THE WICKED WINCH OF THE EAST

By Ian Jackson VK3BUF

Recently several members of the GGREC purchased new brake-winches to replace the basic winch assemblies on their radio towers. Most of these were for the two-stage, tiltover 'Nally' radio towers which use two winches. 'Why do this' you may ask? Or more to the point, if you *don't* ask, then there's no reason to read this article.

The Original winch assemblies on the Nally towers were a very basic 1:1 ratio pawl & ratchet assembly. Pretty much like what you would see on the village well in an African *Foreign Correspondent* documentary. When you wind it up you get a clack-clack of the pawl riding over the ratchet. If you let go of the handle, the pawl locks into the ratchet and the winch cable remains in a safe state. All sweet if you are winching 'up' the mast (or bucket). The fun starts when the tower is being lowered, (it's ok to stop thinking about buckets now) because you must use one hand to hold the safety pawl back, while unwinding the winch handle with only one hand. This can be very heavy indeed. If your one hand should slip from the handle during this process, you have a runaway tower. The top stage drops like a pile driver, the handle spins out of control, breaking whatever bones it can. When the tower bottoms out, your multi-hundred dollar antenna rotator crumples like a Styrofoam burger container under the front tyre of a Hummer (with the burger still inside!). Approximately 2.7 seconds later the sky rains aluminium from what was your antenna system. There are words that would be spoken following this chain of events which gentle ears should not hear and my spellchecker cannot deal with. Fortunately this has not happened to me, but it is a spectre that does haunt us all.

There is a solution. Enter the 'Brake Winch! (insert mental image here of a hand whisking away a violet silken handkerchief from something on a pedestal that could be a brake winch) The popular *brake winch* has two advantages. Firstly, it usually has a gear reduction which makes it easier to wind up and down. You will no longer need that well oiled and bare-chested rower from a Cleopatran river barge to crank the tower for you. (unless of course you enjoy having him around) Secondly it has an inertial brake. You can un-wind the winch safely and let go at any time without dire repercussions.

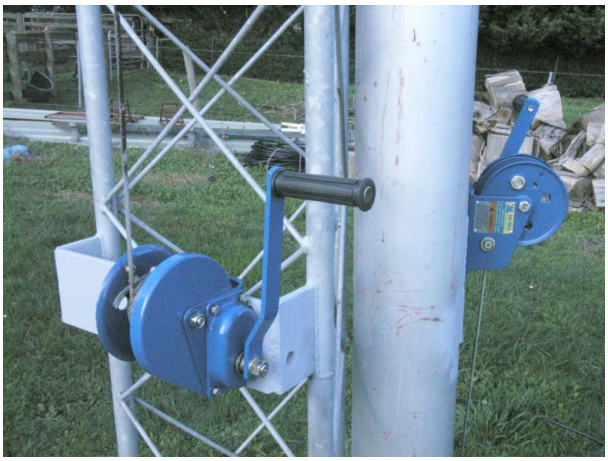
Now we get to the good bit. First buy your winches. You will need a winch in the 260 to 300kg range like the Jarrett F18230 brake winch, or the Rig-mate BRWH270 from Nobles rigging supplies in Dandenong. They are around $80-$90 each. Many of the GGREC members purchased the 500kg BRWHB500 version which is a larger, heavier winch. After some experiments with both winches, I preferred the smaller BRWH270 because of the shorter winch handle which did not clash with the tower and better cable departure angle from the spool.

The first stage was to secure the tower, un-wind all the cable from the old drum and grind off the old winch assembly. The second stage was to drill the 10mm holes in the steel adapter plates. These plates were standard 110 x 10mm flat stock cut to size by a local steel merchant. It was much easier to pre-drill the plates in the drill press than to do it on the pole. The plates were then welded into position, tidied up with a grinder and sprayed with undercoat. The plate was 400mm long for the vertical lift winch and 150mm long for the tiltover winch. The vertical welds can be a bit of fun to get right, but remember that the worst welding job will still be better than the best duct-tape and garden twine job you can do.

To prevent unwanted angst and loss of enjoyment to life, I highly recommend not wearing your favourite polyester house slippers during the grinding and welding phases. Of course you will then loose a great talking point around the coffee table when your guests ask why your white socks can be seen in a kind of reverse-Dalmatian style through your dark blue slippers. (Before you know it department stores will want to sell pre-welded slippers alongside their pre-washed, pre-holed denim products. Be a trendsetter!)

When attaching the winches to the plates, use 10mm x 30mm stainless bolts, with matching washers and nuts. The stainless bolts have a higher tensile strength than equivalent mild steel ones, and of course

they will not rust. The difference in cost is minimal. In fact, check the integrity of your winch cable during this upgrade. Remember the mantra: If it's brown, tear it down. If it's clear, have no fear. On my tower I found some corrosion on the tiltover cable where it passed through the lower pulley. I replaced it with some 6mm dia stainless cable and stainless wire rope clamps.



To keep the winches looking pretty, you may want to cover them with a bag or something. On the vertical lift winch, tie a bit of rope or scrap cable around the wire above the cover, so that when the water runs down the vertical cable, it will drip off the scrap wire before entering the cover and wetting the cable on the reel all the time.

I usually use a counterweight on the rear of the tower to make life a bit easier. It is a slab of steel with a removable mounting hook. With the weight in place a three year old kid could work the winch. Mind you, that same three year old may find it awkward to drag the 60 kilo slab of steel into position, and he would also need a decent box to stand on to reach the handle, but all of these difficulties could be overcome with a little thought.

In the adjacent pic Dianne VK3JDI is working the winch with ease. A bit of the 20M 4 element monobander can be seen in the background. Also present is a very small cow, which appears to be trying hard to avoiding being crushed by the counterweight.

For the experiment I tried tilting the tower over *without* the counterweight and it did this with ease. Maximum strain was well within the winch specs and it held the load easily. The 5:1 gear reduction makes quite a difference to managing the load.

It is a good thing that the new winches can be operated quickly, because while the tower is tilted, my antenna for the wireless broadband internet antenna points to the ground, instead of to the base 5km away. Hence a couple of teenage kids have to entertain themselves while the tower is being serviced.

Also visible at the base of the tower are some 90mm, 45º pvc bends where all the coax cables enter the tower slab. They all come up through the concrete floor of the house some metres away. The 3 bends keep water out of the conduit, but can be pulled apart if the need arises to add more cables in the future.

Well, that's it…Time to wind up this article. (or down as the case may be) Replacing a winch may seem like (and possibly is) a fairly nerdy way to spend a weekend, but if you make it easier to access your antennas, then you're more likely to experiment with them. Also, on a stormy night you can ring up your loved ones from the hotel bar and get them to crank your antenna down for you - the ultimate test of a relationship.
