

DREAM OR NIGHTMARE:

A REPEATER FOR SOUTHERN TASMANIA

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Hobart, the capital city of Tasmania, nestles snugly beneath the 4,000-odd foot Mt. Wellington. Since the earliest days of amateur radio, Hobartians have looked fondly at that mighty magnificence and swooned at the thought of a VHF site to end all sites. Thus as equipment became more and more portable, mountain topping DX-peditions became regular events and results invariably justified the trouble.

Then one day a new word came into the language — Repeater. Those eyes which were growing dim from many years of covetous glances at the mountain top, began to dream of a repeater to perpetuate their dreams and ambitions. 1970 came and construction of a repeater was commenced. The initial work was carried out by Ron VK7ZRO and Dave VK7MD. By the middle of 1970 a repeater was in existence except for a bug free keyer, antennae and a site. The equipment was comprised of a 1674 transmitter exciter board into a low power final delivering 25 watts of power; the receiver a modified Ranger 800 2 with 6CW4 front end. As a unit this repeater was used on a manned basis for a short while, but increasing commitments necessitated a change in repeater committee.

The 'Northerners' by this time (to the uninitiated, the northern branch of the Division) had been causing strange splutters to appear "a bit above channel A" and suddenly there was a licensed repeater in Tasmania and the Southerners had been beaten to the punch. However, not to be outdone, the Southern repeater under a new committee, finally managed to ascend the mountain two years later. Antennae were erected on the commercial television tower and initial tests were commenced. However, all was not as it should be. Spies in the north of the State were sent out to give signal reports. Comparisons between the repeater and a mobile some 100' below showed a notable difference — the mobile could be heard the repeater could not!

Faced with this result, the committee carefully stored the repeater in a corner of the building and repaired to warmer climes. It was obvious that a rethink was necessary. Was the lo-loss cable not so lo? Was the transmit power too low? Were the antennae unsuitable? Time passed and the repeater was forgotten until one day came news of a fire on the mountain. The damage was not severe but a decree was issued by the owners of the building that no valve equipment was to henceforth be stored therein. The repeater story that had never started, had just ended.

Another committee was formed to build

a solid state repeater. Enthusiasm was not high and an air of gloom and dismay pervaded the project. The receiver was unstable, the exciter was too broad, the final was temperamental and to make matters worse two members of the committee were newly married! The operation was again at a standstill but this did not deter the old eyes from still casting covetous glances at the mountain top from time to time.

Towards the end of 1975 it was realised that a local amateur who also was an employee of Telecom, was the engineer responsible for antennae and cables etc. on the National TV tower on the mountain. Thus the question was cautiously born, "What about moving the valve repeater". But where was it? After much careful looking, a piece of coaxial cable was found protruding from a dark corner and at the other end was the device, very

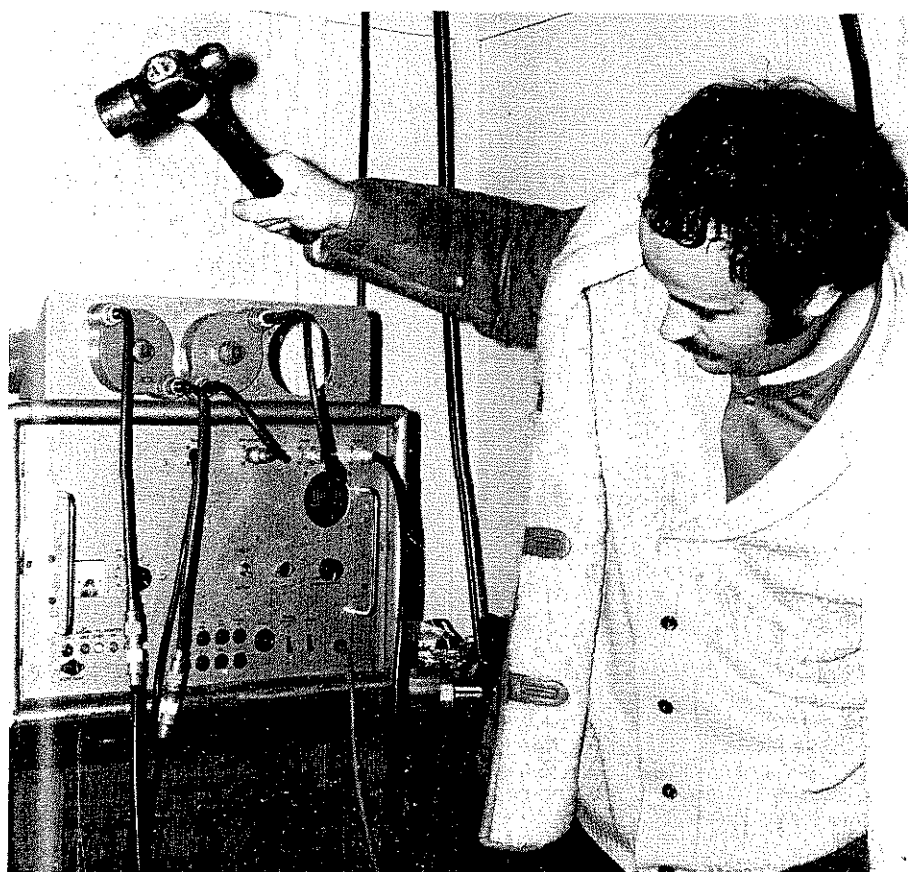
dusty and abandoned but still in one piece.

Some two years after first ascending the mountain, the repeater was brought back to sea level having had less than one hour's use. The first step was to build a reliable keyer. This presented no problem to one of our engineer amateurs VK7AW, who in a short space of time had a very satisfactory little man working away on MCW from inside a small die-cast box. The repeater was plugged in and turned on. Nothing. In case the shock had been too much the process was repeated with the same result. A careful inspection of the innards revealed that the transmitter was OK but the receiver was the perfect attenuator. Not having any need for such a good attenuator, it was pulled out and work commenced on fixing it. Hours and hours later, after countless cups of black coffee it again



Inspecting the aerials of VK7RHT.

Photos: B. J. Morgan and W. T. Moffat VK7TM



Final tweak before going into service.

emitted noise. But what sensitivity? When cold it was giving 20 dB quieting at 1 microvolt, as it warmed up this decreased to a miserable 5 microvolts.

The repeater was set up for evaluating performance, for a 1 month test period from a 1000' elevation, at an amateur's residence. This gave time for consideration of antennae at the new site and a modern receiver. The month passed and unfortunately we were no further advanced. A rebuild of the transmitter final had been considered desirable and at the same time the power output was raised to 75 watts. An STC 131 receiver was considered a very good basis for a new repeater receiver and at no cost one was obtained and modifications carried out. It was heartening when, after many long and sleepless nights spent huddled over benches and FET's, the receiver was giving 20 dB of quieting at 0.35 microvolts. Maybe the repeater might work well after all. The committee at this stage consisted of four. Phil VK7SS was responsible for antennae. Andrew VK7AW for the keyer and timing circuitry, Tom VK7TM and Brian VK7RR for the transmitter and receiver.

Then came the big test. Towards the end of April antennae were erected under the 90' platform of the National TV tower. There were two existing runs of lo-loss cable that were surplus to requirements and these were obtained on loan. When connected it was obvious that either one cable or one antenna was faulty. By

swapping cables from antenna to antenna the fault was traced to one of the cables. Next job — fix the cable.

Saturday, May 8th was C day. Bright and early at 6.45 a.m. Brian and Tom met and started off for the mountain top, Andrew and Phil followed. The weather was against us and it was impossible to do any work. It was agreed that, subject to the weather improving, the repairs would be started the next day. However, whilst the weather was satisfactory, we had forgotten Mother's Day and so the work was called off again.

During the following week, with the assistance of some amateurs who were also authorised tower climbers, one antenna was raised to the 232 ft. platform and a cable run was taken up from the 90 ft. level to the top antenna. It was realised that time was working against us because of the risk of deteriorating weather. Several weeks were spent in tracing out the faulty cable and trying to repair it. Ultimately it was discovered that the cable was completely full of water and was beyond repair. After much discussion and a meeting of interested parties, it was agreed to purchase new lo-loss cable at a price of approximately \$300.00. On the 29th of May this cable was run in the most appalling and rapidly deteriorating weather conditions. However, everything was completed and then came the big moment.

But to digress for a moment, Brian and Tom had decided to run the repeater transmitter on a temporary aerial at ground

level for the week whilst we were waiting for the new cable. Some of the lightest moments in the saga came whilst users (not knowing that we were not using the proper antennae) sat in the city, gazed up at the tower and expressed all sorts of theories about why signals were noisy even where they could see the tower. It was fortunate that the inventor of co-axial verticals did not have to endure the criticisms of angle of radiation, etc., whilst the unenlightened discussed the faults of the antenna at length. Returning to the now completed cable run, the truth about the aerials was revealed and the two tower antennae were connected, the power output was increased to its nominal 75 watts and the big switch was turned on. We then sat waiting for reports. We were not long in waiting. In the first few hours, reports came in from over 100 miles away, from a hand held unit some 60 miles away and from mobiles 50-70 miles away. As a start then the repeater was working and very well at that.

After two weeks of air testing the equipment is still being run by virtue of an operating permit to enable interference problems, etc., to be dealt with, if and when they appear. To date there has been nothing untoward occur. We have been advised that channel Two (new band plan) has been confirmed as our operating channel and the call sign VK7RHT will soon be granted.

This story in reading does not adequately relate the problems experienced in setting up a repeater on a "congested" mountain top. Whilst we did not need to purchase or erect towers, etc., we had to counter any possible intermodulation faults caused with commercial services in the vicinity, ensure minimum cable loss (the run to each antenna is a minimum of 350 ft.), engage the voluntary services of qualified and medically suitable riggers to carry out the installation and connection of the antennae and cables and perhaps most of all, to work in sub-zero temperatures amidst ice and snow, gale force winds and driving rain, all taking their turn to hinder the workers.

Sequel. The repeater has already shown itself to be the realisation of a life's dream for those intrepid pioneers of the mountain-top gazing. Perhaps not surprisingly it has attracted many old timers to 2 metres. The success of the project already can be gauged when, in a conversation recently, two OTs new aspirants to 2 metres were both trying out their multi-channel mobiles. One suggested they go to 3,590 and the reply was, "Which channel is that on this rig?"

Equipment TX : TCA 1674 + QQE06/40 final, 75 watts out —

Receiver: STC 131 modified front end with MPF 1000 and helical resonators.

Cable: Andrews FHJ114 foam filled, HM9 air pressurised.

Antennae: Home built, stainless steel co-axial verticals, sealed in polyurethane compound and fibreglass.

Timer and Keyer: Home-brew using ICs.