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# VHF/UHF – An Expanding World

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David Smith VK3HZ

## Weak Signal

David Smith - VK3HZ

The weather conditions over the weekend of May 9<sup>th</sup> to 11<sup>th</sup> produced some unusually good conditions for the time of year. A slow-moving high-pressure cell passed across southern VK5 and seemed to squeeze itself between Victoria and Tasmania before heading up through VK2 and across the Tasman. This produced several days of very good tropo conditions across the southeast of the country.

The first sign of good conditions was noticed by Brian VK5BC, who was hearing 2 m beacons all around, including the recently revived VK7RAE on the north coast of Tasmania. Brian, Phil VK5AKK and Garry VK5ZK (Goolwa) were holding up the Adelaide end and worked a number of stations in Melbourne including Jim VK3II, Mike VK3AAK and Ron VK3AFW. Brian was also able to work up to Leigh VK2KRR at The Rock, near Wagga Wagga with very good strength. The opening moved east so that the Melbourne – Mt Gambier path was extremely good with Colin VK5DK easily working VK3AAK on 23 cm. The path across to northern Tasmania was also lifted, with Brian working Norm VK7AC. At one stage, Dave VK3HZ worked Norm with S7-9 reports with both of them beaming towards Adelaide. Karl VK7HDX and Peter VK7LCW were also in on the action. As the high-pressure cell continued east, Brian VK5BC worked Rob VK1ZQR in Canberra over a very difficult path. Rob attempted a contact with Karl VK7HDX, but although Karl could hear some of Rob (4/1), Rob heard nothing over his local noise. On the evening of May 11<sup>th</sup>, Mike VK3AAK managed to work Phil VK5AKK on 23 cm – a 665 km path. The enhancement then moved out over the Tasman with the Hepburn Prediction page showing possible good conditions to ZL. However, there were no reports of any VK-ZL contacts.

## Meteor Scatter

The Eta Aquarids meteor shower peaked on May 6<sup>th</sup>-7<sup>th</sup>. Reports from the regular weekend Meteor Scatter operations showed that the meteor rate was not much above the norm, but there seemed to be a lot more long burns, indicating much bigger rocks. However, the morning Aircraft Enhancement net saw some interesting contacts. Jim VK3II reports:

*The time was 0825 EAST on Monday May 7<sup>th</sup>. I was just finishing an AE contact on 144.2 MHz with Don VK2RS. His signal was becoming weak when I heard someone coming in over the top of Don calling John VK1CJ. It turned out to be Rod VK4ARN. He called John twice with no apparent response, then Russell VK3VZP called Rod and exchanged signal reports. Next I called Rod and exchanged 5/5 signal reports.*

*Rod's signal was in for a minute or so - one very long meteor burn, or perhaps a string of meteors close together?*

*Via the VK Logger, I found that Wayne VK4WS had, on Tuesday morning, heard me for several seconds. On Wednesday, he copied the complete callsign of Rob VK1ZQR.*

*John VK1CJ adds: I thought I was talking to Trevor VK4AFL as I clearly heard the callsign at S4. However, apparently Trevor was not on at the time. That was Monday and I heard several burns that morning that lasted 20 seconds or so. The morning before, Sunday, I heard 2 VK4's talking to each other for about 15 - 20 seconds but*

could not call them at the time due to heavy VK3 traffic coming in the back door. On Tuesday morning I heard fainter signals from VK4 but not Q5. Wednesday morning nothing heard. On Thursday morning, Col VK2KOL told me that VK4ARN and another were clearly hearing me again. I heard very weak signals from VK4 but not good enough to work

## **WIA AGM**

Barry VK3BJM and I recently did the long trip from Melbourne to Parkes for the WIA AGM and visit to The Dish at Parkes. Barry takes up the story:

*My mobile station had a long-overdue workout on the run up the Newell Highway to Parkes and back. We departed very near to the scheduled time of 0800 AEST on Friday morning, and heard bits of contacts for the first hour. Heard and worked were Jim VK3II and Ron VK3AFW; heard but not worked were John VK1CJ and Rob VK3XQ. After our last contact with Jim (at about 1000 AEST), things fell quiet.*

*We met with Leigh VK2KRR at his place at The Rock, and, whilst parked outside, the VK3RGL 2m beacon was quite audible (via AE). Using Leigh's station, a quick chat was had with Alan VK3XPD and Trevor VK3VG, who were alerted to be on the hear-out for us once we got mobile again. However, once we left The Rock and got close to Wagga, we lost the VK3RGL beacon signal, and nothing more was heard from down south, despite many CQ's. We arrived in Parkes at 1930 AEST without any further contacts.*

*Parkes is an excellent location for Aircraft Enhancement. It lies directly under the Melbourne-Brisbane flight path and is also crossed by large internationals heading out of Sydney to the northwest. The skies over the weekend were clear and blue, and criss-crossed with vapour trails from passing flights. On Friday evening, we were even treated to the spectacular sight of the Dish with the moon rising behind it, Jupiter nearby, and an aircraft passing overhead with vapour trail glowing in the moonlight.*

*So, on Sunday morning we shot up onto Bushman's Hill at the North end of Parkes (QF46cv), keen to "work the aircraft" on 2 m. We started calling at about 0815 AEST and in the following 45 minutes worked the following: Rob VK1ZQR, John VK1CJ, Trevor VK3VG, Ted VK1BL, Mike VK3AAK, Mike VK2FLR, Adrian VK2FZ, Colin VK2KOL, Jim VK3II, Leigh VK2KRR, and Russell VK3VZP. Heard and very nearly worked was Brian VK3BBB – his 5x1 signal sank quickly into the noise before I could get a report back. Heard but not worked were VK2FABV and VK2KGX on voice, and VK3HY and VK2GKA on CW (if my reading of the CW was 100%). Oh, and Rex VK7MO/m2 with Peter VK3KAI at the microphone was also worked – 5x9+ mobile below us in Parkes!*

*Jim VK3II won the prize for the most distant station worked, at 640 km, narrowly beating Mike VK3AAK at about 633 km.*

*Those 45 minutes restored my faith in my system, although the VK3RGL 2 m beacon was still not being heard at all, which I found a little strange.*

*Mike VK3UBM joined Dave VK3HZ and me for the trip home, and we left Parkes at about 1300 AEST. We were nearly at the VK2/3 border before the VK3RGL beacon was heard again - strange conditions. On the way back, via the Newell and Goulbourn Valley highways, we had a couple of brief contacts with Rex VK7MO/m2, who was travelling virtually a parallel route down the Olympic Way from Wagga to Albury, then down the Hume. Contact #1 with Rex at the Rock, as we arrived at West Wyalong; #2 with Rex 70km from Albury, when we were 60km from Jerilderie; #3 with Rex on the outskirts of Albury, when we were 15km out of Jerilderie (we'd*

*stopped to take some photos; Rex wasn't flying...); and lastly with Rex in Bell St in Melbourne, as I pulled into my driveway in Kyneton. None of these contacts were very long in duration, or of a strength to threaten hearing, but were pleasing as mobile-to-mobile contacts at distances of between 100 and 150km.*

*We also worked Leigh VK2KRR as we approached Jerilderie, and again as we arrived at my QTH.*

*All contacts were made using the Big Wheel antenna, 3m of FSJ4-50, 150w from a Mirage B5016 amplifier and an Icom IC-706MkII G.*



### **Barry VK3BJM at Parkes**

*Holding the WIA AGM at Parkes, and incorporating an inside visit to the Parkes Radio Telescope, was stroke of genius. Praise to Robert VK3KRB and those who assisted him in organising the weekend. They could only have topped it by gaining operational use of the dish for the day. We had to settle for a very close look and brilliant weather. Maybe next time?*

### **EME**

Charlie VK3NX has been busy building equipment and feeds for new bands for EME. After much success on 5.7 GHz and 10 GHz, he is now aiming for 3.4 GHz – a band that is sparsely populated, both for terrestrial and EME operations. Charlie reports:

*I've had only a couple of contacts and new initials on 10 GHz. After extensive tests with F5VKQ, I seemed to be about 2 dB down due to feed "overmoding" problems. I have remade it in smaller diameter pipe and have achieved 34dB return loss - a huge improvement and I hope now to get more of that "precious" 10 GHz energy out and onto the dish.*

*I have fully set up the station now for 3.4 GHz. I have approx 90 W at the feed thanks to some surplus 50 W PA units and a homebrew splitter / combiner*

*arrangement. The feed is a scaled replica of my 5.7 GHz "screw polariser" and with circular polarisation, it should make it easier to have contacts with both North America and Europe without having to manually switch feed polarity as I do on 10 GHz. I have noticed that heavy cloud cover attenuates the 3.4 GHz signal by as much as 1.5dB as evidenced whilst I was doing sun noise measurements.*

*I should have some skeds very soon, and an "activity" weekend is planned for June, with the 9 (!) stations currently QRV worldwide on 3.4 GHz EME. As with 2.4 GHz, there is a discrepancy between the world wide band allocations, and I've had to build a 2nd LO and switching arrangement, to be able to receive the NA stations on 3456 ...hopefully!*

Doug VK3UM has released updates to his popular suite of EME and EMR programs. The software is available for download from a number of sites including: [www.ve1alq.com/downloads/software/vk3um.htm](http://www.ve1alq.com/downloads/software/vk3um.htm)

The release includes:

- Transmission Line Calculator Ver 1.08
- EMR Calculator Ver 6.02
- EME Calculator Ver 3.05

Doug also mentions that John VK5DJ has undergone extensive heart surgery is making a rapid recovery. The interfacing between John's Tracking System and EME planner is complete. More details at: [www.corprit.net/~jdrew/Beam/Beam.html](http://www.corprit.net/~jdrew/Beam/Beam.html)

### **VK-VHF Email Reflector**

The VK-VHF email reflector has been moved to a new host. The address has changed to: [lists.vk2djg.net/mailman/listinfo/vk-vhf](mailto:lists.vk2djg.net/mailman/listinfo/vk-vhf). Otherwise, it's business as usual.

Please send any Weak Signal reports to David VK3HZ

## **Digital DX Modes**

Rex Moncur – VK7MO

Rex is currently having a long break on the mainland, so David VK2AWD has penned something for this month.

With weak signal VHF work, it is useful to have more than one way of assessing the performance of your receive system. A distant TV signal received via Earth-Moon-Earth (EME) can provide a repeatable way of doing this. In my case, I periodically check the Channel 5A TV vision carrier signal on 138.250209 MHz from Mawson in Western Australia via EME.

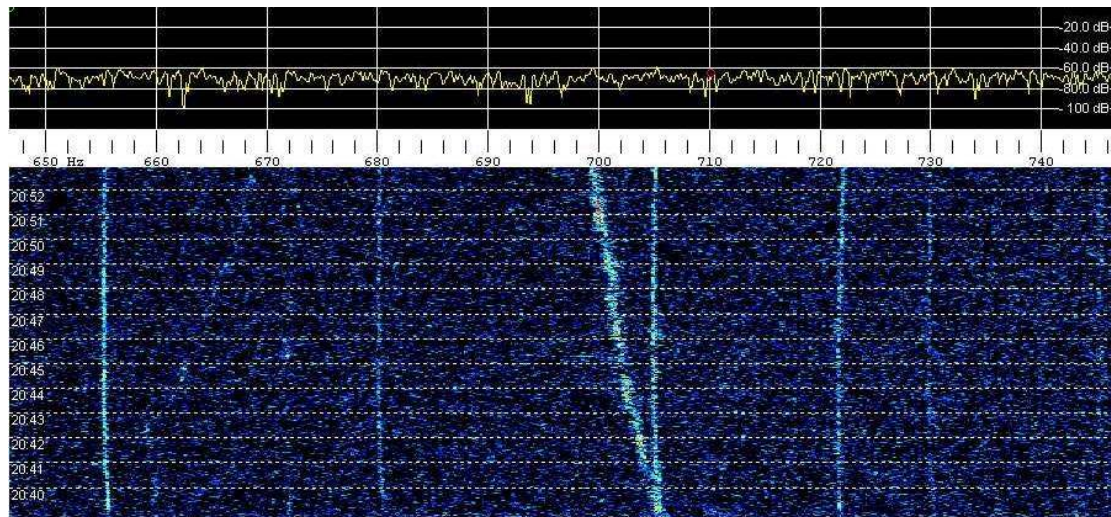
Whilst the signal is inaudible, it is often visible as a single fuzzy line trace on my computer monitor using the Spectrum Lab program with a FFT bin width of around 170 milliHertz. This program needs to be run on a reasonably fast PC with a suitable soundcard connected to the low level audio output from the radio. To receive these signals you will also need to run a suitable moon-prediction program (e.g. Ztrack) that will give you the moon azimuth and elevation along with the Doppler shift for various times at both the transmitting and receiving sites.

A 10-element yagi for the 2 metre band, which will work at 138 MHz (albeit with slightly reduced performance) should be sufficient for the antenna. I use 2 x 13 element yagi's and an FT847 radio (with no external preamp) at my station in QF56ng. Some vertical elevation capability for the antenna system is necessary, as



the maximum ERP from the TV station antenna is in the low elevation range (e.g. 0 to 4 degrees), when the moon elevation at the receiving end is reasonably high (e.g. greater than 25 degrees elevation). The higher elevation at the receiving end also helps to provide a quieter receive environment.

I use the stable vision carrier signal from Channel 5A at Newcastle on 138.276025 MHz as a reference to manually correct for any receiver frequency readout error or drift. I normally place the EME signal at around 700 Hz offset. Both the Newcastle TV dial reading and Doppler shift are entered into a simple spreadsheet program, which calculates the dial frequency needed for receiving the EME signal.



**Channel 5A Mawson WA via EME**

The screen dump shows the 8 September 2006 traces from Channel 5A TV Mawson EME signal (single sloping fuzzy line due to changing Doppler shift over time) and the Newcastle terrestrial signal side bands (multiple and almost vertical traces).

The technique might also be used for other TV transmitting and receiving locations providing the relative moon elevation range is satisfactory, the TV signal is stable and the ERP from the transmitting site is sufficiently high.

Please contact Dave VK2AWD at QTHR if you would like more information.

Please send any Digital DX Modes reports to Rex VK7MO

## The Magic Band – 6 m DX

Brian Cleland – VK5BC

April was an interesting month on 6 m with several openings to Japan, mainly from northern Queensland, as well as some sporadic E openings within Australia.

April 13<sup>th</sup> proved to be a good day with Trevor VK3VG at Cobram and Paul VK2YVG at Broken Hill working several JA stations. At the same time Jeff VK4BOF in Atherton was copying Paul and the JA stations. JA1VOK reported working VK2YVG, VK3VG and VK4's ABW, BEG, FNQ & SIX all in northern Queensland. JA2HCB reported hearing the Alice Springs beacon VK8RAS and later the same day Brian VK5BC reported hearing the Townsville beacon VK4RTL.

Then on April 14<sup>th</sup>, both the Dampier VK6RSX and Townsville VK4RTL beacons were heard in Japan with several northern VK4's again working JA's. During this opening

Jeff VK4BOF at Atherton made his first contact into Japan with JQ6RUP - well done Jeff.

Good openings to Japan again occurred on April 18th and 19th from the Mackay area with Andru VK4KAY and Kevin VK4BKP working into Japan on both days. On the 19<sup>th</sup>, Andru worked several JH1 stations whilst mobile.

On April 23<sup>rd</sup>, a good sporadic E opening between VK4, VK2 & VK5 occurred. Several stations were active in each state and the band was open for several hours. From VK5, stations from north of Brisbane to as far south as Wollongong were worked and the FK8 beacon was audible for some time. VK4's from as far north as Mackay worked into VK2 and VK1.

An unexpected opening lasting half an hour from VK5 to southern Japan occurred on Sunday 29th April at around 0800 UTC. Brian VK5BC worked JA6RJK, JA6TEW and JA6EXN, all with signals up to 5/9.

I received a note from John VK4TL near Atherton who reports;

*On Wednesday 2nd May, the band opened to China and I was able to work BG4CZM and BG5HAR just after 0815Z. Then VK4BEG worked another Chinese station. T88KL was then contacted at 0839. He was working one JA station after another and it was very difficult to pick out the call. I got the last two letters and looked up on the loggers. I then called him and he came straight back. I also heard a JD1 volcano island, but don't know which one. The band has been a bit quiet since then.*

On May 7<sup>th</sup>, Scott VK4CZ Brisbane reports hearing both the VK7RAE northern Tasmanian beacon and VK7RST Hobart beacon and working Joe VK7JG in Launceston. On the 8<sup>th</sup>, Norm VK3DUT worked Rod ZL3NW near Christchurch. At the time ZL TV audio was also audible in VK5.

Remember to keep listening on the band during June for the usual mid winter sporadic E openings.

Please send any 6 m information to Brian VK5BC