
VHF/UHF – An Expanding World

David Smith VK3HZ
Leigh Rainbird VK2KRR

Weak Signal

David Smith - VK3HZ

Summer is the season for good propagation on the VHF/UHF bands, and so far this summer has been spectacular, particularly between the east coast and New Zealand.

On 16/11 Ross VK2DVZ in Cundletown worked Nick ZL1IU, Steve ZL1TPH/p, Bob ZL3NE and Steve ZL1TWR on 2 m, ZL1IU on 70 cm and ZL1TPH/p on 23cm (after Steve did the one hour round trip to home to get the 23 cm gear). Steve ZL1TPH/P also worked Neil VK2EI on 2 m.

On 20/11 in what was possibly a sporadic E opening, Guy VK2KU worked Nick ZL1IU on 2 m. Nothing heard on any higher bands.

On 18/12, Gordon VK2ZAB worked ZL1IU, ZL3TY, ZL3TJZ, ZL2TAL and ZL2IP on 2 m and ZL1IU on 70 cm. Guy VK2KU worked ZL1IU, ZL3TJZ, ZL2TAL and ZL3TY on 2m. Remarkably, stations from the Bay of Islands in the far north of ZL down to Greymouth half way down the South Island were all workable at the same time.

On 19/12, Gordon worked ZL1SWW on 2 m and Ross VK2DVZ worked ZL1IU and ZL1TPH on 2 m and ZL1IU on 70 cm.

Then, on 30/12, one of the most extensive and long-lasting ducts in memory (at least, in the memories of those involved) commenced over the Tasman Sea. So many stations were worked at each end on all bands from 6 m to 23 cm that it is difficult to acknowledge them all.

Bob ZL3TY reports on 30/12, working VK2FZ, VK2JXA, VK2DXE, VK2TK, VK2AWD, VK2TS and VK2TDN on 2 m. On 31/12, he worked VK2FZ, VK2DXE, VK7MO (FSK441), VK2AWD, VK2DVZ, VK2TK, VK2ZAB, VK2KU, VK2JXA, VK2TG, VK2APG, VK2BHO, VK2AAS/p, VK2BZE, VK2ZXC, VK2FHN, VK2BA, VK2TS, VK2UBF, VK2FHN, VK4APG, VK4LC, VK2JJK, VK2EAH and VK2GKA on 2 m and VK2DVZ, VK2TK, VK2BZE and VK2FZ on 70 cm. He also worked John VK2TK using JT44 on 70 cm, setting a new Australian 70 cm Digital Record.

On 01/01, Gordon VK2ZAB reports working ZL2TAL, ZL2IP, ZL3TY, ZL1IU, ZL1TPH/p, ZL3TJZ, ZL1BK, ZL3UCP, ZL3ADH and ZL1AMO on 2 m and ZL3TY, ZL1IU, ZL1TPH/p and ZL3ADH on 70 cm. Signal levels varied between S2 and positively painful (ZL3TY). On the same day, Steve ZL1TPH reports working VK2ZAB, VK2KU, VK2DVZ, VK2DXE, VK2TK, VK4AR, VK4AML, VK4KZR, VK4LC, VK4QV, VK4OE and VK4DFE on 2 m and VK2ZAB, VK2KU and VK2DVZ on 70 cm and VK2DVZ on 23 cm. Guy VK2KU worked Ian ZL1AOX on 23 cm setting a new VK2 distance record.

On 02/01, Bob ZL3TY reports “just another average day”, working 1xVK7, 13xVK2, 6xVK4 and 3xVK3, all on 2m. Following his success on the previous day, Guy VK2KU teamed up with John VK2TK for a 23cm portable foray into the Blue Mountains. Once on site, with a clear view east and excellent conditions, gremlins crept into the equipment causing a nerve-wracking 15 minute delay. However, once the earthing problem was sorted out, Guy and John worked Ian ZL1AOX (2270 km) and Harry ZL1BK/p (2277 km), again setting a new VK2 distance record.

On 03/01, Bob ZL3TY again worked a large number of VK2 stations, including Rod VK2TWR. As the morning progressed, signals crept steadily further west into VK3.

Bob worked VK3EK, VK3DUT, VK3RS, VK3ZUX, VK3KAQ, VK3HZ, VK3ZYC, VK3KAI, VK3HY, VK3DMP and VK3FMD on 2 m and VK3EK on 70 cm. Robbie VK3EK also managed to work Ian ZL1AOX on 2 m and 70 cm. Andrew VK3KAQ worked Bob ZL3TY on 2m on JT44 setting another new Australian record (but not for long). After a lull in conditions, Bob re-appeared and worked VK3HZ and VK3FMD on 2m on JT44. He then worked VK3HZ, VK3KAQ and VK3FMD on 70cm. The two contacts with David VK3HZ set new Australian digital records on 2m and 70cm (2275.5km) and was the furthest west that the duct reached.

Finally, on 04/01, Gordon VK2ZAB reports working several ZL stations with signal levels dropping throughout the day. The duct was finally fading!

The duct to ZL had lasted 6 days and reached as far west as Melbourne, well inland into NSW and well into northern Queensland. That stations did not work across the Tasman on bands higher than 23 cm was probably only due to lack of operational equipment. Hopefully, we won't have to wait another 25 years for such an event.

On 08/01, 6 m displayed what was thought to be double-hop sporadic E. Ron VK3AFW reports hearing VK6JR working into ZL. Murray ZL3MH also reported VK6 to ZL contacts on 6 m. Denis VK3ZUX worked VK4FNQ, VK6HK, VK6ZKO and VK6DI and then the band went dead. Len VK3UH reports hearing both side of VK6 to ZL2 contacts. The ZL TV video carriers were very strong as was the Toowoomba sound carrier. John VK3ACA reported that there was strong E's ionisation over Sydney. Glen also reported MUF above 50 MHz. The propagation seemed to be more extensive than single hop, which is limited to about 2,200 km. Double hops do occur, but aren't anywhere near as common.

Barry VK3BJM has been busy working stations on 2 m and 70 cm while travelling from central Victoria to central Queensland and back in early December. Barry has a very good mobile setup in his vehicle with decent power and "big wheel" horizontally-polarised antennas on both bands – raising a few "looks" from passing traffic. Using a keyer to call CQ and taking advantage of aircraft enhancement, Barry managed contacts of up to 614 km on 2 m to Jim VK3II and 544 km on 70 cm to Gordon VK2ZAB – all while mobile! A good effort by any measure.

Several new beacons have been brought into operation recently. John VK3KWA advises that a new 23 cm beacon - VK3RTC - is testing at present. Ed VK3BG built the beacon using a UHF base station Tx followed by a varactor tripler and filter. It is located at Cobram (QF24) on 1296.534 running 10 W to an Alford slot. The current site is temporary (Daryl VK3KLN's QTH) and with any luck it may move to the top of a wheat silo.

Russell VK3ZQB reports that a new 3 cm beacon is running from the Mt Warnambool repeater site in western Victoria (QF11iq). VK3RWL is on 10.368538 GHz running 2 W to a double-sided slotted waveguide giving 10 degree beams to the east and west. Russell built the beacon using a modified 12 GHz commercial exciter followed by an amplifier of his own design. The keyer uses a modified PIC-controlled CW identifier designed by his son Jeremy VK3TFH. Russell has endeavoured to make the beacon easy to build. He will replicate the design and make a beacon for Mt Gambier to be completed and on air before the end of the year. Ralph VK3WRE has already heard the beacon from as far away as Mt Tassie in Gippsland. Please email reports on the beacon to Russell at vk3zqb@dodo.com.au.

The VK beacon list has just been updated and is available from the WIA web site at www.wia.org.au/beacons/Beacons%20VHF-UHF%202004-01.pdf

If anyone is interested in undertaking the first-ever activation of Christmas Islands on 2 m EME, there might be an opportunity in Nov/Dec 2004. David VK2CZ is planning an HF trip at that time and has a large 2 m antenna that he could ship over. There

are many EME stations keen to work VK9X. If you have a rig with some reasonable power (and maybe a WSJT/JT44 digital setup), and are keen to join David, contact him via email on k3hz@ieee.org.

EME

Doug McArthur – VK7MO

This is a summary and my log for the both weekends of the ARRL International EME contest. I ended up with a total of 48 QSO's X 27 multipliers. This is some 10 fewer than last year with the multiplier count down by 3. My total operating time was only 7½ hours some 8 hours less than 2002. This was due to the lack of European window and one NA window when I could not operate due to gale force winds. On both chosen weekends I had Moon Set minutes after the contest period began. The second window was short and the Moon elevation was too low in Europe for many. Low elevations are not a problem for me, though I naturally suffer longer periods of ground noise.

Stations worked include: UA3PTW, JW/SM2BYA, OH2PO, RL3LE, SM3AKW, DJ9MB, DF3RU, DL9KR, VK4AFL, JL1ZCG, HB9Q, JH4JLV, HB9JAW, JR9NWC, K5GW, JA6AHB, N9AB, N2IQ, KL6M, K2UYH, KU4F, K4EME, JH0WJF, K1FO, K0RZ, VE6TA, JA9BOH, KJ7F, OE3JPC, DL7APV, UA9FAD, SM2CEW, PA2CHR, SM5IOT, SP6JLW, ON5OF, OE5JFL, OK2BDQ, F2TU, G4RGK, OZ4MM, G3LTF, DJ3FI, DL1YMK, YU1EVY & G3LQR.

All contacts were completed without skeds, loggers, phone calls, spotting, digital modes etc. Just the good old fashion and most enjoyable 5 finger digit CW!

Conditions for the second part were interesting. The NA window I would consider "normal" although I noticed Steve K1FO and Trevor VK4AFL were using polarisation offsets way off the norm (for me) with greatly diminished signals (at times) indicating significant but well defined shift angles. The EU window was certainly different to normal where, at times, there appeared a 90° shift with H being preferred where V is norm. Peter SM2CEW and Hannes OE5JFL and I tried all polarizations and basically found all were equal and ill defined! From about 2230-2330 on the 16th Nov there were short periods of almost total black out followed by fast fluctuating polarisation changes the likes of what I cannot previously remember experiencing. Libration also became predominate. These periods lasted for up to 5 minutes at a time and it was strange to hear some one calling on "your frequency" when you stood by. Conditions were coming and going so quickly as to confuse many of us! Well that's over for another year with a (sadly) seemingly lower level of activity. I hope next year will see us "down under" getting a better go.

Digital Modes

Rex Moncur – VK7MO

New Digital Records

Tropo openings to Bob ZL3TY produced new national digital records using JT44. On 1 Jan 2004 John, VK2TK, extended Guy VK2KU's 70 cm record by 7 km to around 2060 km. On 4 Jan 2004, Andrew VK3KAQ extended Rex VK7MO's 2 m digital record by 100 km to around 2246 km. This was extended shortly after to 2276.8 km by David, VK3HZ, followed by a contact with Charlie, VK3FMD, just 1 km less. David, VK3HZ, then worked Bob, ZL3TY on 70 cm on JT44 to extend the 70 cm record to 2275.5 km. Charlie, VK3FMD, and Andrew, VK3KAQ, also worked Bob,

ZL3TY on 70 cm JT44. Congratulations to David, VK3HZ, who now holds both the national 2 meter and 70 cm digital records at 2275.5 km.

New Digital Mode

Joe, K1JT, has released beta versions of a new digital mode called JT65 that it designed to provide 3 to 6 db improvement over JT44 on EME. It can be downloaded at: <http://pulsar.princeton.edu/~joe/K1JT/>

The new mode is highly constrained to transmit only the minimum information required to complete a QSO and uses a 60 second TX/RX cycle compared to 30 seconds on JT44. The first version did not do the averaging effectively and was far less tolerant of frequency instability than JT44. In the latest version the averaging works effectively and there is an option of using different frequency spreads that are more tolerant to frequency instability. The different frequency spreads are called JT65a, b and c. JT65a is the most sensitive but requires the best frequency stability and it looks like JT65b is a good compromise and will become the standard mode.

A key advantage of JT65 compared to JT44 is that it uses pairs of tones to send the special messages OOO RORO, RRR and 73. These messages can be copied down to -30 dB with reference to 2.5 KHz passband and enable a contact to be completed very quickly once call signs are exchanged. The use of these special messages make the new mode a clear winner on EME. On troposcatter paths the higher level of QSB means that JT44 with its faster cycle time can take advantage of QSB peaks and tests to date suggest that JT65 may have little advantage. In the long run a version of JT44 which includes the special messages of JT65 might be the optimum for troposcatter propagation.

Guy VK2KU has completed an easy contact with the new mode on 2 meters EME. Leigh VK2KRR and Bill VK5ACY have completed in normal conditions on two meters over a near 900 km path. Chas VK3BRZ and Rex VK7MO have been working over a 600 km path on 70 cms with good copy down to 20 watts.

From Craig VK6JJJ: WSJT activity is continuing in the West with VK6JJJ, VK6KHD and now Phil VK6ADF. So far six pings have been received in Perth by VK6KHD from VK6JJJ in Karratha, and five pings received in Karratha by VK6JJJ from VK6KHD in Perth. The sked is Saturday and Sunday 23:00 – 24:00 UTC, now on 145.140 USB and any new stations are most welcome. Hopefully a QSO will be completed soon. (Late update: Phil and Craig have now successfully completed an FSK441 QSO – 922 km).

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

Happy New Year to all and hope 2004 brings some interesting openings to you in the months to come.

In this 2 & 70 FM DX edition, we will be covering a bumper two months of exciting DX activity that occurred during the months of November and December 2003. While there were quite a few more openings than space will allow here, I have listed some of the more interesting. Enjoy!

November saw the transformation of the weather conditions to allow summer type duct conditions to return to the southern areas of Australia. In contrast, it would appear that the VK4 boys are now not enjoying quite as good propagation in comparison to the previous few months.

It would also appear there have only been around 4 instances of major conditions with elevated ducts over the whole two months in the south, but there have been

quite a few days of extended local conditions that I know of and only around one decent full High pressure cell has made it through into the Great Australian Bight, the rest have all been partial areas of lower pressure, but mostly there has been an east west track of High pressure or multiple linked cell centres which can be a good thing.

In the South East, the first major summer duct was noted in the morning of the 7th of November. I think most operators still had the winter blues, as not to many operators surfaced. A few simplex contacts were made, some new repeaters worked.

Working simplex on 2 & 70 were Terry VK3ATS in Mildura into Leigh VK2KRR near Wagga @ 466 Km. Terry also worked the Wagga 2 m repeater. Brian VK5ZMB (now VK5UBC) at Gawler also worked VK2KRR on 2 m @ 764 Km. Brian had a comparable signal to Terry, around S9+10dB and we had a QSO for about half an hour.

Both 2 m and 70 cm repeaters had good signals in the south and the west from here. Some of the harder to get repeaters were dug out, such as Ballarat 438.475, Willunga Hill 146.675 VK5RSV and a new one for me was Port Lincoln 438.225 VK5RPL @ 1026 Km. On low power tests, Crafers VK5RAD was workable on just 2.5 watts @ 764 km.

The 12th was a bit more major and there were a few more people aware of the good conditions by this stage. Another early morning starter, around 2.30 am, produced some good results. From here, the opening covered most of the South East area, excluding areas west and north of Adelaide.

A report received from Brian VK5UBC (ex VK5ZMB) about the opening, indicated very good conditions from the Adelaide area across to the east and southeast. Brian reports - This morning was a beauty. Turned on at 6.30 am and I could hear repeaters from all across Victoria. Highlights were working 3NAJ & 3YDK via Mt Baw Baw @ 750 km, and working 3XDJ/m simplex near Wangaratta @ 698kms. Also worked Bill 3LY at Nhill simplex as well as thru several repeaters. Brian is only running 20 W into an 8 element yagi.

Another station that did amazingly well was David VK3XDJ. David was stationary mobile near Wangaratta in Victoria and was using a vertical omni antenna to work as far as the Crafers 5RAD repeaters in Adelaide on both 2 m & 70 cm. This is around 690 km for David. I believe David was also able to work the Mt Gambier 70cm repeater @ 513 km. David also worked Brian VK5UBC on simplex. Well done also to Bruce VK3AYM, north of Albury, being able to make it to Murray Bridge and Crafers in Adelaide on 2m. Being 725 and 753 km respectively.

Another operator, stationary mobile and in a rare radio location was Wayne VK2PDW. Wayne was at Hay in Western NSW. Wayne was using a vertical omni antenna and reported hearing signals deep into VK3 towards Melbourne.

George VK3HV just happened to be in the right place at the right time. George was acting as second operator at VK3BG's QTH near Yarrowonga at the time and claims to have filled a number of pages in his log book within a few days! As far as I can recall, George worked up around Wagga NSW and all around the western half of Victoria, and had some great fun in the process.

VK2KRR was able to work simplex on 2 m to Tony VK5ZAI in Kingston @ 672 km and also to VK3LY and VK3AEF in Nhill. Repeater areas around Adelaide and the SE VK5 areas were worked, as well as many in VK3. Some of the more distant examples on 2m are, Mt Gambier, Kingston, Barossa Valley and Bumbunga Hill @ 833km. On 70 cm, Summertown, Barossa Valley and Mt Terrible @ 778 km.

During the evening on the same day at about 1200 UTC, signals emerged from Frank VK6DM in Albany. Frank made it to the Crafers Adelaide repeater 147.000, a

distance of 1892 km. Frank also was able to get into Houghton, another Adelaide repeater on 146.850, a distance of 1900km. Rob VK5MM was doing the duty of providing Frank with signal reports into both devices. Nice to get some signals from VK6 to the east, well done Frank.

On Sunday the 16th, very early in the morning, some interesting contacts were made in the South East. This time conditions did extend past Adelaide to the west and north. Not a great deal of activity noted, but for those who were around, some astonishing simplex contacts were available. These contacts being, simplex from VK2KRR to John VK5ZTY at Eudunda, north of Adelaide. John's signal here was 5/3 @ 741 km. John was running with an 8 element yagi and only 3 watts! At the same time, Rob VK5MM at Mt Barker was a 5/3 signal @ 747 km. Rob was using a vertical omni antenna at roof height and down to 5 watts! Next up, Bill VK5ACY on Kangaroo Island, SA, was worked. Bill had a good 5/9 signal over the 893 km path using a 5 element. Over a slightly shorter distance, Bob VK3HBJ, near the Melbourne Ford Factory was also worked with a 5/5 signal here.

It was unfortunate that there were not more operators active on simplex for this opening, as conditions were quite extensive and strong as shown by the following repeaters. Barossa Valley 5RBV on both 2 & 70 was full scale @ 741 km, Port Pirie 5RMN was +20 dB @ 867 km; Port Lincoln 5RAC was +20 dB @ 1019 km; Central North 5RLH was +50 dB @ 833 km; Willunga Hill 5RSV was S9 @ 771 km; Berri 5RLD was +20 dB @ 601 km; Cowell 5REP was +60 dB @ 961 km; and Port Augusta 5RAE was +20 dB @ 913 km. Most of these could easily be accessed with minimal power down to 2.5 watts from here.

Being licensed for only two weeks at the time, Dion VK7YBI gave everyone a shake up when he was able to make a number of brilliant 2 m contacts from Burnie to the Adelaide area. Dion's contacts began late on Thursday night, the 20th of November, when he was able to make it through to the legendry VK5RMB Murray Bridge repeater on 146.875. This distance is 913 km for Dion who subsequently worked VK5HKS on the repeater. Around an hour later Dion made it to the Crafers 5RAD repeater on 147.000 @ 925 km where VK5UBC (ex VK5ZMB), VK5MM and VK5CQ were eager to reply back to the distant signal. Dion is running a 6 element yagi. Also making it through from Tassie was Paul VK7BBW in Launceston. Dion reports that Paul was making it through to VK5 at the same time, but Paul's signal dropped out an hour before Dion lost it. Since then Dion has made numerous contacts with the mainland and is planning on adding a second yagi to the tower to help with his DX quest and is also considering 70 cm.

In the first week of December there were some great conditions in the southeast, from VK7 to the mainland and around VK5. Brian VK5UBC had some great luck and repaid the favor to the VK7's by working back into the Tasmanian area from his portable QTH at Corny Point, southern Yorke Peninsula SA. On the 3rd, Brian worked Bill VK3LY simplex at Nhill with a 5/5 signal @ 450 km. Also VK3VTX via the Ararat repeater, S7 @ 600 km. Brian goes on to report - Much to my surprise at around 9.00am I started to hear Mt Barrow 7RAA in northern Tasmania, which is 1152 km. I heard VK7's talking on the repeater and then 7UK calling, but I could not get in. I worked Dion 7YBI via Crafers 5RAD repeater at around 11.00am, which is 925 km for Dion.

The SE VK5 and 7RAA repeaters kept coming in and out all day, and around 9.00 pm the SE repeaters were all S9 and I was hearing 7RAA and Mt Duncan 7RMD @ 1047 km. VK3's were working VK7's on the Tasmanian repeaters and I was able to eventually break in and work VK7LCW, VK7YBI & VK3ARC via 7RAA. Peter 7LCW reported he could hear me on reverse and we had a simplex contact starting 10.10pm for about 20 min's. Signals were only S1 to 2 but readable 5. My 1st VK7

and a distance of 1044 km. Brian is running two 5 element yagis and 20 watts from his portable QTH.

On the 23rd of December, Mike VK4MIK reports that conditions were slightly better. Mike worked simplex to John VK4FNQ in Charters towers @ 310 km. In the morning on the 24th Mike also reports being able to work the following more distant repeaters – Mackay 4RMK @ 559 km, Hodgson Range 4RHR @ 644 km and Springsure 4RSP @ 793 km. Well done to Mike for cracking the Springsure repeater, and also to Felix VK4FUQ who I believe also worked the same repeater, not a real easy path across all the mountain ranges.

Saving the best till last, Boxing Day, 26th December 2003 saw an extremely rare path that stretched east west across Australia's south. The duct became workable here at about 1600 z, in the usual way. Around 1900 z things started to move along with strong signals. Brian VK5ZMB was worked here simplex 4/3. Brian was also noted making a contact into the Canberra 146.950 repeater, noisy, but a rare path and over 900 km to the repeater, Brian was working VK1NPW.

At 2029 z, VK2KRR was hearing the Port Lincoln 70 cm repeater at a great 5/9 signal @ 1026 km. Next thing I know, at 2035 z, a strange signal is copied on 147.250. Very weak copy but this ends up being the Boddington repeater VK6RMS on Mt Saddleback, 126 km SE of Perth and a 2817 km signal path to VK2KRR. Being very early morning in the Perth area, it was not until 2144 z that Frank VK6ZGU at Wagin was confirmed as replying to VK2KRR's calls. By now the signal was S7 from near Perth and Brian VK5UBC was able to call in and was also eventually confirmed by Frank. The distance for Brian was an amazing 2062 km! Brian is 40 km north of Adelaide. Not long after hearing all the commotion on their normally quiet local repeater, Glen VK6IQ at Wandina around 45 km NE of Perth called in, Glen is approx 200 km north of the repeater. Glen thoughtfully went to notify any other stations of the opening, but could only find one, which was Doug VK6TDC in Perth. VK5UBC and VK2KRR both checked for VK6 direct signals on reverse, but nothing was heard. A number of other VK6 repeaters were said to have been heard, but none could be confirmed.

The opening to the Boddington repeater lasted around 3 hours, and was last heard at approx 2340 z. It should also be noted that the Boddington repeater is the highest repeater in VK6 at 590 masl. Thanks must go to the operators around the Mt Macedon repeater in Melbourne for realizing the significance of this contact and standing by while this opening was running, as Macedon is on the same frequency as Boddington.