VHF/UHF – An Expanding World

David Smith VK3HZ

Weak Signal

David Smith - VK3HZ

Spring has finally arrived and the weather has shown a marked improvement in this neck of the woods. It's time to dust everything off, check that all is working OK, fix those minor (or major) things that you've been putting off due to the cold weather and generally prepare for the busy summer DX period.

Spring VHF-UHF Field Day

One of the main season-opening events is the Spring VHF-UHF Field Day, this year to be held on the weekend of November 11th and 12th. Full details were published in last month's magazine. The event is open to both portable and home stations. For those going portable, please advertise your plans on the VK-ZL logger (www.vklogger.com) and the VK-VHF email reflector (https://mail.une.edu.au/lists/cgi-bin/listinfo/vk-vhf) to encourage others to either go portable or be active from their home station to provide some contacts. Let's have some record levels of activity this year, and use those precious VHF/UHF and microwave frequency allocations that we are privileged to have access to.

Tropo Opening in the Southeast

On August 28th, a slow-moving high-pressure cell was again responsible for a period of good propagation across the southeast corner of the country between VK3, 5 and 7.

That evening, Peter VK5ZLX was a big signal on 2 m into central Gippsland, easily working Rhett VK3VHF and Jim VK3II (S9). Brian VK5UBC also worked VK3II, although signals were nowhere near as strong. The following morning (August 29th) on 2 m, VK3HZ worked VK5ZLX (5/3), VK5UBC (5/1), Garry VK5ZK (5/2).

That evening, the Geelong 2 m and 70 cm beacons were being heard by both VK5UBC and VK5ZLX. Brian VK5UBC reports: "I worked Dion VK7YBI (950 km) on 146.5 FM and then a little later, I called on the Mt William 2 m repeater and Paul VK7BBW came back. We QSY'ed to 144.1 SSB and completed a contact (994 km) with Paul's signal peaking to 5/3 here. Following this contact Peter VK5ZLX worked Paul at 5/9. Paul then worked several VK3's, including Vk3II". Later, Bill VK5ACY on Kangaroo Island worked Charlie VK3NX in Lara on 2 m and reported hearing the Geelong 2 m beacon at S4.

The following morning (August 30th), the opening appeared to have moved to particularly favour the Adelaide to Melbourne path. The Mt Lofty beacons on 2m and 70cm were both around S3 in Melbourne. Garry VK5ZK in Goolwa worked Kevin VK3WN and Ian VK3AXH in Ballarat (both 5/9+), David VK3HZ in Melbourne (5/9++) and Jim VK3II near Phillip Island (57). VK3HZ then worked VK5UBC on 2 m (5/9) and 70 cm (5/1) and Les VK5JL in Adelaide (5/2).

Beacons

As part of the spring clean in readiness for the summer period, it would be good to have an up-to-date list of active beacons around the country. One such list is

provided on the VK-ZL Propagation Logger (www.logger.com and click on Beacons at the bottom). However, the list is only as good as the information it contains. If you click on the "Report" heading, the list will be sorted into date order with the oldest reception reports at the bottom. Some of these reports are over 18 months old (e.g. Dural 23 cm beacon). Could people have a listen for beacons in their local area and, if necessary, provide an updated reception report, even if there is no change in the beacon status. That way, we can be more certain that the status information is correct.

Don VK6HK reports that both the Esperance and Albany 2 m beacons are off-air at the moment. Hopefully they will be restored to operation shortly, as they provide a very valuable service to the eastern states, indicating the state of the path across the Bight. The 70 cm beacon at Albany (Mt Barker) is fully operational and, in fact, often provides a much stronger signal to the east than the co-located 2 m beacon.

EME

Further to last month's report, Charlie VK3NX has managed to break the world distance record for 5.7 GHz EME. On August 28th, he worked Philippe F2TU - a distance of 16421.8 km.

The wind was blowing a gale and bouncing Charlie's dish around causing much QSB, and at the critical moment when "73" was expected, Murphy appeared and a fuse blew in Charlie's rig. So, although Philippe was happy that he'd received everything, there was some small doubt in Charlie's mind. So, the following day, the wind had disappeared and Charlie again worked Philippe, sending a 539 report and receiving 529. Congratulations Charlie.

Charlie reports that he has had several 5.7 GHz EME QSO's since then, working RW1AW (St Petersburg, Russia), W5LUA (Texas) and OE9ERC (Austria).

VK-ZL on 2.4 GHz

During summer, the ZL to VK2/4 path opens up fairly regularly with contacts on 2 m, 70 cm and even 23 cm becoming relatively common. However, the path has not been worked on any higher bands. Recently there has been a push for stations well positioned at each end to become operational on 2.4 GHz in a common frequency band. One small problem has been that the VK and ZL band plans allocate different frequency segments for weak signal operation for the 2.4 GHz band – 2403 MHz for VK and 2424 MHz for ZL. However, many of the ZL stations are able to work in either segment.

Steve ZL1TPH is pushing for more stations to become active:

Over the last two years, there have been a number of unsuccessful attempts to VK from ZL on 2.4GHz, between Brian ZL1AVZ, Nick ZL1IU and myself to Ross VK2DVZ and Adrian VK2FZ. At the time signals were weak on 1296.

There is interest here in ZL in working VK on 2.4 GHz, brought about no doubt by the first contacts on 432 to VK by ZL1TAB many years ago, and at a later date with Brian ZL1AVZ to VK on 1296. Twenty years separated these two firsts.

Steve goes on to say that there are at least seven ZL stations that have good coastal sites with elevation and are active on all bands, 144, 432, 1296 and 2.4 GHz – Brian ZL1AVZ, Ralph ZL1TBG, Ian ZL1AOX, Ted ZL2IP, Nick ZL1IU, Steve ZL1TPH and Ray ZL2TAL.

Let's hope that the VK/ZL path can be conquered on 2.4 GHz this season, and on to higher frequencies.

Please send any Weak Signal reports to David VK3HZ

Digital DX Modes

Rex Moncur – VK7MO

Sam, RN6BN, with his massive 1920-element array is capable of working very small stations on 2 meters EME using JT65B and worked LZ1BB who was using only 40 watts and a 4 element yagi. This result indicates that EME is now within reach of very small 2 meter stations with a few tens of watts and a small yagi or even a medium gain omni-directional vertical. Sam can switch polarization to accommodate Faraday rotation and Spatial polarization changes and work stations with either vertical or horizontal polarization.

Rhett, VK3VHF, reports on his EME results with 100 watts and a single seven-element yagi. "I only received Sam, RN6BN, at -20 dB last night, I've heard him in the past down to -12 dB. But pretty cool report from him at -17 dB." Rhett has worked, W5UN, RA3AQ, RU1AA, RN6BN and EA6VQ. He says "So certainly you can have some fun with EME using a small station like mine. Just takes time, as I've spent hours trying. There are plenty of 'Big Gun" stations which I haven't worked yet, so my little station still provides me with plenty of interest."

Alan, VK4EME, using 80 watts and a single 10 element yagi on 144 MHz, completed his first EME contact with HB9Q.

Jim, VK3II, reports making JT65b EME contacts on 2 meters with a single 14 element yagi fixed on the horizon with HB9Q, DL8GP and DF2ZC. He also copied S51ZO, OE6IWG, YU7AA and JS3CTQ. Jim says "I hope I can get a good 2 metre array together that can be tilted up so I can get a bit serious about EME work."

Ian, VK3AXH, has made significant progress with 2 meters EME, since completing a four bay 18 element array and reports as follows: "My 1st EME contact was with W5UN on 21 August 2004 using a single 12el yagi and no elevation. A further 14 contacts were made using the single yagi until use of the new array began on 3 April 2006. The array is by DJ9BV and optimized by Lionel VE7BQH with all 18 elements of each yagi insulated from the boom. Only horizontal polarization is employed.

Total contacts to the end of August 2006 on 144 are as follows:-

	JT65B	CW	SSB
Grid Squares	84	2	1
Total Contacts	112	2	2
DXCC	24	2	1

Included in the above there are 2 CW and 2 SSB QSO's. Both SSB contacts were with RN6BN using his famous 1920 element array with Vertical and Horizontal Polarization. The initial SSB contact was tried after receiving signal levels of –6dB at both ends using JT65B on Saturday 26th August. Sam called me and I received him at 5X1 and he received me 4x4. We had 3x1 minute overs each. Sams log show this as the longest distance of 13,918Km in his list of 162 SSB contacts. On Sunday 27th August at around 0640 UTC Sam began calling CQ using JT65B alternating between Vertical and Horizontal Polarity. He was 8dB stronger on Vertical Pol to me. When I saw a level of –6dB I called him on SSB and was surprised to hear him come back

with a 5x1 report. I gave him 4x1. Its great fun and I look forward to many more EME contacts in the future on 2 metres and eventually some of the higher bands."

Jim VK3II has been experimenting with QRP JT65 over a 518 km tropo-scatter path to Rex VK7MO. Signals are consistent at 5 watts and contacts can be completed more than 50% of the time at 2 watts. Comparison tests were made with SSB at 300 watts where copy is marginal indicating that there is around 20 dB performance improvement with JT65B. Des, VK3CY, using JT65B, has been consistently working Rex, VK7MO, at 780 km with 50 watts and around 50% of the time can get through on 25 watts.

On 6 September, Trevor VK4AFL and Rex VK7MO achieved their goal of a 5 watt QRP EME QSO on 1296 MHz. Trevor uses a 3.7 metre dish and Rex a 2.3 metre dish. This follows earlier success at 10 watts with the new version of WSJT, version 5.9.5. The further improvement from 10 watts down to 5 watts seems to be largely a result of good moon conditions with the degradation close to the best possible, but an additional factor could be a new "Super VE4MA feed" with a circular waveguide and Septum Polariser that Rex was using. This design of feed was recently announced by W1GHZ (www.w1ghz.org/antbook/conf/VE4MA_Chaparral_septum_feeds.pdf) as a result of theoretical analysis and should give around 0.5 dB improvement over the standard VE4MA feed. The use of a Septum polariser also makes it far simpler to tune. Following the success at 5 watts, tests were conducted at 3 watts and while a QSO was not completed, several syncs were achieved both ways with one correct decode in the average.

Operating Hint: Sometimes when operating JT65 on 2 meters a meteor ping with just the right frequency offset for a shorthand RO, RRR or 73 will cause the program to incorrectly decode the shorthand message. The problem is readily identified by watching the waterfall display, but it still overrides the correct message. There is an option under the Decode menu to set JT65 so that it does not decode shorthand messages when you are using line one and by using this option you will often be able to decode the correct message in the presence of meteors.

Please send any Digital DX Modes reports to Rex VK7MO

The Magic Band – 6 m DX

Brian Cleland – VK5UBC

August has been a very quiet month on 6m. There have been very few reports of band openings from anywhere in Australia. Only openings I'm aware of are on the 21st August there was a opening between southern VK4 & VK5 and on the 2nd September Norm VK3DUT worked Steve VK5ZBK.

I've received requests for information of where to listen to assist newcomers to 6m. Below is a list of Australian, New Zealand and New Caledonian 6m beacons that are presently operational.

Australia

50.046	VK8RAS	Alice Springs	CW
50.058	VK4RGG	Gold Coast	CW
50.066	VK6RPH	Perth	CW
50.087	VK4RTL	Townsville	CW
50.288	VK2RHV	Hunter Valley	CW
50.289	VK2RSY	Sydney	CW
50.293	VK3RMV	Wannon	CW
50.297	VK7RST	Hobart	FSK

50.304	VK6RSX	Dampier	CW
50.306	VK6RBU	Bunbury	CW
50.315	VK5RBV	Barossa Valley	CW
50.345	VK4ABP	Longreach	CW
52.438	VK3FGN	Mildura	CW
52.450	VK5VF	Adelaide	CW

New Zealand

50.040	ZL3SIX	Christchurch	CW
51.030	ZL2MBH	Napier	FSK
52.275	ZL2MHF	Upper Hutt	FSK
52.490	ZL2SIX	Blenheim	FSK

New Caledonia

50.080	FK8SIX	Noumea	FSK

There are other beacons either planned or not operating at present, and I will advise of any updates. If your equipment has the capabilities it is worth programming the above frequencies into memories and regularly scanning them. It is surprising how often you will find the band opens and you hear a beacon. It is also useful to listen for Channel 0 TV, in particular, Toowoomba sound on 51.672 and Wagga sound on 51.740. The International call frequency is 50.110 and the Australian calling frequency 50.200 with most SSB operation taking place between 50.110 and 50.200. For more information check the Australian Amateur Callbook.

Hopefully 6m will start coming to life during September.

Please remember to send any 6 m information to Brian VK5UBC