By Mike Kerr, ZL2BCW

The Quartz Hill Story

What would you say if offered the chance to restore and operate from a unique, remote, history-laden radio site that sprouts Voice of America-size Vs and rhombics by the dozen? Although their future use of the site is in question, this dedicated group of ZL hams voiced a resounding "yes!"

Quartz Hill is the name of a small hill 974 feet above mean sea level in the southwest corner of the North Island of New Zealand that overlooks Cook Strait in an area named Makara, some 25 miles from Wellington city. The hill is located on an ancient elevated plain that is heavily eroded in parts, with an average height of about 800 feet. This plain is mostly covered in grass, with many outcrops of quartz, which also forms a large part of the underlying strata and traps rain water, causing the ground to be boggy in some places. Gold mining was popular here in the last century.

Although only 30 minutes by car from the center of Wellington, New Zealand's capital city, Makara is sparsely populated and almost free of high-voltage transmission lines. It's also far from major roads, population centers and suffers relatively few electrical storms. Ambient electrical noise levels are extremely low—so low that two separate MF/HF receiving stations were built at this isolated spot in 1944, one to receive overseas shortwave news services at Quartz Hill itself, and another for fixed and maritime services.

But times change. Satellite and international cable links spelled the end of MF/HF for services such as point-to-point fixed links, maritime mobile, news gathering and re-broadcasting and so on. The facility for fixed and maritime services was closed down completely and its antennas removed. The Quartz Hill installation was poised to suffer the same fate.

Wellington Amateur Radio Club

For much of its 72-year history, the club has met in rooms rented or made available just for meetings, so there was no permanent club radio station. In 1995, club members began searching for a permanent, practical club station.

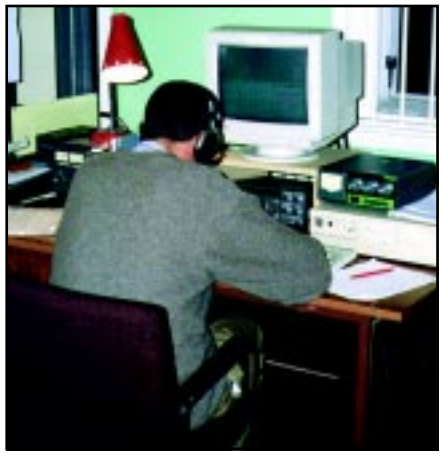
What appear to be telephone poles are actually supports for the feed line to the rhombic antenna. *Title photo:* The station building at Quartz Hill.

Nearly a year went by before a chance meeting between Brian Miller, ZL1AZE, and Bob Stewart, ZL2AMI, led to the discovery that the MF/HF receiving facility at Quartz Hill was being closed down and the site sold off. The club's executive committee agreed that this "news" should be pursued on the chance that the club could make some use of the site. Brian, ZL1AZE, took up the task.

Brian quickly discovered that the site was being sold to a power utility company "as is" for possible future use as an electric generator "wind farm." He then lodged a draft proposal with the new owners on behalf of the club, offering to manage the site until it was required for the wind farm. In return, the club would be allowed to use the station building and the antenna farm, provided that the antennas and the building were kept in a safe and tidy condition. All this took place from mid-October to early November 1996.

Things were moving quickly! The next task was to sell the idea to the club's full membership. The site was of no use for ordinary club meetings because it was well out of town with "country road" access—but we could certainly use those lovely, big antennas!

"Pole 6" at Quartz Hill.



Mike Woods, ZL1AXG, at the operating position.

Some of the 60 or so members endorsed the idea enthusiastically, while others were just as strongly against it. It was truly a daunting task for a small club with many older members. How much would it cost? And could we afford it? Did we have enough active bodies to tackle the physical work that had to be done—and could we keep up the effort?

A majority emerged in favor of taking up the opportunity. Members felt that this was a unique chance to "own" a large antenna farm on a scale beyond the wildest fantasies of any individual ZL—even if only for a relatively short time. Who has not dreamed of taller masts, longer wires and higher-gain beams for every band aimed toward every major point on the compass? Other radio clubs might want to share the facility, too.

After the initial proposal to the site's new owners, the Club followed up with a revised proposal a few weeks later. To our delight, the owners were more than happy with the ideas we presented, and access to the site was gained in January 1997. Urgent maintenance work was the order of the day, pending the drafting of a formal lease. By February 1997, the Club had formally decided to go ahead, turned itself into an Incorporated Society—a necessary step for legal and insurance reasons—signed a three-year "peppercorn" lease with the owners and started rejuvenating the antenna farm and the building. All of this had taken less than five months.

The Prize

So what did we get for our efforts? The antenna farm covered about 240 acres. It contained several reversible rhombics, mostly in a poor condition, a bunch of terminated **V** beams with leg lengths of up to 900 feet, a Beverage antenna that had seen better days and miles of open-wire feeders. The open-wire feeder runs, supported on 20-foot telegraph poles, came back to gantries on each side of the station compound. At the gantries, the feeders were terminated in baluns and connected to the antenna termination room in the station building via underground runs of coax.

The 2000-square-foot station building was generally sound, with lots of room, including a bathroom, a kitchen, a storage room and a workshop. It was equipped with its own 13,000-gallon water tank, a sewerage system and three-phase power fed from an underground cable that had been buried to help maintain low electrical noise levels. The building needed major cleaning and all kinds of minor maintenance, plumbing, lighting, fittings and so forth. The site also contained a lot of technical debris left behind by the previous owners. Even for hams, this was a challenge.

At Quartz Hill, the isolation and the relatively harsh environment of frequent, very strong, cold winds, occasional ground-level clouds, an exposed and elevated site and proximity to the sea, meant corrosion and damp air would be an ongoing battle inside and outside the station building. The main antenna poles, however, were more than three times as high as the ones most of us had at home—and there were lots of them. Plus, the ambient noise level barely moved the S-meter on *any* band. On a fine calm day, the view of Cook Strait, separating the northern and southern islands of New Zealand, was magnificent.

Brian Miller, ZL1AZE, making a few repairs to the lower end of the sloping V antenna.

The antenna terminal room.

The land underneath the antennas is leased to a farmer who has numerous sheep and cattle as part of an ongoing farming operation, so the livestock had to be safe from the antennas, and vice versa. Some of us were fairly keen to be safe from livestock, too! The bulls are very large!

The Work

There was nothing left but to get on with it. The top priority was to make the antenna farm safe by recovering fallen wire, replacing any mast stays that were corroded or

damaged, and recovering any reusable hardware from the fields. Then work began on identifying, testing and marking the feeder runs and building new high-power terminations and baluns to replace the receiving-only types. Inside, workers cleaned the building, fixed the plumbing and cleared the cable ducts of hibernating possums.

Nobody in the club knew much about rigging antennas on the scale we faced at Quartz Hill. Handling 8- or 10-gauge copper wire (soft-drawn for the feeders and hard-drawn for antennas) was a challenge, especially when lengths reached several hundred feet. The stranded galvanized wire used for guying the larger poles was a lot heavier than most of us were used to. Nevertheless, many lengths were cut and tied off to insulators, thimbles and eyebolts, and tensioned without any accidents to ourselves, the poles or the livestock.

By April of 1997, the urgent maintenance work was completed and it was time to celebrate. An official opening day was held on the afternoon of April 25. Although the weather was wet and the site shrouded in clouds, more than 60 people turned out to visit the station, peer through the mist at feeders disappearing into the distance and admire the 70-foot poles close by the station building. A special "1944-era" afternoon tea was served to amateurs, friends and ex-station staffers. An inaugural QSO was conducted on 80 meters with Jim Meachem, ZL2BHF, in Auckland—using our massive rhombic, of course! We were up and running.

Site Development

Once the site had been made safe, the best antennas repaired and the building cleaned up, the next task was installing new antennas to suit our needs as hams. Andrew, ZL2BBJ, started building new 50- to 600-Ω transmitting baluns and Bob, ZL2CA, began modeling the various antenna configurations that had survived and any new antennas that were being considered. The usually calm discussions about what might be best raged on. Everyone had opinions, but there were more mundane problems.

Building new antennas was physically demanding, partly because vehicle access to some parts of the antenna farm was difficult or impossible. This meant that some poles had to be manhandled into position. Feeder poles weren't too hard, but wooden poles longer than 30 feet required gear we didn't have. The sensible approach was to weigh the most desirable antenna options against the 14 existing major masts and other hardware to come up with the best solution. Because we had become accustomed to raising and lowering wires in excess of 900 feet in length, sloping, unterminated **V** beams generally won hands down.

The antenna farm schematic illustrates the result. We wanted separate feeders to each antenna so we could operate from at least three simultaneous positions in the station building. A simple antenna patch panel in the termination room allowed any antenna to be routed to any of three operating positions. It also avoided placing switching gear outside, which would have increased maintenance problems dramatically. The exception to this rule is the rhombic, which has its reversing switch remotely controlled by a dc signal sent through its 600-Ω feeders.

Results

So, what happens when you finally sit down, tune up on the rhombic (short path on 20 meters to Europe) and take a listen? First, everything seems quiet—too quiet. It *is* quiet, and there's very little ambient radio noise. You anxiously wonder if you've selected the right antenna. A signal is heard, but it doesn't seem all that loud. Even 12 dB of antenna gain doesn't do much good if propagation is poor. It's easy to forget that at home, perhaps, you wouldn't hear anything. Gradually, you discover that the beams *do* work, and that the big antennas produce consistently good signals in and out. Call CQ on any band and stations appear out of nowhere.

Do this at the right time on 80 meters and you may generate a DX pileup (instead of perhaps one QSO from your home station). If necessary, you can select long path or short path directions on 80 through 10 meters.

Some hams who are unable to operate from their home shacks operate from "up the hill" whenever they can. Others go there to work particular skeds with old friends around the world. An ad hoc group of contest enthusiasts competes in selected events. A special call sign, ZL6QH, fans the flames in the pileups. QRP operators try out their few watts on the big antennas. The NZ Vintage Radio Society occasionally takes some of its prized treasures up there to try out the old radios and experience the booming signals as though the rigs were made only yesterday. Some other local radio clubs have also joined in.

Still others find that once they've have had the satisfaction of actually having a huge rhombic or **V** beam all to themselves, it doesn't matter so much anymore and they're happy to go back to their home stations and operate as before.

The isolated and rugged site has a spell all its own. Some members of the Quartz Hill User's Group (Q-HUG) find working out in the open air exhilarating, even when the weather is bad, and they relish the hard work of repairing existing antennas and raising new ones. It's difficult not to feel a thrill as 1000 feet of hard drawn copper or steel wire rises into the air—and stays there!

Future

Our current lease expires in February 2000. We don't know if we will be able to renew it, as the site has been sold again in recent months as part of the break-up of the power generating and transmission industry. In the meantime, the club plans to have a millennium station on the air for at least 12 hours before the big event. LF operation on the ZL 1800-meter band (165-190 kHz) using the Beverage and some of the long wires is producing promising results. We hope that VKs will soon be granted a matching frequency allocation. LF DX anybody? We do know that the past three years were more fun than any of us ever imagined, and we are most grateful to the power company for allowing us this chance, which we would not have missed for the world. We also acknowledge that the leadership of Brian Miller, ZL1AZE, and his small team of dedicated helpers, supported by Quartz Hill User Group members, well-wishers and the Wellington Amateur Radio Club, made this all possible.

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