Nothing great was ever achieved without enthusiasm

The story behind the WIA's Wilkinson Award

Chris Skeer VK5MC

Ron Wilkinson – VK3ZER, VK3AKC – was born on 3 March 1919 and grew up in Kerang, northern Victoria. He joined the 2/2nd Pioneer Battalion at the start of WW2. Just before he was sent overseas, he met Mary Parker and, after a whirlwind courtship, they were married.

Mary and Ron Wilkinson, just before Ron shipped-off to the Middle East in 1941.

War experiences

He embarked for the Middle East on the converted Queen Mary in April 1941, subsequently serving in Syria and Palestine. After spending some time there, the battalion was being shipped back to Australia on the troop ship Orcades when it was diverted to Java. His battalion was dropped off in Java to fight the Japanese forces, but they were overrun and taken prisoner.

Ron was marched through Java and Singapore up to Burma to work on the Burma/Thailand railway. He contracted malaria while working on the railway, as most of the prisoners did. However, he was attended to by a Dutch nurse at this time, who saved his life. Carole, Ron and Mary's daughter, can remember this nurse visiting him later in Ballarat.

After the railway was finished, he was transported to Japan on "the Hell ship". Apparently, it was a nightmare journey as was the whole prisoner of war experience. In Japan, Ron worked in the copper mines. After "The Bomb" was dropped on Hiroshima, the Americans freed the prisoners and he was marched through the atomic bomb site to be repatriated to Australia after being a POW for over three years.

The distinctive Award certificate

Return to settle down

Back in Australia, Mary and Ron moved to Ballarat where they settled down in their first house, in Bell Street. Over the years, they had several homes as Ron had the ability to buy a house that was run down, fix it and sell it for a profit. The last house in Ballarat was located at 6 Boyle Street.

Ron had various jobs: as a painter, a fibreglass factory worker, and as a truck driver. Later, he bought his own truck and drove for the Ballarat Shire. Ron and Mary had four children: Carole, Terry, Barry and Glen.

A doctor had advised Ron to take up a hobby to get his mind off the horrors of war. In 1956, he started with a limited licence and the callsign VK3ZER, which limited transmissions to 50 MHz and above. In those days, the licence test was a written exam, generally covering basics plus the theory of receivers and transmitters and how they work.

Ham radio and homebrewing

No doubt, Ron would have started on 50 MHz as the mid-1950s neared the top of a sunspot cycle, making contacts on this band very plentiful. Ron enjoyed the challenge of making most of his own radio transmitters, receivers and antennas.

One of the hardest things for a homebrewer in the days of valve radios was the cutting of the hole to put a valve socket into the chassis. Ron had the answer in the form of a hole punch for those valve socket holes.

The early days of TV transmitting from the capital cities were not so good for operating amateur stations, especially when people were trying to look at weak television signals. Ballarat people would have been looking to receive their TV signals from the Melbourne transmitters on Mount Dandenong and were not pleased that Ron's voice came out of their TV sets.

Early radio room picture at Geelong. Lots of homebrew equipment visible here.

One of his favourite spots to operate portable was on top of Mt Buninyong, which gave him a clear view into Melbourne and beyond. His daughter Carole said, *"Dad would climb the tower and do his thing and we would run up and down the steps or play in the grass below."*

For a period during that era, Melbourne TV transmissions were taken from a receiver atop Mt Buninyong then retransmitted to the people of Ballarat and surrounds. One time, after operating up on the hill, Ron was refused fuel at a service station because, with some antennas on the vehicle roof, the attendant assumed he was the person responsible for upsetting the TV rebroadcast.

My first contact on 144 MHz with Ron from Ballarat was on 9 March 1964, with R5-S9 reports both ways. My first meeting with him would have been at an early South East Radio Group (SERG) convention in Mt Gambier, in June of 1964. Transistors were now being used and he had a little foxhunt transmitter not much bigger than a cigarette packet that could be hidden almost anywhere.

Ron began working for the PMG (Post Master General) in 1974, building telephone exchanges in Portland and then Geelong.

As an amateur operator, he was always well up with technology of the day. In 1964, the 432 MHz band became available to amateurs in lieu of the 288 MHz and 576 MHz bands (while 288 MHz was lost, with advocacy by the WIA, use of 576 MHz continued for decades until eventually 'required' for TV broadcasting – Ed).

Setting records

Ron set a national distance record when, on 12 September 1964, he had a contact on 432 MHz with Rex VK3CB (now VK7MO). Ron was on Mt Buninyong and Rex was on Mt Worth in Gippsland, a distance of 119.7 miles (192.6 km). Using valve equipment at the time, a QQEO3/20 tripling from 144 MHz, it was not a simple matter as some 300 volts had to be generated from a DC-DC converter for the high tension supply for portable work. VK7MO used a 7-element Yagi. Ron gave a readability 5 and strength 6 report to Rex, who gave Ron R5 strength 6 to 7.

From the *VHF* report in *AR* for February 1970, in "Meet the other man", Eric VK5LP mentions that Ron: *". . . now operates on 52, 144, 432, and 1296 MHz from Newtown near Geelong. On 52 he runs 18 watts to a QQEO3/12 to a five-element wide spaced Yagi.*

On 144 MHz Ron had two transmitters, one on AM using a QQE06/40 and 60 Watts output. The second of Ron's homebrew 2m rigs was a crystal-locked 144.070 MHz or 144.550 MHz SSB transmitter, which is still in existence and was recently tested and produced six watts output. It was a seven-valve transmitter using a McCoy 'silver centennial' crystal filter with a 7360 balanced modulator valve and a QQEO3/12 amplifier valve. This went to air with a 16-foot (4.9 metres) long, 10-element wide-spaced Yagi at 50-feet high (15.2 metres).

On 432 MHz, another 6/40 was used to give 60 watts to a 52-element array of four Yagis.

On 1296 MHz, he was running 3 watts from a modulated tripler comprising a 2C39BA in a radial cavity to a 6-foot (1.8 metre) dish.

All of these transmitters, and his accompanying down converters, were home-made.

DIY dish. Ron with one of his homebrew dishes. This image is used as the background on the Wilkinson Award certificate

One of the more important contests in that era was the annual Australia-wide Ross Hull VHF/UHF Contest for the serious operators (held over four weeks, mid-December to mid-January, at the time – Ed). Ron won this contest in 1964/5 with some 1000 contacts, and again in 1967/8. Again, in 1969/70 his contest participation was recorded under the callsign of VK3ZER. However, he did upgrade to a full call – VK3AKC – in December 1968.

In the national records, VK3AKC and VK7ZAH held

Ron's Geelong QTH, at 3 Harcourt street, Newtown. Note the triangle shape in the backyard (at lower left), a support ready for the new dish.

the 1296 MHz distance record of 439.3 km for their contact on 17 February 1971.

Enter EME

I am not sure where the spark for the interest in Earth-Moon-Earth (EME) operation came from. The *Geelong Advertiser* in August 1971 reported that: *"Ron had succeeded in bouncing signals off the moon and receiving echoes. Of three dishes only one can rotate and tilt and is manually operated and mounted on the chimney... As the moon moves so does Mr Wilkinson up onto the roof to realign the dish."*

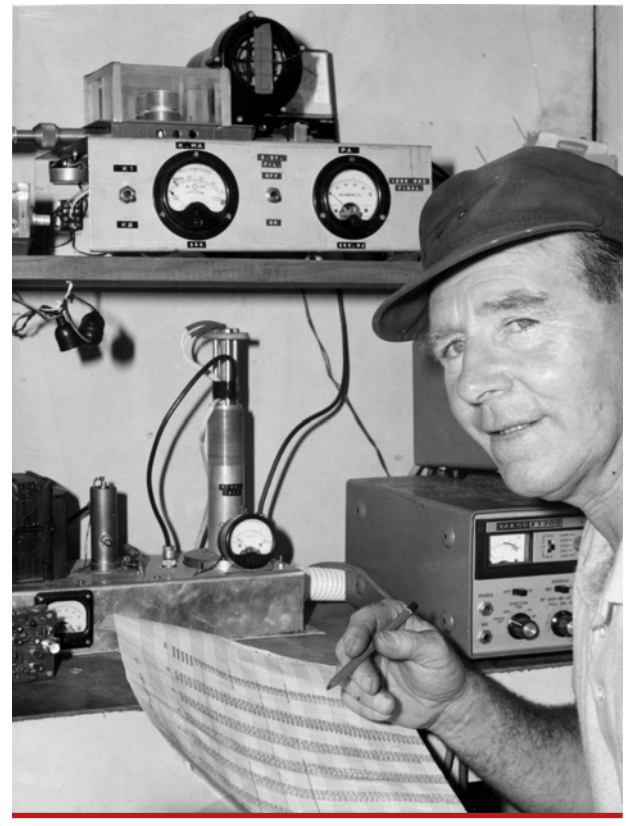
Ron's homebrew 20-foot dish in the backyard at Geelong.

At this time, there was some promotion of EME operation coming from the United States. There were 20 technical reports put out by W2NFA, the Crawford Hill VHF club, and Dick Turrin W2IMU. These reports contained information on antennas, receivers and transmitters suitable for EME operation and many detailed reports on how to measure the performance of your system.

For those not familiar with EME, or moonbounce communication, the Moon is only acting as a mirror or reflector, and a poor one at that. In Ron's case, he had a 3-degree beamwidth with his antenna and the moon subtends less than half a degree. Most of the signals that he fired at the moon missed and went straight past.

As all moonbouncers know, what does hit the moon is sprayed in all directions, like light shining on a mirrored sphere. The little bit that comes back to Earth as an echo some 2.5 seconds later, is very small. It always amazes me that we can hear our echoes at all. If you can hear your own echoes off the Moon, you should be able to hear someone else's, too.

Ron and his wife Mary spent some five months building his 20-foot (6.1 metre) dish with some help from Peter McEwen VK3ACL and Trevor Niven (then) VK5ZTN. It was quite a light-weight dish made from 1-inch aluminium tube ribs, held together by pieces of tight-fitting wooden doweling hammered into the tube;



Moon position printouts from the US Naval Research Laboratory were a key tool for Ron.

a quarter-inch coach screw was then screwed into the doweling, giving quite a light and simple structure.

Full elevation and azimuth control was made by hand adjustments. The main support was a piece of water pipe four inches in diameter sitting on a large ball bearing in a six-inch tube, buried some three feet (one metre) into the ground.

The support rotated (azimuth) and was held in position by tightening some brake clamps. Elevation was a small pulley down near the ground and a very large pulley up at the dish pivot point. The mechanism was based on the capacitor tuning mechanism used on many early wireless sets. It provided a flat elevation readout from 0 to 90 degrees.

The 150-foot dish used by the US Naval Research Laboratory for listening tests during 1973.

During 1973, the Naval Research Laboratory in Washington DC during 1973 was involved in a 50th anniversary, which included a series of listening tests for EME signals on 144, 432 and 1296 MHz (2m, 70cm and 23cm) using a 150-foot (45.7 metre) dish.

Jim Guida W3KE was leader of the Moonbounce group; the event was promoted by Howard Lorenzen W3BLC, Chairman of the Committee on Amateur Radio. They ran a series of tests in January, March, and April in 1973, listening on all three bands.

Mounbounce success on 23cm

Ron was obviously not operational until the March tests when he was heard on 23cm at 1928 GMT with a report of RST 469, along with OZ5FYN, PA0SSB, PA6MB, W2NFA, G3LTF, PA0KT and W9WCD. Ron's message *"73 to Jim and W3BLC de VK3AKC"* was received by the operators at the listening site.

You might say that the report of RST 469 was not a very good signal with a 150-foot (45.7 metre) antenna at the other end of the path, but it must be remembered the best noise figure of the time at 1296 MHz was around 3 dB for the receiver alone. About a 10 dB better signal-to-noise ratio can be expected with a 0.2 dB NF receiver of today's standard without looking at other noise contributing sources, such as the antenna or feedline.

At this time, Ron was having sent out from the research laboratories a monthly printout of the moon position, which removed one of his problems. It is all very well to see the moon come up on a nice summer's evening with a Full Moon, but trying to see it come up during the day or with an overcast sky, was another matter.

The late Ron Wilkinson VK3AKC, said: *nothing great was ever achieved without enthusiasm*

The personal computers we're used to today were not yet invented in 1973. The only way of working out when the Moon would be above the horizon was by using the Nautical Almanac that gave the position of the Moon in Greenwich hour angle (GHA) and Declination each hour, and those numbers had to be converted to elevation and azimuth for your position on the Earth. Not an easy task, especially when you have a dish with only a 3-degree beamwidth!

Ron was keen to get his receiver as good as possible. So, he purchased some Fairchild FMT 4005 transistors that cost $80 each, needing three for his preamplifiers. This gave him a sky/ground noise ratio of 1.5 dB, which equates to a receiver noise figure of around 3 dB.

He also improved the output from his transmitter. In the Crawford Hill notes, there was described a 150 watt two-tube cavity amplifier that he put together with the help of Trevor VK5NC (VK5ZTN) using two 3CX100A5 (7289A) planar power triodes.

A 7289 planar power triode of the type Ron used in his 500 watt 23cm amplifier; other moonbouncers also used them.

On the 6th of October 1973, Ron had his first EME contact with W2NFA, a record distance of 16,713 km and the first VK-to-USA EME contact on 1296 MHz. This was also a national terrestrial distance record for the 23cm band.

At that time, W2NFA was using a 60-foot (18.3 metre) 'Kennedy Dish' (named after the manufacturer – Ed) that had been designed to work on a higher frequency. It was very inefficient to get transmit power to the feed due to a long coaxial feedline and was a poor receiving system due to devices available at that time. The transmitter used a modified UPX-4 (running six 7289A valves) with 250 watts output. Dick Turrin W2IMU was the main operator of this group along with Bob WA2HVA.

To put this in perspective with other VK EME operators at that time:

- Ray VK3ATN at Birchip had his first 144 MHz EME contact on 1 January 1972 with K6MYC and VE7BQH. Ray was using a four-layer rhombic 700-foot long (213.4 metres), an antenna more common at the lower frequencies than 144 MHz.
- In January 1973, Lyle Patison VK2ALU, operating VK2AMW under the auspices of the Illawarra Amateur Radio Society, was operational on 432 MHz using a decommissioned CSIRO Radiophysics 30-foot (9.1 metre) dish designed to track the Sun. Located at Dapto near Wollongong NSW, VK2AMW was heard by the Naval Research Laboratory during its listening tests. They began hearing their own echoes on 432 MHz in March 1972.
- Chris Skeer VK5MC had his first contact on 144 MHz EME with W6PO in March 1973. I was also using a long rhombic, like VK3ATN's.

One must always remember, the higher you go in frequency the harder it always is to get good performance from your receiver. Today's receiver preamplifier performance figures were only 'dreamed about' when Ron was putting his EME system together.

EME metrics

The communications system of an EME station needs to have a good low noise receiver, a transmitter with a known, stable power output, and an antenna that has low side lobes for quietness, and the facility to be accurately pointed.

The 20-foot (6.1 metre) dish Ron and Mary built was designed for maximum gain, with a f/D ratio (focal length to aperture size) of 0.6; a modern parabola these days would use an f/D ratio of 0.4, to lower the receiver noise contributed to the system by the antenna.

It has always been much harder to generate RF power in the transmitter at the higher frequencies. In 1974, Ron was granted a high-power permit for a 500 watt DC input 1296 MHz transmitter, with a minimum antenna beam elevation of 10 degrees.

A friend from Ballarat, Eric Thomas VK3ZL, put together for him a copy of the UPX-4 power amplifier (as mentioned earlier), giving him about 250 watts RF output. It was air-cooled, but the tuning was always drifting as it warmed up, requiring constant adjustment. Ron went on to have contacts with Jan Otten PA0SSB in May 1975, then OZ9CR, and W9WCD.

He held the world record distance for EME on 1296 MHz for his contact with PA0SSB in Terhole, The Netherlands. The two points are near-antipodal locations on the globe.

Ron did a sterling effort to get his system up and running at the time that he did.

Fortunately for Ron and Mary, during 1975 they were able to visit some of the people who helped get his system going. They visited some of the other moonbouncers in Europe: Peter G3LTF, OZ9CR, and PA0SSB.

A recent letter from G3LTF notes: *". . . some years later I took my 2x 4CX250B 2 metre power amplifier out of the rack, which was all very open and unscreened and there, written on the inside of the chassis, next to the 2.2kv terminal Ron had written in pencil 'VK3AKC here 1975'."*

They also visited the USA to meet Dick Turrin W2IMU and Bob Buus WA2HVA, who operated the Crawford Hills club station W2NFA, and Howard Lorenzen W3BLC, who had helped Ron with advice and information, along with other moonbouncers, George Komadina W9WCD and Al Katz K2UYH.

Fortuitously, Ron was very pleased to be able to have a contact on 6m with a Japanese operator (JA) during one rare opening of the band to Geelong. He was also proud of the fact that he could operate on all bands from 160m to 23cm.

Ron died on the 22nd of March 1977 at the age of 58 from heart problems following a hip operation that had been causing him a lot of pain for many years.

Mary Wilkinson proposed a donation of $1100 to the WIA to commemorate his passing as he had built up a reputation over many years of activities in the VHF/UHF parts of the spectrum. The executive of the WIA considered this and an annual award was selected.

The award is for special achievement in any facet of amateur radio by any amateur in the VK call areas.

The first Wilkinson Award was made in 1978; it went to Wally Green VK6WG (SK) and Reg Galle VK5QR (SK) for their UHF and microwave contacts across the Great Australian Bight during the 1970s and '80s.

An up-to-date list of the recipients of the Ron Wilkinson Achievement Award, along with the reasons it was awarded, is maintained on the WIA website, at: www.wia.org.au/members/wiaawards/meritronwilkinson/

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