
VHF/UHF – An Expanding World

David Smith VK3HZ

Weak Signal

David Smith - VK3HZ

At this time of year, the weather conditions in this region can produce some quite intense tropo openings over relatively short distances. For instance, on the evening of March 1st, the VK5RSE beacon, over 430 km away, was 5x9+ on all its operating bands (2 m, 70 cm and 23 cm). It was a similar strength the following morning. These are the times when the microwave enthusiasts at each end need to drag their gear up to a nearby hilltop because it's almost certain that the microwave bands will be open for good contacts.

Colin VK5DK in Mt Gambier experienced some good conditions recently to the west. He reports:

On the morning of February 19th, there was a 144 MHz opening to VK6 with two contacts to the far south-west corner of VK6 from Mt Gambier (south-east corner of VK5) - distances of 2365 km (VK6JR) & 2325 km (VK6APK).

Wayne VK6JR (Dunsborough) called CQ beaming east (2306Z 18/02) and I contacted him with a 5 x 5 report sent and received a 5 x 2 report in exchange from Wayne. At the conclusion of the contact at 2310Z, I was called by Alek VK6APK (Marmion) with 5 x 3 reports both ways. Alan VK3XPD could not hear anything of VK6JR, but did hear very weak signals from VK6APK

During the opening the VK6RST 144.564 MHz beacon (Mt Barker) and VK6REP (Esperance) 144.567 MHz beacons were both around S5 but nothing heard of the VK6RPH beacon in Perth. It was found out later that the VK6RST (Mt Barker) 70 cm beacon was off air due to storm damage, as reported by Rob VK6LD, but it is hoped to be back on air very shortly.

The VK6REP beacon increased in signal strength and was up to S7 at 0200Z.

I was fortunate to meet Murray ZL3MH at the recent Hamfest in Kyneton. Murray lives in the outskirts of Christchurch and so has a fairly formidable attenuator between his QTH and VK. Nevertheless, he has managed to work into VK on 2 m. He sent the following:

I specialise in 6 m and 2 m DX and have worked quite a few VK3 stations including right into Melbourne on 2 metres.

We have had only one two metre opening to VK this season, on the January 6th. I worked Ross VK2DVZ 5/2 - later S9 - VK2AMS and heard Neil VK2EI. If it had not been for John ZL3AAU following the Paggers and Ch 5a and his ring around, nothing would have been worked.

I am still running the same gear I have for many years. My gear is a 12-element yagi fed with LDF4-50 coax at 10 m, 80 watt MRF245 HB amp, FTV250 with mods, FT101zd MK3 on two metres. On six metres, there is a 4-element yagi to FTV650b and a FT101zd MK3. We have 8000 ft of Southern Alps in the way so Sporadic E is the only way.

Here, all DX contacts are over 2000 km.

VK5MC EME Activities

Chirs VK5MC near Millicent sent in the following report of his EME activities:

I came on 1296 MHz for the full moon on 30th Jan just to see who might be around and was expecting a lot. I heard some Digital signals and tuned down the band and was surprised to hear a strong SSB signal. 8J1AXA was on for their moon rise also and was in contact with Dave VK2JDS. I waited until their contact was over and received a 5x6 report from them and gave a 5x5.

Their station is an 18-metre dish, which has been operational on 144/432 and now 1296 MHz. They said that they should be able to work a station running 10 Watts to a 3-metre dish on CW, and even less on JT65.

Any information on their operation can be obtained on the 8J1AXA web site. For those who wish to try, they also have a logger operating.

I continue to be amazed at the simple operation of my VK5DJ tracking system which has been upgraded with a built-in time clock, so that I don't have to start from scratch each time I get a power glitch - something that seems to happen quite a bit out in the bush. The tracking system has many user-defined variables in it for moon and satellite tracking. It has a wide range of encoder inputs, depending on your needs, including a simple potentiometer. John VK5DJ does still have some boards available for this project.

Lastly I have been playing with a SDR Softrock receiver here and have just been able to get it going, but it certainly looks promising for those wishing to see a segment of the band be it microwave or some band. Currently I am able to see 90 KHz of 1296 MHz, and can see at a glance any JT, SSB or CW station that may be on at that time with out turning a dial. Information will be presented at Gippstech in July.

Please send any Weak Signal reports to David VK3HZ

Digital DX Modes

Rex Moncur – VK7MO

Starting up with Small Station 2 metre EME

Wayne VK5APN reports: Well being only new to the digital modes (and getting back seriously into AR) for some 3 weeks, I realised that the moon was going to be in a good position and close to earth on the 30/31st Jan. I emailed EA6VQ (Gabriel) as his Web site indicates that he can work people off the moon who have a single yagi and 50w. So I got up a bit earlier before the MS session on the Sat. The moon was near the horizon, listened but heard nothing. The next day went out at 0400 and the moon was up at 30 degrees. A bit high. So I went to the N0UK logger. I saw ES6RQ posting his frequency. So as I was passing time for the moon to get closer to the earth, all of a sudden I see JT65b traces on the screen. Decoded as ES6RQ. I could not believe it as the moon was at about 20 degrees elevation. So started calling him, and succeeded working him. Then came the entourage of callers all trying to work a unique grid (PF). I almost succeeded with Joop (PA0JMV) saw his RO but nothing decoded into text at -30. Did try with Joop for the next 3 days, but no contact occurred. Call signs exchanged both times, then only he decoded my calls twice, then nil; for the 3 days attempts. [Wayne completed with PA0JMV on 27 February and EA6VQ and I2FAK on 28 February 2010]. My set up is an IC706, Dick Smith amplifier kit running 80 w into 10 m of RG-213 coax to a 10 Element YU7EF Yagi, 6 m high. No Preamp, no elevation and no high stability osc or GPS locked. I was simply over the moon.

New Digital Mode ROS

José Alberto Nieto Ros has introduced a new Digital mode called ROS which has potential for application at VHF with weak signals. Information and download can be found at <http://rosmodem.wordpress.com/2010/01/30/ros/#comments>

The mode has speeds of 16 and 1 baud with faster speed being designed for typing speed and the slower speed for very weak signal work. The mode is based on spread spectrum techniques and includes Forward Error Correction (FEC). It is designed to cope with interference and issues such as multi-path propagation and might overcome the problem that JT65 suffers on terrestrial contacts with meteors. Computer to computer testing against a noise source shows the slower speed works reliably to around -27 dB which is similar to WSJT's deep search decoder but with the flexibility to send any random piece of text. It has been used successfully on HF and there are a few examples of successful EME contacts but many users are reporting difficulties on VHF. Testing between VK3II (FT736) and VK7MO (IC910-H) showed that it performed reliably at around -24 dB with VK7MO transmitting and decoded very poorly the other way. A test between VK3VHF (IC910-H) and VK7MO (IC910-H) showed that ROS was reliable to around -22 dB both ways. It seems the main problem is that ROS uses a very wide bandwidth from 400 to 2625 Hz and that many rigs may not be able to TX or RX the full range of frequencies. The problem is even worse as the mode is designed to cope with frequency errors of up to +/-200 Hz which means one needs a bandwidth from 200 to 2825 Hz on receive.

As this column was being prepared a new version of ROS (version 2.2.4 designed for EME) was produced with narrower bandwidth (about 100 Hz) which should be a significant help with typical VHF receivers and transmitters. A signal generator test of this new version was carried out to compare it to JT65a in the RF environment using an IC910-H receiver. The tests results are all referenced to the WSJT dB scale with the signal generator modulated with the JT65a or ROS signals. To provide a reference for the test the signal generator level was adjusted so that JT65a was just decoding reliably with the Kotter-Vardy decoder (no prior knowledge) at which level WSJT was reporting a signal level of -24 dB, consistent with K1JT's measurements. The ROS results were then obtained by reducing the signal level from -24 dB to -30 dB with the levels and decodes as shown below:

-24 dB

```
RX: <02:07 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <STOP>
RX: <02:10 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <STOP>
RX: <02:13 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <CANCEL>
RX: <02:16 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <STOP>
RX: <02:22 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <STOP>
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-26 dB

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RX: <02:25 UTC> <9.8 Hz.> VK3II VK7MO QE37PC I_O <STOP>
RX: <02:29 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <STOP>
RX: <02:32 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <STOP>
RX: <02:35 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <STOP>
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-27 dB

```
RX: <02:38 UTC> <9.8 Hz.> VK3III7MO QE37PC O/O <STOP>
RX: <02:41 UTC> <9.8 Hz.> VK3II VK7MO QE37PC SOO <STOP>
RX: <02:45 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <STOP>
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-28 dB

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RX: <02:48 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <STOP>
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RX: <02:50 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <CANCEL>
RX: <02:53 UTC> <9.8 Hz.> VK3II VK7MO QE37PC M!O <STOP>
RX: <02:56 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <STOP>

-29 dB

RX: <02:59 UTC> <9.8 Hz.> VK3II VK7MO QE37PC>4OO <CANCEL>
No Frame Acquisition
RX: <03:05 UTC> <9.8 Hz.> VK3II VK7MO QE37PC OOO <STOP>
RX: <03:08 UTC> <9.8 Hz.> 4A?TI VK7MO QE37PC OOO \$HGW <CANCEL>

-30 dB

No Frame Acquisition
RX: <03:13 UTC> <9.8 Hz.> VK045 VK7MO QE37V# %?O<CANCEL>
No Frame Acquisition
No Frame Acquisition

While there are some errors in the ROS decoding at -26 and -27 dB it is still giving about 50% correct decodes at -28 and -29 dB which is similar JT65a in the Deep Search mode. Following the signal generator tests a brief tropo-scatter test at 250 mW was conducted between VK7MO and VK3II over a 520 km path with ROS version 2.2.4 in EME mode with the results below:

250 mW ROS

RX: <23:15 UTC> <0.0 Hz.> VK3II VK7MO QE37 OOO <STOP>
RX: <23:17 UTC> <0.0 Hz.> VK3II VK7MO QE37 OOO <STOP>
RX: <23:22 UTC> <0.0 Hz.> VK3II VK7MO QE37 OOO <STOP>
RX: <23:25 UTC> <0.0 Hz.> VK3II VK7MO QE374\$\$KJ9?=<STOP>
RX: <23:32 UTC> <0.0 Hz.> VK3II VEM6GT?W#XIM4C\$*QO=<CANCEL>

250 mW JT65a

233900	1	-25	-1.1	0	3	*	VK3II VK7MO QE37	0	10
234000	5	-23	-1.6	0	3	*	VK3II VK7MO QE37	1	10
234100	1	-27	-1.1	0	12	*	VK3II VK7MO QE37	0	10
234200	1	-25	-1.1	0	3	*	VK3II VK7MO QE37	0	10
234300	0	-30	3.9	0	18		NIL DECODE		
234400	3	-25	-1.2	0	3	*	VK3II VK7MO QE37	0	10

While tropo-scatter varies considerably such that many more tests would be required to achieve reliable results this initial testing does suggest that ROS provides comparable performance to JT65a on tropo-scatter and may be slightly better if there is no prior knowledge of the callsigns.

As this report was being finalised a further new version 2.2.5 was released so things are changing very rapidly.

Please send any Digital DX Modes reports to Rex VK7MO

The Magic Band – 6 m DX

Brian Cleland – VK5BC

February provided some good Sporadic 'E' openings early in the month and then late in the month the 1st TEP openings for a long time with one excellent opening from VK4 to JA.

On the 3rd Feb a good late afternoon early evening opening from VK5 to ZL, VK1, 2, 3, 6 & 7 which extended from VK6 to ZL in the early evening with Kerry ZL2TPY working several VK6's. During the opening Norm VK7AC worked Kaz VK8ZKZ in Alice Springs, good to hear a station active from the Alice area; it has been very quiet since Jeff VK8GF moved back to SA. Also good to hear Rick VK6XLR in Geraldton WA, Grid Square OG71hf back on the air and active on 6m. This is a reasonably rare grid square and he is currently the only 6m operator in the area and Rick reported he worked John VK1JST 55, Bob VK2ABP 56, Ken VK3AKK 57, Norm VK7AC 59, John VK7XX 57, Noel VK3FI 57, Alex VK5ALX 57, Brian VK5BC/p 55, Roger VK3FZ 57 & Gerry VK2APG 57 during the opening. Rick says 'not bad for 60 minutes work and his first 'dogpile' and apologies to those who missed out.

The morning of 10th February the band opened early with very strong signals from VK5 to VK4 Brisbane area. Brian VK5BC completed good contacts with VK4's FIL, JMC, DDC, ID, TBW/m & RY & WTN, ACE, WM, & CC. Same morning Brian VK4EK in Saffire worked David VK3AUU and Bob VK3ZRT and Col VK4CC had several contacts into VK3 & 7. Col reports he was in QSO with Mike VK3KTO when they heard Ken, VK3ZER in Bonbeach, Victoria call. We were Ken's first ever 6 m contact which was both a surprise and an honour, even more so when Ken revealed that he was running 6w into a double bazooka at 6' above his gutter line. The double bazooka was broadside east/west and Ken was a solid 5x4 to Logan City, Queensland. Always good to hear of new stations on 6m and hope this contact may encourages Ken to become a regular 6m operator.

Received a note from Bernie VK4KAC Sunshine coast reporting on his January 6m activity:

'Apart from working A35A on and off through the month I was lucky enough to work VK9NA on the 3rd of Jan at 21:35 on 6m not long after they came up on air at 5x3 but the signal lifted shortly after our contact to S9 and then just as quickly as they came up they were gone and the Southern boys got to work them.

A bit later in the day at 02:40 I worked VK4APE in Charters Towers for a new Grid on 6m @ 5x5, and then went on to work Dave VK9WBM on Willis island for yet another new grid on 6m @ 5x5, then to cap off my day I worked 3D2JS on 6m also @ 5x5 both ways for yet another new grid.

All in the same day which I was very pleased with, I also worked a number of stations on 2m SSB but I haven't listed them.

I believe that 3D2JS was using a loaded up 20m wire dipole on 6m.

Below is my list of stations worked on 6m for January 2010, some of them more than once not a lot but I wasn't always at my station.

VK1DJA.

VK2APG, KNS, BHE, ADM, AH, ARA, BGL.

VK3AUU, AIG, HJ, CCR.

VK4APE (some locals not listed)

VK5DK, GA, ZK, PJ.

I did hear A VK6 come up briefly and go.

VK7PD, XX, AN.

ZL2AO.

E51A Beacon was heard several times but haven't worked him yet.

VK9NA, VK9WBM.

3D2JS.

A35A.

Not bad from a vertical at 6.5m, as the beam was down for repairs.'

Steve VK3OT in Western Victoria experienced a good TEP opening to Japan early evening on the 21st Feb and reports at 07:30utc he was hearing VK8RAS/b weakly and then as the TEP extension kicked in at 08:00utc JA6YBR/b 50.017 peaking 599. Steve then worked the following stations all on CW:-

08:09utc JA6AZU 110 PM51mp
08:10utc JG3LEB 110 OSAKA
08:13utc JA6JNF 110 PM53eo
08:15utc JH3LBD QSY 105 Koh Hyogo PM74
08:16utc JA5FFJ 50.105 Take PM63un
08:17utc JE6URC Taka Kumamoto
08:18utc JA6WJL Nagasaki
08:19utc JE6KJT
08:21utc JA6GWX Fukuoka
08:22utc JF6TAC
08:23uc JH6CDI Nagasaki
08:24utc JR6EXN Hide Fukuoka
08:25utc JA4DWR Taka PM63 Yamaguchi
08:25utc JA6KTY Kei Fukuoka
08:26utc JA3APL Take Kyoto
08:29utc JA6LYY
08:33utc JA4FM Aki
08:35utc JH6MXY
08:36utc JA3EGE Ken Osaka
08:40utc JA1RL WJST 50.195

The JA6YBR/b was still 579 08:50utc but fading and at 10:00utc the VK8RAS/b faded out.

On the 24th Feb the best TEP opening for over a year to Japan from an area covering VK4 (Mackay south) to northern VK2 occurred. Brian VK4EK in Saffire reported:-

Heard weak SSB 03:35 utc on 50.110.

Band to JA opens 03:37 utc with JA1RJU worked with 5/9++ both ways. (weak SSB and then bang! 5/9++ signal.)

Band closes at 06:13 utc.

Worked 33 JA's in that period, most signals 5/9 and some 5/9+ . Could have worked many more JA's but had a few breaks and spent time listening for HL's, etc.

Worked JA areas 1, 2, 3, 4, 7 & 8.

Heard one very weak BY??? call on 50.110, but too many JA's on the frequency.

When the band opened both 49.750 and 43.650 were 5/9 and stayed that way most of the times I checked, same as last winter JA TEP opening when I worked a few JA's.

During this opening Paul VK4MA in Hervey Bay reported working over 100 JA plus 2 x HL (Korea) stations and stations in the Brisbane area and Mike VK2OT near Grafton worked several JA's.

Another good TEP opening from Northern Queensland on the evening of 27th Feb. Gary VK4ABW reports:-

The Chinese TV on 49.750 was rising fast at 0600Z so I started calling cq on 50110. At 0645z, Willem DU7/PA0HIP answered me and we quickly exchanged a 5/5 report. About 5 minutes later Willem was up to S9 and still calling so we exchanged 5/9 reports, with Willem then qsy'ing down to 50.105 leaving 110 clear. I put out a few more calls but the Chinese TV was going down rapidly so I gave it away. Then at 1000z I heard the 49.750 TV rising again and reached 30 over 9 shortly after. A check for beacons revealed the JA2IGY, JA6YBR & JA1ZYK beacons coming in nicely @ 1043z, so I put out a CQ on 50.110 and was immediately swamped by JA's. I qsy'd to 50.130 and proceeded to work JK1NMY, JO3DDD, JA6UDI, JE2LDW, JH7GYG, JN1GHS, JA1GHR, JL4DJM, JE2EHP, JA2IVK and JE6DOI from 1044z till 1100z. I then did another quick check of the beacons, which were pounding in at S9 so it was back to 50.130 to call QRZ. I then worked JA6WJL, JH4ADV, JF1UVJ, JE2KUC, JH6BPG, JG3LGD, JM1TWR, JE3PCP, JA1SFL, JA4DLP, JA6BDB, JH1NYM, JH4DYP, JR3JFZ, JR4IMV, JK3NSD, JE6HJT, JQ3DUE, JA3EGE, JA1QVM, JA1BAN, JA6KTY, JA3MNC, JA4SVS, JR1EMM, JR3KQJ, JM1WBB, JA6TEW and JA2CXH from 1102Z till 1153Z with many stations 5/9 plus. I could hear the band shifting west (typical for evening TEP) and a cursory check for beacons revealed the JA beacons were going down. I then spotted the Okinawa Island beacon coming in 5/5 and was completely surprised to hear the Hong Kong beacon on 50.075 at S3. Another quick call on 50.130 netted JH3DMP and JM1SGJ at S2 and S3 respectively at 1157Z. I then checked 50.110 and could hear the JA's calling but decided not to respond as the band was now shifting very quickly. I then spotted some SSB on 50.115 (IC7700) and went to investigate finding VR2XMQ at S5 calling CQ. We exchanged reports at 1215Z and I stayed on frequency but didn't hear him working anyone after our contact. We chatted for a few more minutes around 1225Z before finally giving it away. I then qsy'd back to 50.110 and worked JE6AZU at 1240z S7 for my last contact that evening. The JA's were still calling at 1330z but were extremely weak by then.

On the same evening (27th) Stuie VK8NSB in Darwin who has put up a 3el yagi worked Joel KG6DX Guam.

Norm VK3DUT's reports a good summer season and in between his work commitments working many stations including 9V1TT Singapore and VK9WBM Willis Island as new ones. Norm is he now using 4 x 7el Quads, picture below.



Adam VK4CP has recently released another update of VK LOGGER (www.vklogger.com) and if you are interested VHF/UHF activity in VK it is definitely a site you should visit.

Finally sunspot cycle 24 is picking up and we are starting to see some interesting conditions as reported above on 6m and it will be interesting to see what March/April brings us. Keep a lookout on VK LOGGER.

Please send any 6 m information to Brian VK5BC