cable with 26 individual wires, each of 28a.w.g. diameter, and rainbow coloured for ease of identification. I felt that there must be a use for this booty, other than only as stated 'on the box'.

With the relatively small diameter of each conductor – it is after all only 'hook-up' wire – there will be limited current carrying capacity. You can get over this restriction of course by 'doubling-up' wires, or even going to the extent of using the whole of the ribbon as a single cable.

One of the biggest advantages is that the cable rolls up nicely, without any of the knots and twists associated with normal cable. This makes it ideal for portable operation. How about these for a few ideas for antennas?

The NVIS Antenna

To create an antenna suitable for near vertical incidence skywave (NVIS) use, cut off 32 feet (10m) of the cable, bare and tin all the wires at one end and solder them to a single common point **Fig. 1** and **2**. Stretch out and support the wire on the top of a few agricultural 'electric fence' posts and feed it against ground, or another similarly prepared counterpoise cable.

Depending on propagation and your choice of frequency, this will be superb for NVIS propagation. The United States Army has used antennae similar to this to great effect.

Long Wire

For use just as a long wire, without cutting the wire to any specific length, prepare the wire as for the NVIS antenna. Unroll it from the reel to the furthest you can reach, throws it over a tree, rest it on a hedge, whatever you can find. It will not be significant if there's still a bit of wire still on the reel. Feed it against a decent ground and you're in business!

A 9:1 'unun' would probably be beneficial at the feed point to 'tame' any high impedance 'seen' by your transmitter and tuner combination. At the end of the day, pack it back on the roll.

Wire Counterpoise

To use the wire as a counterpoise, prepare the wire as before, cut one or two lengths and use them as a counterpoise to your portable vertical antenna. As an alternative, cut two equal lengths from your roll, though not cut specifically to frequency. Deploy them at the base of your vertical, rolled out to a specific length according to your chosen frequency.

I use a 9m 'Roach Pole' supported vertical to great effect for portable

One end of Roy's 'Rainbow' antenna set out as an NVIS antenna.

operations. It's fed against a decent earth (if I can find one) or a counterpoise, via a home brew 1:1 balun or more recently via a 9:1 unun.

A QRO Dipole

For use as a full-power dipole, cut and prepare two lengths of the wire (cut them a bit longer than you anticipate allowing for trimming), solder all the wires together. mount a dipole centre in the middle and an insulating device at the 'far' ends and you have your dipole.

A suitable insulator can be made from a piece of clear plastic similar to my sketch, **Fig. 3**. You'll perhaps need a clamping plate of the same material to hold the ends of the element. You'll need a further hole for the support rope.

A QRP Multi-Band Dipole

Perhaps, you'd like to operate it as a low-power multi-band antenna. Then cut and prepare two lengths of the wire (cut them a bit longer than you anticipate, to allow for trimming) mount a dipole centre in the middle. Decide how many different dipoles you wish to make and divide that number into the total number of wires at your disposal.

To keep the maths simple enough for me to understand, let's say you want to work on three bands. Then divide the number of wires by the number of bands (26/3 = 8.6 wire). That gives a figure of 3 x 8 wires per dipole with a couple of 'spare' to 'double up on two bands.

Cut the longest dipole down through eight wires, cut the second dipole to a little over length through the next eight wires etc. Each successive dipole will of course be shorter than the last, and you will end up with three dipoles and quite a bit of waste ribbon cable for other projects.

Of course, the more wires you include in one 'bundle the greater current capacity; so if you want eight different dipoles 26/8 = 3 and you will end up with eight dipoles of three wires and one of two wires, and a correspondingly lower current handling capacity.

Sacrificing power handling for versatility, for a 'real QRP' antenna, you can cut each wire to a different length and end up with nine 'band-spread' dipoles, the majority being cut to the top, centre and bottom end of the band.

Be aware, that all these wires in close proximity will inevitably interact with one another. To achieve the best results will involve a fairly tedious process of testing, cutting and re-erecting your antenna in a format which is fairly typical of our operating habits. As you get near to a 'perfect' (let's just settle for acceptable') matching then stop cutting, it's a devil of a job to stick bits of wire back on again and still make it look neat.

I hope this may have given you the seeds of some ideas for your own projects, but do remember, never throw anything away! ●

Fig. 1: Carefully pare back the insulation of all the wires by about 10-12mm and tin the ends.

Fig. 2: Then solder the shaped 'end-piece' (made from heavier plain copper wire) in place.

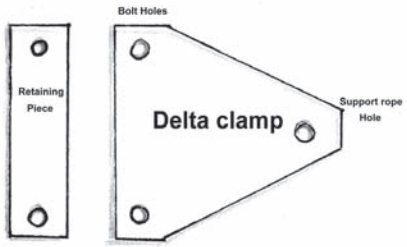

Fig. 3: Roy's sketch of a suitable centre-piece for an antenna for higher power use.

Fig. 4: The end of the NVIS installation, can be held in the 'clamps' of an insulated pole designed for electric fences.