Colin Redwood G6MXL's What Next?
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'No See' Antennas!

In this *What Next?* column Colin Redwood G6MXL, says, hopefully the neighbours will have difficulty spotting your reduced visual impact antennas and looks at the new *PW* archives on CDROM.

Welcome to *What Next?* (*WN?*) where I'm considering that reduced visual impact antennas can be most helpful! Indeed, I suspect most Amateurs at some point will have had a finger pointed at them by family or neighbours in respect of their antenna systems. Others will perhaps have limitations on what they can realistically put up antenna wise.

So this month I'm looking at a number of approaches that can reduce the visual impact of an Amateur station's antenna systems. I should first make the point that the performance of most of the antennas I'm describing is generally less than their more visible alternatives. The location of some of the ideas I will be presenting may limit the maximum power that can be used without causing electromagnetic compatibility (EMC) issues.

Nevertheless, I hope that many readers will find something that will help them get on the air with less visual impact. The article may also provide an idea for an antenna system at an alternative location.

One Antenna – Multiple Bands

The first approach I am going to consider is using one antenna on multiple bands. It is probably the most obvious way of reducing the visual impact of an Amateur Radio station. No doubt many will think of using traps for high frequency (h.f.) antennas. Traps can be put into dipoles (**Fig. 1**), Yagi and even vertical antennas. They also have the advantage of slightly reducing the overall length of the elements of an antenna.

However, traps don't have to be confined to the h.f. bands. Some years ago, Jaybeam used to make a trapped 4-element 50/70MHz (6m/4m) beam.

For very high frequency (v.h.f.) operations, many Amateurs use dual-band 'white stick' poles for the 145 and 433MHz bands. There are designs that cover three bands. I have used a very compact 50/145/433MHz antenna for a number of years **(Fig. 2)**. And in practice I've found the performance on 145 and 433MHz bands to be perfectly satisfactory for participating in my club net and other local contacts.

While there are plenty of 50MHz antennas with better performance, I have found that a tri-band white stick is good enough to make some contacts around Europe and even across the Atlantic using Sporadic-E propagation. As I have said on previous occasions, getting the antenna as high as you can and using low-loss feeder (especially at 145MHz and above) will give best results.

Designs of Yagi antennas with elements that are cut for more than one band, sharing a common boom exist. I found for example that I

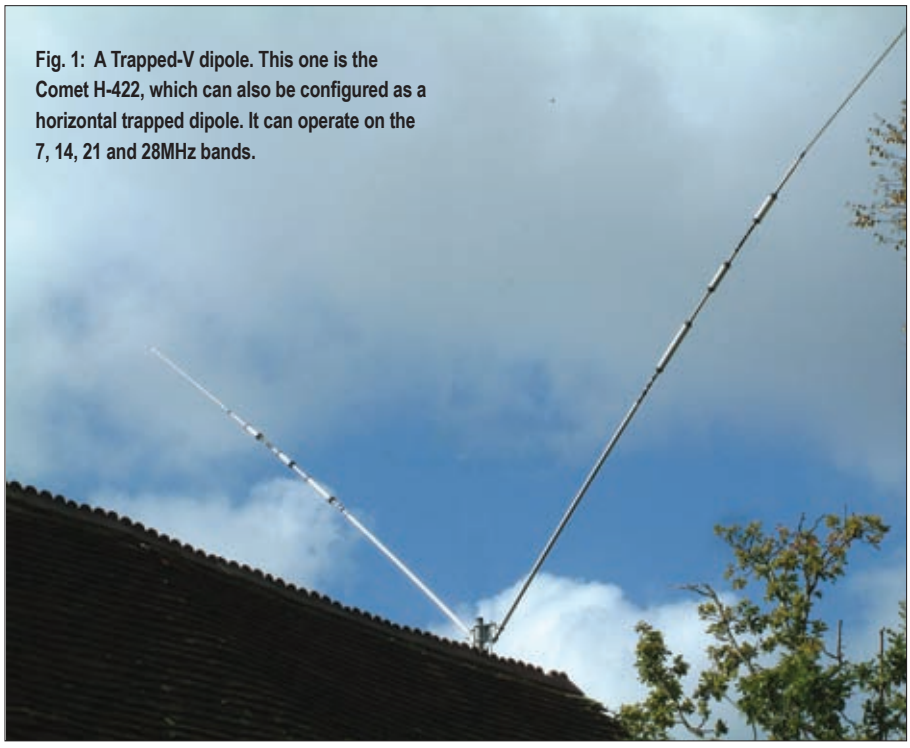

Fig. 1: A Trapped-V dipole. This one is the Comet H-422, which can also be configured as a horizontal trapped dipole. It can operate on the 7, 14, 21 and 28MHz bands.

Fig. 2: A small triple-band (50/145/433MHz) antenna, which is ideal for local contacts. Notice how the support mast has also been used to support the feed-point of a wire antenna saving the visual impact of a second support.

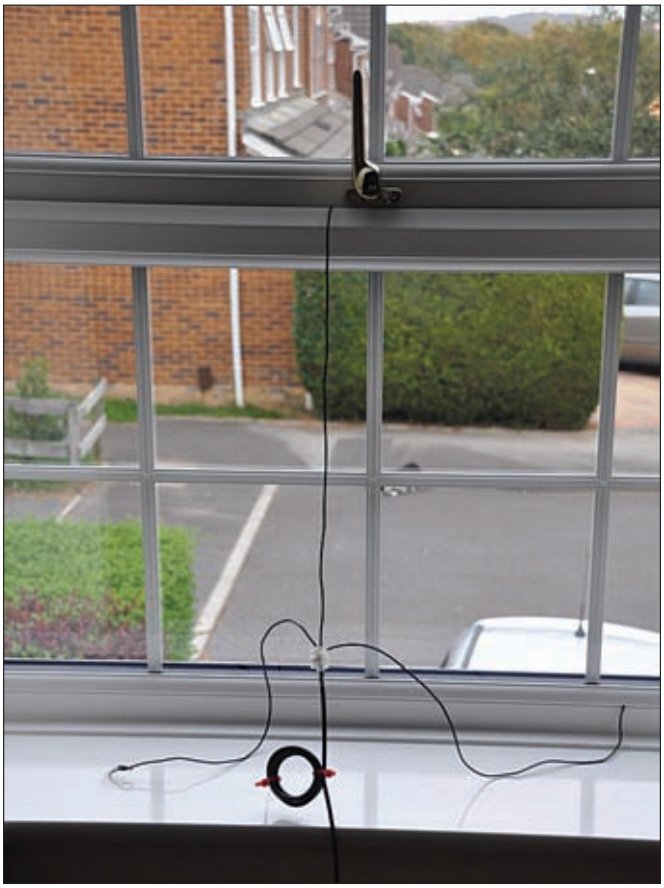

Fig. 3: A simple and cheap ¼-wave antenna for use from an upstairs window.

Fig. 4: Two mobile whips fitted back to back to form a dipole with coils to reduce the dimensions to a fraction of a normal dipole length.

could successfully install a 50MHz dipole onto the boom of a small 3-element Yagi for 70MHz. I suspect that performance may have suffered a little, but for me it meant getting on two bands rather than having to choose between them. This technique can also be used at h.f.

Indoor VHF Antennas

If you are limited to indoor antennas, I can suggest an idea that works quite well and doesn't cost a fortune (**Fig. 3**). Cut three pieces of wire about 480mm long. Next, take a 'chock-block' connector and connect the outer of some coaxial feeder to two of the wires. Then connect the centre of the coaxial cable to the other piece of wire. At the other end of the coaxial cable, fit a connector to suit your transceiver.

Mount the antenna by a window with the centre running vertically, and the two wires from the screen running to either side. Voila – one very simple, cheap and remarkably effective antenna for the 145MHz band! This makes an ideal antenna to take on your travels. It performs better than some flexible whip ('rubber duck') antennas. I see no reason why the design could not be scaled up to give an antenna for 70MHz or perhaps even 50MHz. Likewise it could also be scaled down to give a 433MHz antenna.

Reduced Size Antennas

Another approach to reducing the visual impact of antennas is to reduce their size. Inserting coils into dipole elements can reduce their lengths by a significant margin. Taken to the extreme, it is possible to use two mobile whips screwed into a centre-piece as a dipole (**Fig. 4**).

The same approach can work remarkably well and may enable operation on the 7 and 3.5MHz bands when space would not otherwise permit. Each side of the dipole will need to be carefully adjusted for length on the desired operating frequency on the band in question. I've found this approach can also be quite effective in temporary locations.

Another approach to reducing the size of an antenna is to use a centre-loaded 'sloper' design. This approach was described by **C.D. Peake G0NZI** in the October 2007 issue of *PW* where he described a top band antenna just 7m long!

Another approach is to use 'slinky' or 'springy' coils. This approach was

Fig. 5: A gutter mounted antenna. Changing the wire from black to white would make the antenna less visible, as would applying a little tension to prevent sagging.

described by **John Heys G3BDQ** in his *Antenna Workshop* article in the March 2008 issue of *PW*.

Down Pipes

Most people are pre-disposed to think that plastic gutter down pipes are installed on houses to get rain water from the gutter to the sewers. However, while this is probably the case for most pipes, I see no reason why it's not possible to install an additional down pipe in which to run antenna feeders!

Likewise, it should be possible to install a vertical antenna in a plastic down pipe. As long as the material is of the right colour and size to the rest of the premises, then I suspect this could be made to look very unobtrusive. Obviously – there must be no visible gap at the top or bottom to give the game away.

If you're considering this approach it might be worth trying a piece to see whether it affects the performance adversely, as I recall reading that some types of plastic absorb radio frequency energy. Also ensure that any water that does enter the top can drain away at the bottom.

Plastic Gutters

These days, many homes have plastic gutters. Based on a small sample of round profile gutters that I have looked at closely, I reckon that a wire antenna can be installed either behind or under most of them, depending on the design of the gutter clips. Choosing a plastic covered wire of a similar colour as the gutter should be easy, as most gutters are either white or black (**Fig. 5**).

When I tried the suggested technique, I found it helpful to keep some tension on the wire so that it didn't sag and become visible between clips. By using either a ventilation slot in, or drilling a discrete hole in the soffit board, feeder can be routed into the loft or attic space and then down to the shack.

If you are forced to install antennas surreptitiously, then it pays to do a bit of planning. For example, combining the installation of a gutter or down-pipe antenna with cleaning out the gutter can help disguise the activity from neighbours, as can choosing a time when they are not about (perhaps when they are on holiday). Another approach might be to combine the antenna installation with the outside Christmas lights that have become popular in recent years, and then perhaps leaving them up all year round.

Fig. 6a: Feeder partially concealed behind a plastic downpipe. The black feeder used here illustrates the idea.

Fig. 6b: Using white feeder has helped hide the feeder still more – an even better idea would be to use matching cable ties!

Feeder Routing

Careful routing of feeder can help minimise the visual impact of an antenna system. Clipping feeder to a wall behind a gutter down pipe, or even cable-tying it to the down pipe can minimise the visual impact. Again, simple things like the colour of the feeder, cable clips and cable ties, can make all the difference (**Fig 6**).

Tip: Did you know that it is possible to buy RG58 feeder with a white sleeve instead of the usual black? Used with the common white plastic down pipes and white or transparent cable ties, you could be well on the way to making your feeder much less visible than it might otherwise have been. An alternative approach to disguising the feeder is to thread it through cable sleeve of a suitable diameter and colour – making sure that you seal the top end to stop water ingress using self-amalgamating tape.

A Mobile Station?

If operating from home is really out of the question, perhaps you can install a station in your car and operate either in the drive or when parked elsewhere. There are two reasons why I would suggest that Amateurs avoid operating whilst actually moving. Firstly, the laws concerning driving without due car and attention and secondly many cars have so much electronics in them that they may be affected by strong radio signals from an installation so close by.

Back Numbers OF *PW* On CD

As I was preparing this article, I was looking back through several years of *PW*s to find some specific articles I wanted to refer to. I was amazed how much easier it was to find the articles I wanted when they were in 2010. Why? Quite simply I have purchased the *PW* Back Numbers for 2010 on a CDROM.

Now, instead of having to find the December issue 2010 (which I had misplaced) and then the index within it, and then find the issue and the specific article within the issue that I needed to refer to, I could simply look it all up on a single CD! But perhaps the biggest bonus is not having to re-file all the issues that I had extracted from archive boxes!

I found the CD really easy to use on my PC running *Windows XP SP3*. Each issue is absolutely complete from cover to cover on a separate '.pdf' file. This means that I can now free up some valuable shelf space. I am looking forward to welcoming further back-numbers on CD so that I can clear even more shelf space!

Updates to RSGB Books

From time to time, the **Radio Society of Great Britain** (RSGB) make updates to their training manuals and other books. Sometimes these are corrections, and sometimes the updates reflect minor changes to the syllabus or improvements. The updates can be found at **http://www.rsgb.org/books/extra/**

For training, I recommend purchasing the latest edition of the relevant book a few weeks before starting a course. If you have a previous edition, the updates can be quite helpful in bringing a previous edition up-to-date.

Readers' Antennas

I would be really pleased to feature some readers' low profile antennas in a future What Next column. I look forward to hearing from you very soon!

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