
VHF/UHF – An Expanding World

David Smith VK3HZ

Weak Signal

David Smith - VK3HZ

Hello again to what will be my last column for AR.

I've been doing this for more than 12 years (since May 2003 to be exact) and things have certainly changed a lot in that time – SDR, Digital modes, frequency-locked radios and greater access to hardware for the upper microwave bands to name just a few significant areas. We've seen a new World Record set across the Bight on 10 GHz (my favourite band) and, no doubt, the path to NZ will be crossed on that band before too long. Relatively modest stations now have EME capability, thanks to the wonders of WSJT. Distance Records on all bands are regularly being pushed out further as equipment, modes and operating techniques improve.

This column was first named way back - I can't tell you a date but at least 50 years ago. At the time, the VHF/UHF region was one of pioneering technology where people were regularly pushing the envelope – hence the column title. These days, the envelope has been pushed well up into the microwaves bands, touching the 100+ GHz regions, where the pioneering work continues. I believe this is one of the few areas in Amateur Radio where people can still experiment with things that have never been done before (e.g. Digital Modes on 76 GHz). It's exciting times and hopefully you're all enjoying yourselves.

By the way, if you want to look back through the columns over the years, the archive is at http://www.vk3hz.net/vhf_column/index.html

From the next (February) issue, David Minchin VK5KK will be taking over as columnist. Those with a long memory may recall that David was the previous author of this column, having taken over from Eric Jamieson VK5LP (SK) who had written the column for some 30 years. So, it's really "Welcome Back" to David.

So, on with the column.

ZL Opening

The opening that I reported in detail last month was just winding down as I finished the report.

Steve ZL1TPH sent a photo of his portable 2 m and 23 cm station. He uses an ICOM IC-9100 into a 100 watt PA and VK5EME preamp feeding a 1.1 metre dish.



ZL1TPH Portable north of Auckland

Chris VK2ACD reports:

“On 6 October around 1010Z to 1030Z, an opening from NSW North Coast to ZL, on a hot evening. I made a good 5x4 FM contact via the ZL Mt.Climie repeater to Ken ZL2KJ mobile - distance 2377km. I then copied the beacon ZL2WHO at S4-S5.

My station - Elecraft K3 driving TE Systems amp to about 100W into an M2 dual polarity beam, 7 el. each way.”

David VK4KSY reports:

“Using 80 watts into an 8-el yagi, stations worked on 2m:

4/10 ZL2ADU JT65B -18 from RF60WN 2506 km

5/10 ZL2ADU SSB 5X9 2506 km

6/10 ZL2ADU SSB 5X9 2506 km

ZL1TU SSB 5X2 2283 km

ZL1AKW SSB 5X1 2593 km

ZL3TY JT65B -13 from RE57OM 25434 km.”

Kevin VK4UH submitted the following report about his activities during the opening:

“The first indication of the massive 3-day tropo opening between ZL and east coast VK occurred around dawn on Sunday (19:46 UTC) on 3rd October when Ron VK4CRO (QG62nl) reported 5/5 SSB signals to Harry ZL2ADU (RF60wn). This was immediately followed by a similar QSO between VK4NWH and ZL2ADU. Shortly afterwards (20:10 UTC) VK2DVZ in (QG68gd) reported hearing the 2m ZL2WHO/b (RF70om) beacon at S9 and worked Harry on SSB at 5/9. Harry ZL2ADU went on to work VK2MAX (QF68jv) and Mick VK4NE (QG62nj).

At 20:19 3.10.15 UTC, VK2BCC (QF56di) reported working Nick ZL1IU (RF64vf) at 5/8 and VK2DVZ worked ZL1AVZ at 5/2. At 21:20 UTC conditions improved further. I made contact with Mark ZL2WHO and then again with Nick ZL1IU and Ray ZL2TAL on 2m SSB. At 21:33 UTC the path was successful tried on 432MHz SSB between myself VK4UH (QG62kp) and Nick ZL1IU (RF64vr) with reports of 5/3 in both directions.

Over the next few hours several more VKs reported hearing the 2m ZL2WHO/b beacon, which had just gone back on air and was now equipped with JT4D encoding.

These stations included VK2BCC (QF56di), VK4CZ (QG62lp), VK4UH (QG62kp), VK4REX (QG63le), VK2ZT (QF57wf) and VK4ADM (QG63mg). The 2m/70cm Logger started to light up between each of these stations on either side of the Tasman.

The tropo duct remained present throughout the Sunday afternoon with the 2m ZL2WHO/b beacon remaining stable and strong for many hours at a time and more stations joined on either end of the path including VK4WR (QG62jv) VK2MDC (QF56pm) who reported his first ever 2m DX QSO to ZL1IU.

Propagation continued throughout Sunday afternoon.

At 07:45 4 Oct UTC I again worked ZL1IU on 2m and then 70cm SSB.

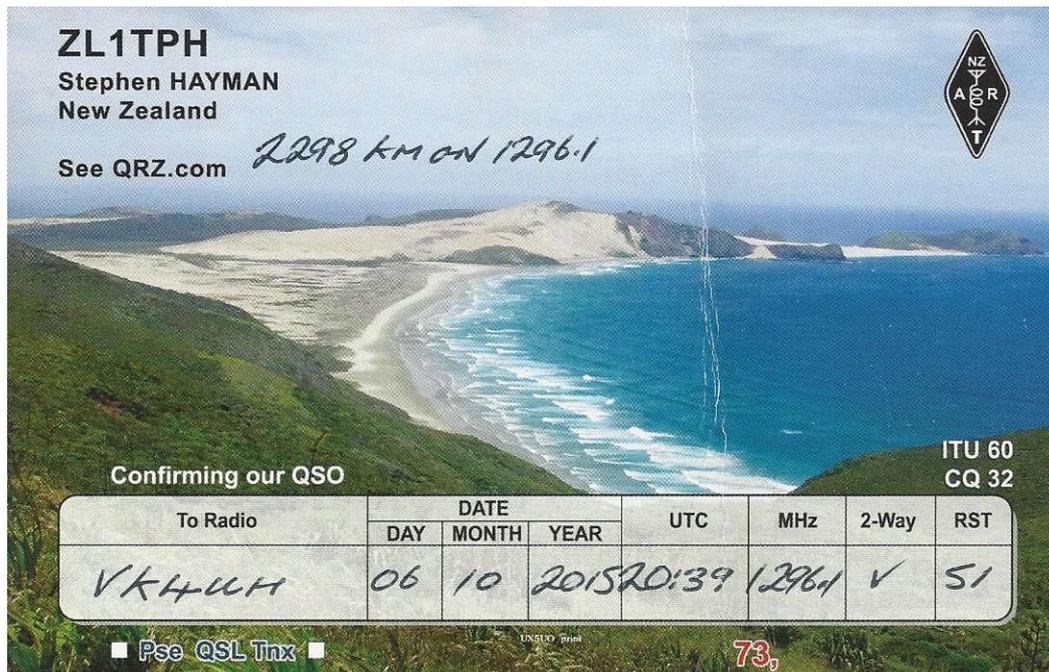
At 21:55 4.10.15 UTC (Monday morning) Rex VK4REX (QG63le) reported copying the 23cm beacon VK4RBB in Brisbane. Contacts were then made on 23cm to Rex by Scott VK4CZ and I VK4UH, all stations using an apparently backscattered path beaming QTF 100'.

Tuesday, the duct remained stable throughout the day with multiple contacts being reported on the logger. Rex VK4REX (QG63le) and VK4ADM (QG62mg) reported decoding the JT4 ident from the 23cm ZL2WHO/b beacon from 21:14 5.10.15 UTC at -17 dB level. Work stopped play for VK4UH until late afternoon. From 07:30 6.10.15 UTC onwards I (VK4UH) worked ZL1IU (RF64lr), ZL1AKW (RF82cg), ZL3TY (RE57om) and ZL2ADU (RF60wn) on 2m SSB, all at good signal strengths. Finally at 08:22 UTC I worked ZL1IU again on 70cm SSB at 5/1 in both directions. That evening VK2MAX (QF68jv) and VK2ZT (QF57wf) reported working Steve ZL1TPH/p (RH73hm) on 23cm SSB. I also reported receiving the 2m and 70cm ZL2WHO beacons throughout that evening

Wednesday. Alerted by a phone call from Scott VK4CZ I came on air again before departing for work. VK4REX had been reporting from 19:00 6.10.15 onwards decoding the ZL2WHO beacons on 2m, 70cm and 23cm. Both Rex and Scott had worked Steve ZL1TPH/p (RH73hm) on 23cm SSB with 5/6 5/7 reports. Not expecting a result from my tiny 10-element Yagi on the end of 30m of RG213, I made a call at 20:39 to ZL1TPH/p and was rewarded with a contact with 5/1 reports in both directions. My best DX at 2297 km on 23cm and first contact out of the local area.

The path remained open until the Wednesday evening. Let's hope this was just a taste of more tropo openings to come this season."

Kevin has already received a QSL card from Steve ZL1TPH for his 23 cm contact.



ZL1TPH QSL Card for 2297km 23cm contact with Kevin VK4UH

That's it from me. Thanks to all those people who submitted items for the column over the years. It helped out a lot and was very much appreciated.

So, in the words of Douglas Adams, so long and thanks for all the fish!

Meteor Scatter

Dr Kevin Johnston – VK4UH

It's been hard not to feel underwhelmed by the distinct lack of meteor shower enhancement this year. The Orionid shower came and went around the 22nd October with more of a squeak than a fanfare. The Orionid Shower occurs on this date each year as the orbit of the Earth around the Sun takes us across the trail of debris left behind by the Halley's Comet. In fact we cross this trail twice each year at either side of the earth's orbit. Even though this shower favours paths in the northern hemisphere it has still produced spectacular meteor scatter enhancement in previous years with a Zenith Hourly Rate (ZHR) of 25/hour.

Even before the predicted peak Arie VK3AMZ reported:

"The current ZHR is pretty well down at the moment for the Orionids. I must confess the shower is not living up to expectations on previous years, in fact it has been getting progressively worse. I would imagine that's a function of celestial mechanics, or just running out of rocks. I suspect the former. These things move into and out of range so to speak of the Earth's path around the Sun. Jupiter has a very big influence on the dynamics of the whole thing. I can say with some confidence conditions will not be suitable for 70cm M/S. 2 & 6 should see elevated levels of meteors but nothing that I would consider outstanding. In the past few years the shower that has been the most consistent in terms of intensity is the Geminids (expected to peak around 15 December) now that is worth considering if anyone wants to try 70cm. M/S. My predictions are based entirely on my 'feel', no science behind it. Sometimes it's great to be human!!!"

Again this year, professional commitments took me away to Sydney during that week and I missed the shower completely. Reviewing the reported MS activity from the VHF Logger showed little enhancement over random meteor activity. The “usual suspects” were on-air over the UTC weekend (23-24 October) activity sessions including VK2DVZ, VK2AMS, VK2XN, VK3AMZ, VK3II, VK3HY, VK3DUT, VK4CRO, VK4LHD, VK4NE, VK4CDI, VK4CZ, VK5PJ and VK5APN and ZL3TY on 2m. Arie VK3AMZ reported “Little Orionid activity” on 23 Oct. Bob ZL3TY in Greymouth (RE57om) did complete with Ross VK2DVZ at Cundletown (QF56gd) and Mark VK2AMS at Taree (QF68fc) on 2m.

Gavin VK3HY reported his impressions:

“In a word - disappointing. Conditions experienced here were about average. Perhaps, I missed the peak. It will be interesting to hear what others who may have been more active over the period have to report”.

On 6m MS Scott VK4CZ (QG62lp) completed with Norm VK3DUT (QF32vf), Peter VK5PJ (PF95mk), Andrew VK3OER (QF23db), Jim VK2FAD (QF56ss), Jim VK3II (QF21rn) and Mark VK2EMA (QF37qs) on 23 Oct. Phil VK5RM (PF95gc) completed with Norm VK3DUT and Gavin VK3HY (QF22pd). Mick VK4NE (QG62nj) was also decoded by Andrew VK3OER – all on 23.10. Similar MS propagation and contacts also occurred on 24 Oct but with nothing spectacular being reported. The VK4-ZL MS path was still not achieved.

Over that last few months I have reported in this column the upsurge in activity on 50MHz MS and have made reference to the two parallel weekend activity sessions now occurring on 2m and 6m. On 2m there are two designated meteor scatter frequencies or “centres of activity” to be correct. The primary operating frequency being 144.230 with a secondary frequency 100 KHz up at 144.330. Most activity, particularly using FSK441 mode during the Saturday and Sunday morning activity sessions, occurs on the .230 the primary frequency. The secondary .330 has been used for the de-facto VK-ZL MS activity session on Saturday mornings, for special activities including the VK9NA VHF/Microwave DX-peditions to Norfolk Island and at other times when testing alternative and incompatible new digital MS modes or when trying incompatible timings or reversed periods etc.

On 6m the primary designated operating frequency is 50.230. With the current increased activity and interest there is a clear need, for all the above reasons, for a secondary MS frequency on this band too. I have made a number of references to this over last few months suggesting 50.330, i.e. 100KHz above the primary, to parallel the 2m activity, as the secondary MS frequency. On reviewing the revised WIA VK 6m Bandplan however it is apparent that the recent amendments place 50.330 in the newly expanded section proposed for “future beacon use” (50.320-50.400MHz). Although there are no VK beacons currently licenced for this frequency, clearly it would be better for the MS community as a group to avoid this frequency and try to comply with the bandplan for the future. 50.330 is, in reality, already problematic for operators around Adelaide due to de-sensing from the VK5VF beacon at Crafers on 50.320MHz. As we know the new bandplan has moved away from allocating specific frequencies to specific modes in favour of allocation by bandwidths in order to facilitate new developments, while still recommending “centres of activity” rather than spot-frequencies. By its nature Meteor Scatter is one of the few propagation mode that still needs a spot frequency.

In looking for a suitable secondary frequency to suggest it is again apparent that 50.430MHz, 200 KHz above the primary activity centre will also clash with the revised band-plan as this frequency is now within the section proposed for “Propagation Studies” (50.400 – 50.500MHz). It is also clear that small frequency changes of 5, 10 or even 20KHz from the primary provides insufficient separation

between two closely located “high performance” 6m Meteor Scatter Stations i.e. running legal power, high gain antennas and preamplifiers. So where could we consider for a secondary operating focus frequency? After careful review my suggestion at this time is for the use of 50.530 MHz as a Secondary Meteor Scatter frequency. This frequency, 300KHz above the primary, provides adequate separation even for closely located stations running cross modes, periods or timings, and also complies with revised bandplan placing it in the “All Modes” section of the band. I would welcome any feedback on this suggestion.

Finally in closing I would like to acknowledge, with gratitude, the long-term efforts of David VK3HZ who is coming to the end of his stewardship of the parent “VHF/UHF – An Expanding World” column in AR. David has been its author for many years and has made this the must-read section for all of us interested in this aspect of our hobby.

The next significant Meteor Showers for the calendar will be the Leonids expected to peak around 18th November (ZHR 20/hour) and then the Geminids peaking around 15th December (ZHR 120/hr)

Please send any reports, questions or enquiries about Meteor Scatter in general or the digital modes used to Kevin VK4UH