

---

# VHF/UHF – An Expanding World

---

David Smith VK3HZ

## Weak Signal

David Smith - VK3HZ

Things have quietened down even more this month, so not a great deal to report.

On the morning of February 8<sup>th</sup>, there was a fairly weak opening from the Adelaide area across to the southern tip of WA. Channel 5A, east of Perth, was being heard at S5 by Phil VK5AKK and Brian VK5BC. At 2230, Brian worked Wayne VK6JR on 2 m at 5x1. By 2255Z, signals had risen to 5x3 and Channel 5A was S9.

The following morning, conditions were up again and Brian worked Phil VK6ZKO at 5x1.

### 10 GHz beacons

Alan VK3XPD reports that he has completed the installation of the VK3RXX 10 GHz Beacon at his QTH, QF22nd in Camberwell, Melbourne. He would appreciate any signal reports.

The beacon is GPS-locked on 10,368.530 MHz and delivers 2 watts to a horizontally-polarised omni waveguide slot antenna with 9 dB of Gain - all mounted up a tower at about 8 metres.

Colin VK5DK reports that the Mt Gambier 10 GHz beacon is currently undergoing extended testing. It is GPS-locked on 10368.550 MHz, delivering 2 watts.

While testing on Colin's roof, it was "heard" (with Spectran) by Russell VK3ZQB at a distance of 140 km. Currently it is installed on "The Bluff" (QF02gg) for this DX season, with the intention that it will be permanently installed with the other beacons on Mt Graham, once testing is complete.

### 77 GHz EME

Getting an echo back from the moon is difficult enough on 2 m, but Sergei RW3BP recently succeeded in doing it on 77.5 GHz! However, a two-way contact is probably a little way off, as there is not yet another station capable of this. Sergei writes:

*Last weekend (February 17) I tried my first echo test on 77.5 GHz. The weather was good for the test. No clouds, temperature -7C, humidity 85%. Transmitted signal was simple "E" - 25% on and 75% off with 0.7s period. Three periods to transmit and five periods pause to switch Tx/Rx and to receive. Echo signal was -20...-22 dB under noise in ref to 3 kHz BW. To detect echo signal I used my MWCW program. The signal was well seen after 1 min averaging.*

*Test was at elevations from 30 to 50 deg. Moon noise was about 0.4 dB. Antenna is 2.4m alu offset dish. Output power of TWTA is about 60W. Noise figure of Rx is about 6dB.*

Please send any Weak Signal reports to David VK3HZ

# Digital DX Modes

Rex Moncur – VK7MO

## 24 GHz EME World Record

On 14 February, at 0100 Hrs UTC, the first VK, 24 GHz EME Digital QSO was completed by Alan VK3XPD to Al Ward W5LUA in Texas, USA. The distance of 14,496 km is a new 24 GHz EME World record for any mode. Alan VK3XPD writes:

*Both stations used GPS locking with Al running a development Doppler software correction package written by Gerald - K5GW. Doppler frequency movements on 24 GHz EME can be up to +/- 64 KHz. Gerald's software corrects for these Doppler movements at Al's QTH which simplifies the Tx/Rx at my end so that I run a fixed frequency on both Tx and Rx of 24048.225 MHz.*

*With the Moon rising to a relatively low 13 degrees of elevation at my QTH, we confirmed that we could see each other's 1270 Hz sync tone in WSJT, JT4F. Heavy smearing of almost 200 Hz was very obvious on these tones. We quickly swapped over to the "Callsigns and Reports" format and I successfully got a decode at -22 from Al on the next Rx sequence. The heavy smear on our signals caused a few unsuccessful decodes at my QTH but we finally completed the QSO with callsigns and 73's at 0114 Hrs UTC.*

*Al is running a 2.4 metre offset dish and a TWTA that delivers 100 Watts. I'm using a 10 foot prime focus dish and a TWTA that delivers about 15 Watts.*

(Photos of Alan's 24 GHz set up are at Figs 1 and 2.)

*My thanks must go to Joe Taylor - K1JT for his WSJT package but a special thank you must go to Rex VK7MO for his persistent efforts in driving the enhancements to Joe's WSJT software which allow these VERY Weak Signal operations.*



Fig 1: VK3XPD's World Record Breaking 24 GHz EME Set-up



Fig 2: VK3XPD Moves the Boat to allow for changes in Moon Declination

### **Enhancements to JT4 Mode for 10 and 24 GHz EME**

Last month Rex VK7MO reported on tests with the JT4 mode with his 47 cm portable station on 24 GHz. Since then numerous files have been sent to K1JT so he could look at improvements. Significant improvements have been made such that even with spreading as high as 200 Hz it is possible to achieve Deep Search decodes at around -24 dB and further improvements are being made on an almost daily basis. As a result Rex can now copy W5LUA real-time on 24 GHz with his 47 cm dish. The latest version of WSJT with the JT4 enhancements is available at:

[http://physics.princeton.edu/pulsar/K1JT/WSJT9\\_r3033.EXE](http://physics.princeton.edu/pulsar/K1JT/WSJT9_r3033.EXE)

### **New VK 10 GHz EME Digital Record**

Using the enhanced JT4 mode (see above) Rex VK7MO was able to work Charlie G3WDG for a new VK 10 GHz EME digital record of 17,410 km. Rex was using his portable 77 cm dish and 45 watts and Charlie a 3 metre dish and an experimental single bare-die GaN transistor PA producing 14 watts. Decoding was achieved down to 8 watts.

Please send any Digital DX Modes reports to Rex VK7MO

## **The Magic Band – 6 m DX**

Brian Cleland – VK5BC

Firstly I'd like to thank Roger VK2ZRH for submitting 6 m notes for the March Magazine. After 8 years of writing 6 m notes for AR I now find that my present lifestyle which includes both caravanning around VK and some overseas travel that I am spending lengthy periods of time away from my home QTH. This as well as my AR concentration no longer being mainly focused on 6 m it has become increasingly difficult to complete the notes each month. For these reasons these notes will be the last 6 m monthly notes I will be submitting.

February was again very down with only some openings to Japan and Asia mainly from VK4 with only some odd contacts being completed further south in VK. The E's were also quiet with only a couple of local VK openings.

3rd Feb Jack VK2XQ in Sydney reported the FK8SIX/b and the northern VK4 beacons reported in VK3 and VK5 and several contacts were than completed

between VK4 and VK3/5. A little later in the day at around 0500UTC Frank vk7dx and Al VK1RX worked Mark VK8MS in Darwin. At around 0700UTC Steve vk5sfa reported both the Perth and Bunbury beacons and John VK5PO worked Graham VK6RO. The day rounded off with Frank VK7DX working John VK5PO.

The morning of the 4th Feb Phil VK5RM reported the Perth beacon and completed with Peter VK6KXW CW. Phil also decoded John VK6JJ and Glen VK6IQ on WSPR

The afternoons of the 6th and 7th Feb saw several contacts completed by southern VK4's including George VK4AMG, Wayne VK4WTN and John VK4ZJB with JA1, 2 and 3 stations.

Late morning 9th Feb VK6 to VK5 with Andy VK6OX and Ken VK6AKT working Steve VK5SFS and Brian VK5BC. In the afternoon the band again opened to southern VK4 to JA with George VK4AMG also reporting HL5BMX working several VK4's including John VK4ZJB in Gympie.

11th Feb George and John again worked into JA.

15th Feb John VK5PO completed with Hiro JR2HCB CW.

Several days during Feb JA's had been reporting the KH9/WA2YUN Wake Is beacon and on the 17th Feb both Scott VK4Z and Wayne vk4WTN reported the beacon.

19th Feb Frank VK4FP reported JA's very strong into Townsville as well as BG6CJR from Anhui Province, China. Wayne VK4WTN also reported hearing BG6CJR

21st Feb Bob ZL1RS who is located at the top of the North IS with a great outlook to the USA and a good station worked 13 x W's best being W9RPM in Wisconsin at 12968km.

23rd Feb Hiro JR2HCB reported good TEP conditions to Darwin reporting the VK8VF beacon and Mark VK8MS.

24th Feb another opening to the north from VK4, This time Ray VK4BLK from Yeppoon was in the action working several JA's in CW as well as Li BA4SI and HL4CHH. The opening extended down to the Brisbane Area with Scott VK4CZ also working Li BA4SI.

25th VK4AMG worked 8 x CW, 1 ssb, 3 x JT65 50.090.

26th and 27th Feb Ray VK4BLK in Yeppoon worked several JA's including JN1NNN, JI1CPN using JT65.

If you are an early riser, most days anytime from 1930UTC there are quite a few stations from VK1, 2, 3, 4, 5 and 7 completing Meteor Scatter contacts on 50.200 MHz SSB.

As can be seen from the above conditions have been very disappointing and we can only hope the sunspot cycle produces something around the Equinox.

Reminiscing over the period I have been writing the notes I think one of the positives has been the ability to work into the Pacific areas regardless of the point of the Sunspot cycle. It has become very clear provided there are dedicated 6 m operators at the various Pacific locations and contacts are possible to all areas of VK with distances to over 7000 km. Typically Victor E51CG in Raratonga, South Cooke Is and Warwick E51WL in the North Cook Is have been regularly worked in VK in December/January over the last few summers and similarly Paul A35A from Tonga has been regularly contacted. To a lesser extent due to the lack of activity from these areas stations from Fiji and Vanuatu areas have also been worked. Along with the Pacific stations Willem DU7/PA0HIP in the Philippines has made a regular trip into VK over the summer months. Also early in the month of January contacts have been completed into USA and Central America when history would have suggested they

were more likely around the Equinox period. Studies completed by Roger VK2ZRH and some good work done by Andrew VK3OE with backscatter radar seem to suggest that multiple "E's" are involved in many of these paths and that we should be more diligent for contacts via these means of propagation during both the summer and winter "E" seasons.

Another positive has been the development of VKLogger by Adam VK4CP. This is of great assistance to all VK 6m operators and unfortunately is under a cloud because of abuse that occurs on it and the associated IChat. This abuse has been by a small number of users which is very disappointing as a small minority are ruining it for the majority and putting an excellent aid at risk of being closed down.

Finally I would like to thank all those who have forward me details for inclusion on the notes over the years and wish to thank John VK5PO for volunteering to continue with producing future monthly 6 m notes.

Good DX and catch you on the Magic Band.

73 Brian

VK5BC