Amateur Radio to the Rescue

The story of an antenna

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I worked for the Council for Scientific and Industrial Research, CSIR, as an electronics technician most of my working life and in the early sixties I was based in Durban, South Africa, where we did oceanographic research. We used a variety of boats and ships until the CSIR decided that we should have our own research vessel which would be built to our requirements. And so the Research Vessel Meiring Naudé was built. It was named after the then president of the CSIR.

The Meiring Naudé was not big, about 300 tons, 32 metres long and with a crew of five officers and engineers, and eight sailors. There were four double cabins for scientific staff and well fitted out laboratories.

Then in about 1975 television was introduced in this country and the crew of the Meiring Naudé decided that they would like to have TV as well. Funds were allocated for it and someone contacted a commercial company in Durban to install TV on board, one set in the sailors' quarters and one in the area used by the officers and scientists.

And so the installation took place, two colour TV's and a Yagi antenna at a high position above the bridge and a preamp and splitter in line.

Everybody was satisfied with the good quality image until the ship left harbour…..
No one had taken into account that the antenna would no longer be pointing at the nearest transmitter, and of course the good signal dissappeared.

The workshops at the CSIR were then asked to make a rotator system, and in due course a small box appeared next to the TV with a switch to rotate the antenna towards the nearest signal. This worked fairly well until the mechanism corroded and seized up! Someone freed it up and tied a rope tot the front of the Yagi antenna and the antenna was then rotated by hand, sometimes at night and under stormy conditions.

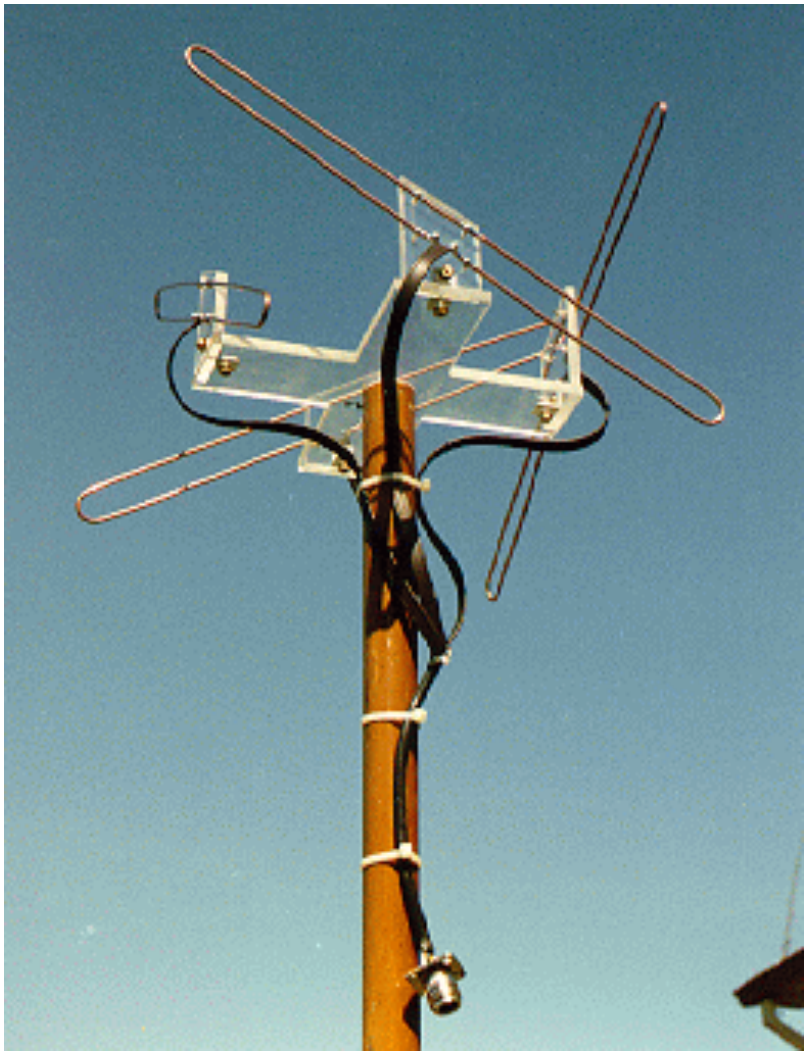
As can be expected, the crew complained loud and long until their laments reached the ears of the bosses.

And so one day a message landed on my desk: Just three words, "Make it work!"

I was a radio amateur at the time and had been experimenting with satellite reception and had purchased the ARRL's Satellite Experimenters Handbook not long before and had read it from cover to cover. So I knew about polarisation and that a linearly polarised signal could be received by a circularly polarised antenna with just 3dB loss.

I did some research and found thet there were seven TV transmitters around the South African coastline, four being horizontally polarised, and three vertically polarised. So a

TV antenna for the Meiring Naudé would have to be omnidirectional and capable of receiving both horizontally and vertically polarised signals. I decided that a circularly polarised antenna would do the job, and there was just the right thing in the Satellite Experimenters Handbook. It was called a Lindenblad antenna. Here is an example of one:



This antenna consists of four folded dipoles mounted on four sides of a square and each antenna tilted 30 degrees from the horizontal. They were fed by 300 Ohm feedline all connected in parallel to give 75 Ohms, just right for the TV receivers.

I asked the workshops to make the antennas from 10mm stainless steel tubing with the connection points silver soldered so that the feedlines could be soldered on. The woodwork specialist in the workshops made a box like structure from marine plywood with a liberal coating of fibreglass to keep water out.

The antenna was installed with the preamp still in line to compensate for the 3dB loss due to polarisation effects.

The antenna worked brillantly! Even at about 200 nautical miles from the coast we could still watch TV, the signal would be snowy but steady and still watchable. There was no fading and the ship could cruise in any direction without loss of signal.