
VHF/UHF – An Expanding World

David Smith VK3HZ

Weak Signal

David Smith - VK3HZ

Once again, there's not much to report regarding unusual VHF/UHF activity.

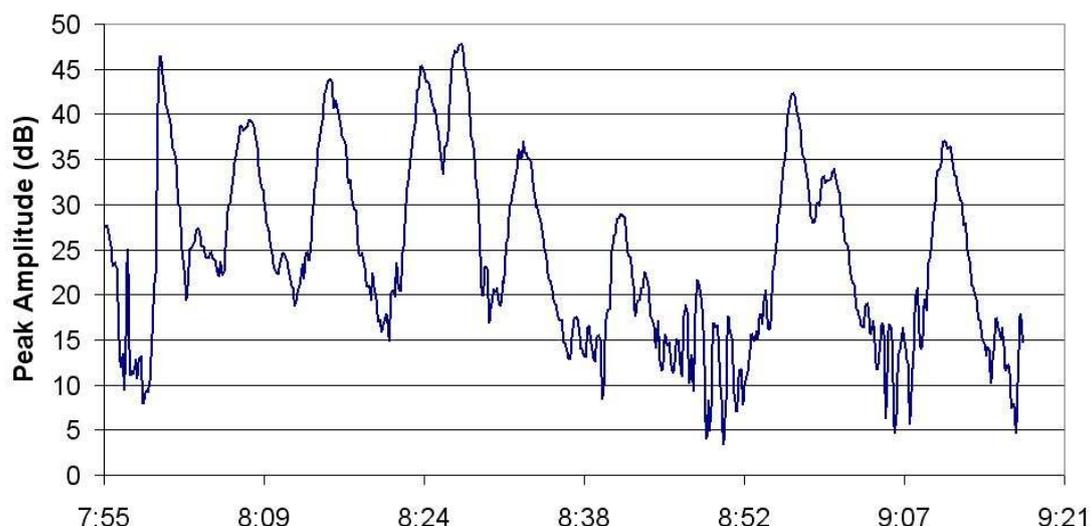
Of regular events, the local Net run by Mike VK3KH and Rob VK3MQ on 144.150 MHz at 2030 AEST each Wednesday is always well attended. The Scramble on 144.150 MHz held on the last Sunday of the month at 2030 AEST also draws quite a number of participants. In VK4, a Net is running on 144.3 MHz on Sundays at 1930 AEST.

The main regular activity is the daily Aircraft Enhanced Propagation (AEP) activity session from 0800 to 0900 AEST each morning on 144.2 MHz. So, it's perhaps not surprising that this month's column features a fair amount of AEP-related information.

AEP Tests

Of course, AEP only relies on aircraft and stations to be in the right places and so can be utilised throughout the year, regardless of weather conditions. The proliferation of aircraft flying the Melbourne / Canberra / Sydney / Brisbane routes means that AEP can provide quite substantial lift for favourably located stations up the east coast.

Following Gipstech this year, Rex VK7MO travelled up into the VK1/2 area with his portable 2 m station, ADS-B aircraft receiver and numerous laptops. He stopped at several locations and, using signals from Jim VK3II and David VK3HZ, he recorded frequency, levels and aircraft positions. The GPS-locking on all the stations enabled very accurate logging of the troposcatter and doppler-shifted AEP components of the signals. While more tests and further analysis is to be done, the initial results provide evidence of the significant amount of signal lift that AEP can produce. The graph below shows signal strengths between Jim VK3II and Waldis VK1WJ's location – an almost ideal path for AEP using aircraft flying the busy Sydney to Melbourne route.



At one stage, Rex parked his station in the town of Batlow in southern NSW. Batlow is surrounded by hills and is far from being an ideal VHF location. However, the

Melbourne to Sydney flight path goes directly overhead. Rex reported hearing nothing of my 20-watt signal via normal troposcatter. However, when an aircraft appeared overhead, the signal peaked to 50+ dB above the noise.

What this means is that if you live in an RF "hole" (as I did in my early years in AR), don't give up on VHF operation. If you can "see" (in an RF sense) aircraft flying past (even quite distant), then it's quite possible that you'll be able to use AEP to contact others. The ideal situation is where an aircraft crosses the path between you and the other station, is RF-visible to both stations and is close to the mid-point. However, AEP also works to a lesser extent for reflections off aircraft in any direction.

At risk of beating my own drum, I'd suggest that anyone interested in analysing their prospects for AEP should have a look at the Radio Site Display - information on www.vk3hz.net - and particularly the use of PlanePlotter.

VK3AUU Mobile

Continuing on with the AEP theme, David VK3AUU recently operated portable/mobile on 2 m from central NSW. He was using only 50 watts from an IC-706 into a halo antenna, so some assistance was required to work him from southern VK3. This assistance was in the form of AEP. Barry VK3BJM takes up the story:

Tuesday 28/7/09

David VK3AUU was operating portable (well, stationary mobile, perhaps) from near Neckarboo Station in Central NSW (QF27hw) - about 100km NNE of Ivanhoe. He operated from a small rise near the homestead.

I was late home from work, and didn't switch the radio on until 1055z. I heard Rob VK3XQ, Jim VK3II and Michael VK3KH on 144.1 MHz, but there was no sign of David. Jim made mention that David was also liaising on 3695 kHz, so I shot over there - whilst tuning up the quad, I was also firing up the SBS-1 ADS-B "Radar" receiver. The SBS-1 came online before the quad, and the first thing I saw was a QANTAS flight, QF566, from Adelaide to Sydney, at 41,000'. It was nearing the Vic/NSW border, just NW of Swan Hill. I joined Jim and David on 80 m, just as David was suggesting he was about to shut down for the evening. I told them of the flight and David agreed to hang in there a little longer

At about 1124z, the receiver suggested the aircraft had crossed over the heading from my QTH to David (2 degrees). Jim, Michael and myself had been calling regularly. Finally, at 1126z I heard David and called him. He gave me a 52, and I gave him a 41. As would be expected, due to the aircraft cutting across the path at nearly 90 degrees, the period of enhancement was very brief. David later advised he also heard Michael and Jim, but David's signal was too weak to be readable in lower VK3 - it's a long haul for 50 watts and a halo... David is about 574 km from my QTH and it would be another 100 km, and a good deal more of the Great Divide, to work over for those in Melbourne and environs.

David advised before shutting down that he would be back on for the usual AE "net" window Wednesday morning (2200-2300z), as well as Wednesday night.

Wednesday 29/7/09

I was in my shack on time this time and David was again on air on 144.1 MHz, liaison on 3.695 MHz, between 1000z and about 1110z. Jim VK3II and Michael VK3KH were both on again, and Steve VK2ZT was looking Neckarboo-way. Leigh, VK2KRR, also popped up just after 1030z.

There were a number of aircraft criss-crossing the path during the hour, but this only aided in increasing the number of near-misses rather than contacts, it seems. David

made quite a list of moments where he heard Jim, Michael and myself. The ADS-B receiver showed that we'd just missed QF582 (Per>Syd), but that QF774 (Ade>Syd) was about 10 minutes from being in position. I also had LOS with JST452 (Ade>Bris), despite it crossing the path 3/4 of the way to David - 445km from me, and about 129 km from David. It was at 37000', and I figured that if I could get the 1090 MHz signal from the aircraft, I may as well give it a blast on 2 m... It caused some lift, but not a lot - this was at 1028z. Just before that, QF719 (Can>Per) had passed over heading west. In what was an interesting sight on the SBS-1 screen, QF774 (at 39000') passed directly over QF719 (at 36000') - a mere 3000' separation!

Next up we had the pair of QF583 (Syd>Per) and VOZ569 (Syd>Per). QF583 provided lift for a comfortable contact between Leigh VK2KRR and David at 1039z. By 1052z it was in position to provide me with lift, with a 41 given to David and a 52 received from him. At 1059z the Virgin flight brought David up again, this time only to 31. VOZ569 was cruising at 36000', whereas QF583 was at 39975'...

Afterwards, on 80 m, David suggested he'd be returning to Neckerboo another time, and next time he'd pack a yagi - maybe 10-el. His location was about the same distance from Sydney and Adelaide/the Barossa as it is from Melbourne - around or less than 700 km.

Thursday 30/7/09

At 1000Z, David appeared on 3.695 MHz advising that he was now about 15 km south of Mount Hope in QF27wa. This put him about 490 km from my QTH, and 607 km from Jim VK3II. Steve, VK2ZT, also popped up on 80 m to advise he was looking David's way.

At 1028z, QF583 (Syd>Perth) crossed my beam heading, 340 km from me and cruising at 38000'. Again, this aircraft was located 2/3 of the way to David, but still with direct LOS to my QTH. Reports of 51 and 52 were exchanged. Jim VK3II also worked David - a new grid locator for him.

David then agreed to trundle about a kilometre south of the railway line, putting him into QF26. By this time, we'd been joined on air on 2 m by Michael VK3KH, and Phil VK5AKK had made it known via the Logger that he was listening for David.

A few more aircraft started to appear. At 1101z, Virgin flight VOZ569 (Syd>Per) crossed over at the same spot and altitude as the earlier QF583; David and I managed an exchange of 41 both ways. By this time, however, it was too far west for Jim or Michael, and I suspect it was too far north to be visible to them. However, at 1122z, QF566 (Ade>Syd) was located well enough to enable Jim to work David with a report of 41. The aircraft was probably about 410 km from Jim, at 41000'. Michael was heard by David, but was unable to complete.

The most interesting observation I made was that, for the combination of halo at David's end and Yagi at my end, contacts were more easily afforded when the aircraft was located 2/3 to 3/4 of the way from our location to David's location - rather than the path mid-point. We still had visibility of the aircraft - but perhaps the elevation pattern of the Halo meant David "saw" the closer aircraft better than those closer to the horizon.

New Stations on 13 cm

The number of stations now active on 2403 MHz is increasing almost by the month, which should provide some lively activity for the upcoming VHF/UHF Field days. Peter VK3TPR is one of the newest additions and writes:

Today (25/6), I made my first contacts using my own 13 cm equipment - a Minikits

transverter that I recently built, a 600 mm x 900 mm Wi-Fi grid pack dish and a Yaesu FT-897D for a 147MHz IF.

To ensure a good chance of making my first contacts, I chose a line of sight path from Arthurs Seat (QF21lp) to Alan VK3XPD's QTH about 70 km away and mostly over water. As luck would have it, Michael VK3KH's QTH is almost directly in this path and a little less than halfway to Alans' QTH.

After setting up on one of the lower lookouts on Arthurs Seat (best to keep away from the tourists at the Peak Cafe) with both 13 cm and 23cm transverters, I tuned to both of Alans' VK3RXX beacons on 1296.530 and 2403.530 and was getting about S3 to S5 signals. Looking good so far...

I then tuned to 2403.1 only to find the frequency in use ... but it was only Alan talking to Michael. Alan was 5/9+20 and Michael was about 5/1 off the back of his dish.

I quickly got into the conversation and received 5/9 reports from both Alan and Michael, although I think Mike was beaming at his neighbours iron roof by this time - whatever works best, eh? Output at my end is only 50 mW into a claimed 24 dBi antenna.

Very satisfying indeed to make these contacts so easily today and makes me happy with the investment in the transverters.

On 23 cm, I received 5/9 plus plus reports using a 24-element yagi and 15 watts. Antennae were only about 2-3 metres above the ground although the Lookout is a cool 247 m above Port Philip Bay. Alans' signal to me on both 13 and 23 was 5/9 plus, plus, plus.

Column Online

I've been writing and collating this column for over six years now – how time flies etc. With the able assistance of Leigh VK2KRR, Rex VK7MO and Brian VK5BC, I hope that we've provided an interesting spread of information in the area of VHF/UHF operations.

I have put all the old columns up on the web site: www.vk3hz.net/vhf_column.

These are the raw files – the content and pictures (in colour) are the same as you see in the magazine but the layout is not as flash.

Finally, I'd like to once again appeal for input to the column. Anything you are doing regarding building, operating, experimenting, researching ... in the VHF / UHF / microwave area - I'd like to hear about it and pass on the information to others.

Please send any Weak Signal reports to David VK3HZ at ...

The Magic Band – 6 m DX

Brian Cleland – VK5BC

July continued to be quiet with some further winter 'E' openings and Meteor scatter contacts maintaining some interest.

On the 1st July Kerry ZL2TPY reported hearing several beacons including FK8SIX, VK4RGG & VK2RHV whilst VK2HN also reported the FK8SIX beacon. Unfortunately there weren't any contacts reported.

The best 'E' opening of the winter occurred on 8th July when the band was open for

several hours with several contacts between VK1, 2, 3, 4 & 5. Signals were of good strength with Rob VK1ZQR making several contacts whilst mobile in Canberra. From VK5 the band was open from as far south as Norm VK3DUT in the Gippsland area to John VK4FNQ in Charters Towers and many contacts were completed up & down the eastern coast.

Brian VK4EK at Sapphire in mid north Queensland reported hearing both the FK8SIX and VK3RMH beacons on the 9th July. Brian reported the beacons again on the 10th this time though completing several contacts with VK1, 2, 3 & 5. On the same day Kevin VK4BKP in Mackay also completed several contacts into VK2, 3 & 5.

The 11th July was also a good day for winter 'E's with good contacts completed from VK4 to VK2 & 5. Kerry ZL2TPY worked several VK2's and reported the VK5RBV beacon. Late afternoon the band opened from VK7 to VK6 with Glenn VK7AB working Jack VK6KDX and Glen VK6IQ.

Again on the 12th July the band opened from VK4 to VK2, 3 & 5. This time David VK4ZDP in Innisfail worked several VK1 & 2 stations whilst Andrew VK4KAY in Mackay worked Brian VK5BC.

On the 15th July Brian VK5BC reported hearing the ZL3SIX beacon over a long period of time and Brad VK2QO reported the VK5RBV beacon but there weren't any contacts completed.

The band was again lively down the eastern coast on the 17th July with several contacts completed to as far north as John VK4FNQ in Charters Towers and down as far south as Kevin VK3WN in Ballarat.

19th July saw the band open from ZL with contacts being made from VK2, 3, 4 & 7. Peter ZL4LY, Bob ZL3TY and Kerry ZL2TPY completed several contacts from Rockhampton to Hobart. The same day contacts were completed from VK4 to VK2 & 3. Again on the 20th the band opened from ZL to VK, this time Duncan ZL3JT worked Kevin VK3WN, Norm VK3DUT and John VK2BHO.

On the 23rd July the band opened from northern VK4 to VK2, 3 & 5 with Brian VK4EK completing several contacts whilst Brian VK5BC worked Tony VK2BTS in Grafton and Brian VK4DDC. The 24th was similar with Brian VK4EK completing contacts with Rob VK1ZQR & Dave VK1DJA and Brian VK5BC working Rod VK4CRO and Les VK4ALH.

Glenn VK7AB had good day on the 26th July working several VK4's while Ron VK4DD and Phil VK4FIL worked Kevin VK3WN, Brian VK3BBB and Mike VK3ALZ.

Meanwhile early on many mornings meteor scatter contacts have been completed and Brad VK2QO reports:

July Meteor Scatter on 50.200 MHz

On the mornings of the 6th: John VK4ZJB 5/9. 10th: Brian VK4EK 5/2, John VK4ZJB 5/5. 11th: Scott VK4CZ 5/1.

18th: John VK4ZJB 5/29. 21st: Glenn VK7AB 5/1. 22nd: Brian VK5BC 5/1. 25th: Scott VK4CZ 5/59, 5/2 and 5/2 three contacts made over 1.5 hours and Brian VK5BC 5/2. 26th: Scott VK4CZ 5/19. 28th: Glenn VK7AB 5/29. 29th: Brian VK4EK 5/1.

30th: Phil VK4FIL 5/19.

Most mornings VK5RBV and VK4RGG are heard with pings, bursts and burns. On occasions VK7RST, VK7RAE were heard but the best was VK4RTL at 1927z on the 31/7/09z (1/8/09).

There have been lots of contacts made between VK4-VK3, VK7-VK5 and VK5-VK4. Next month should be better with the Perseids at a rate of 100 hits per hour around

the 12th and 13th of August in the northeastern skies.

Peter VK6KXW and Gary VK4ABW regularly report being able to either hear TV carriers in the 49 MHz to 50 MHz area or see them on Spectran or similar programs from the northern hemisphere. Unfortunately no contacts have eventuated and we can only continue to wait for the next sunspot cycle to kick into action.

Peter VK5PJ celebrated his 50th birthday during the month and he is pictured below preparing to cut his cake which looked like a radio he once owned.



No need to worry, it isn't Peter's 6m rig covered in icing but in fact is actually a cake.

Please send any 6 m information to Brian VK5BC at ...