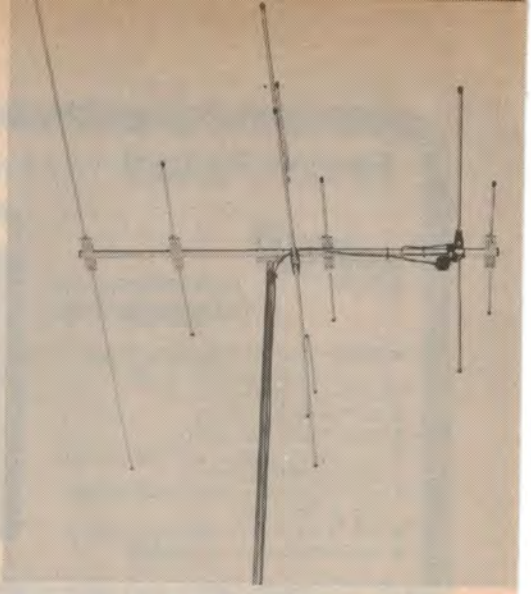
It cost you money, so...

Take care of your TV/FM antenna



In the interest of signal pickup, a television antenna should be mounted well out in the clear. But, in such a position, it is exposed to wind, salt spray perhaps, and large birds. The Author, an expert in the field, talks about possible deterioration, and damage to TV antennas.

by W. J. (Bill) McMANUS*

Corrosion, or oxidisation, is one of the main enemies of a TV/FM antenna installation but it is one that depends a great deal on the particular location.

In the dry Australian interior, a piece of steel without special protective coating may last for years without showing signs of destructive corrosion. On the other hand, corrosion is a very real problem in coastal regions, such that all hardware that is used to support the antenna should be hot-dipped galvanised.

Nuts and bolts need to be zinc or cadmium plated – a treatment that offers protection without affecting the thread. They could be galvanised but a die nut would have to be run over the thread and this would cut the coating off and leave bare metal again.

Brass bolts are out of the question because of the electrolysis effect that would set up immediately with the galvanising, leading to chemical corrosion.

Aluminium nuts and bolts are less prone to electrolysis but they lack the strength of the harder metals.

Stainless steel hardware is both strong and virtually corrosion-free but the cost will deter most ordinary consumers.

Fortunately, the life of antenna support hardware can be prolonged in badly affected salt areas by first treating it with a metal primer and then coating it with a good quality weather-resistant paint.

The antenna itself is normally less of a problem. Being constructed mainly or wholly of aluminium, there is no spontaneous galvanic action between the various components. Other reasons for using aluminium include:

- Its light weight, especially when large arrays have to be installed at a considerable height in fringe areas. Apart from problems of handling, weight imposes demands on the supporting structure.
- The electrical conducting properties of aluminium are good.
- Aluminium has good anti-corrosion properties, even in a coastal environment.

After aluminium has been exposed to the weather for some time, its skin hardens to produce a coating not unlike anodising, thus acting as a form of self-protection. However, when subjected to direct salt-spray (eg within 100 metres or so of the water's edge) severe deterioration can still occur.

Coating the antenna with protective lacquers etc, can slow down this action a little but it has to be done correctly. Ordinary metal primers do not take well to aluminium. It has to be etch-primed, undercoated, and a special aluminium paint applied.

Care has to be taken not to paint the insulators and connections. These are best treated with a rubberised compound laid on liberally to keep the salt water etc away from the connections by sealing them over.

All stainless steel antennas can be used in coastal situations but, again, the cost is high.

As distinct from corrosion problems, medium to large birds can pose a constant hazard both inland and on the coast. Cockatoos and galahs have been known to chew the insulators away on an antenna in inland situations and, on the coast, large water birds such as pelicans have used television antennas as a spotting position for fish, if situated close to an estuary.

Unfortunately, an antenna constructed strongly enough to withstand the stress of a pelican landing and taking off again would be just too heavy and too costly to market. However, an idea that offers some protection is to provide the birds with an alternate perch, which can be in the form of a "T" bar arrangement that projects above the antenna (at least a half wavelength so it won't interfere with the electrical performance). With a stronger and larger horizontal section on top, the larger birds favour sitting there rather than on the thinner elements.

Probably the worst enemy of a large TV/FM antenna installation is gale-force wind. In theory, an antenna could be constructed that would withstand anything that the elements might throw at it but, as mentioned earlier, it gets down to matters of weight and cost. Even so, given sufficient thought and care, a normal system can be installed so as to stand up to anything short of a typhoon!

The main reasons why antennas blow down are as follows:

1. The guying angle is too acute to give proper support to the mast. There are calculations that can be carried out for wind loading on the antenna and supporting mast etc but it is outside the

"And that guy wire thing just happened to get caught in the bumper bar!"

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scope of this article to go into them. A good rule of thumb is never to install the guying points closer than a third of the height of the masts. If you are going up 15 metres your guying points should be five metres or more from the foot of the mast; the wider the better, within reason.

2. Improperly placed guys. Aim to install four sets of guys, arranged 90° apart.

3. An unsupported top section carrying the antenna itself. A special collar on all High-Q masts allow an extra set of guys to be installed right up underneath the antenna.

4. Insecure anchor points. Use eye bolts wherever possible, locked in position with a washer and nut. Failing eye bolts, and the need to use a guying cleat, use coach screws. Above all, don't count on the fascia board of an old dwelling; it may be quite insecure.

5. Corroded and weakened guy wires, eye bolts, turnbuckles, etc. They should be checked every two or three years.

As there is such a wide variety of situations encountered when installing television antennas, there is no set rule of how each one should be approached. A lot of initiative and common sense, has to be used.

One only has to glance at some installations to get the impression that they are not safe. Examples are on the roof of a gunbarrell type house; or on the ground with the fence too close to the dwelling. In both cases the guying angle is such as to impose too much down-thrust on the mast. This may cause it to buckle, usually between the upper guy rings.

Standards have been published concerning such matters but, if these are not to hand, let common sense be your guide. Don't go for greater antenna height, in search of a better picture, if you can't provide adequate guying. And don't forget that wind gusts can be stronger in some situations than others.

CLIMBING THE MAST?

One final point: to save time and expense a professional antenna man may opt to climb an existing installation to check for a broken lead or install a masthead amplifier. He has experience and maybe equipment on his side, so don't be tempted to follow suit out of sheer bravado.

But, if you're determined to copy the expert, first carefully check all guy wires and all anchor points; and make sure that there is enough of them to cope with the extra stress.

Check the mast sections carefully as you progress. They tend to rust from the inside, leaving only the galvanised shell.

Believe it or not, I have known an installer to poke a screwdriver straight through an apparently solid looking metal mast. That would be one case, for certain, where care paid dividends!