VHF/UHF – An Expanding World

David Smith VK3HZ

Weak Signal

David Smith - VK3HZ

The big news for the month is that the VK to ZL path on 2.4 GHz has finally been crossed. On the 27th January 2011, Adrian VK4OX worked Stephen ZL1TPH/P on 2403.1 MHz SSB over a distance of 2314.5 km. Adrian is located near Caloundra while Stephen was operating portable on a hill to the west of Auckland. Details of the milestone contact can be found elsewhere in the magazine.

This contact set a new distance record of 2314.5 km. However, the record was only to stand for less than a day as the following morning Adrian worked Brian ZL1AVZ to up the record to 2317.5 km. Shortly after, John VK4JMC also worked Brian, over 2305 km.

The audio recording of the VK4OX – ZL1TPH/P contact made by Adrian is interesting listening and indicates that it was a fairly easy contact with good signal strength for some time. I suspect that contacts may have been possible on 3.4 GHz and perhaps even 5.7 GHz. I wonder how long it will be before we bridge the gap on even higher bands.

VK9NA to ZL Microwave Contacts

Strictly, the VK4OX to ZL1TPH/P QSO was not the first VK to ZL contact on this band. It was the first *mainland* VK to ZL contact, but some weeks earlier, the VK9NA group worked Stephen ZL1TPH/P as he reports below:

To support the VK9NA VHF and microwave DXpedition to Norfolk Island, we drove to the top of New Zealand and operated portable out of a vehicle for the same two-week period. Two sites were chosen - Ahipara on the west coast and 838 km to Norfolk Island and Cape Reinga at the top of New Zealand and 748 km.

Our prime focus was the microwave bands from 23 cm to 3 cm with 144 MHz as liaison. Our station on VHF was 250 Watts to an 8 element horizontal Yagi on 2 m. With the microwave bands a 1.25 m diameter dish with 150 Watts on 23 cm, 100 Watts on 12 cm, 20 Watts on 9 cm, 100 Watts on 6 cm and 5 Watts only on the 3 cm amateur band.

Steve ZL1TPH with his Multi-band Dish

It became evident that, from either site, VK9NA were easily worked on 2 m at around

S2, but the conditions only provided marginal propagation on the 23 cm band.

Watching the Hepburn charts as the days went by, we saw what could be an intense inversion layer appearing on Sunday the 16th of January UTC at around 1800 or thereafter, with red on the Hepburn indicative of "Very Intense Propagation" between Cape Reinga up to Norfolk Island.

Arriving at Cape Reinga at 8 am, it was cloudy and misty and the humidity was extremely high with no visibility whatsoever. Initial contact on 2 m was not that strong at only S2.

We both decided to set up our respective 1.25 m dishes at each end, and then tested on 12 cm (2.4 GHz) with no success. We dropped down to the 23 cm and I locked my dish on the VK9NA signal - I had lost my accurate visual bearing marker in the mist.

With tests again on 12 cm, their beeper identification was easily heard, resulting in a weak SSB contact on 2.4 GHz at 10 am NZT. We then completed a digital QSO (FSK441) with signals becoming stronger.

At around 10 am ZL time or 2100 UTC our liaison frequency on the 2 m band surprisingly went up to S9 plus. It turned out we now had a three to four hour intense temperature inversion.

We now moved up to the 5.76 GHz band. The initial received signal from VK9NA was not strong but VK9NA was easily heard at my station at around 11:30 NZT. VK9NA could not hear my return transmission on 6 cm. I swung the dish only a few degrees to the north and VK9NA were now 57 and extremely loud on 5.76 GHz. We completed on SSB and Digital (JT65C).

Once that was complete we attempted a contact on 10 GHz or the 3 cm band. No signals were heard each way, but at the time the TWTA from VK9NA was not fully operational.

We then moved back down to 3.4 GHz. The VK9NA signal was easily heard and we completed on SSB. We attempted JT65C but it was soon evident that my transverter was not stable enough for this transmission mode.

We checked the 2 m band at around 2:00 pm NZT. Signals were down to S2 and the intense opening looked to be over. We tested 10 GHz again with VK9NA now having fixed their 100 Watt TWTA power amplifier, but nothing was heard either way. The intense opening to VK9NA, we believe, only lasted for around three hours that day, from 10 am to around 2 pm NZT on the 17th of January 2011. We both packed up our stations and I left Cape Reinga at 3 pm NZT for another 1.5 hour drive back to the Kaitaia motel.

The station operators, with the VK9NA DXpedition to Norfolk Island were Alan VK3XPD, Kevin VK4UH, Michael VK3KH and Andrew VK1DA. New Zealand amateur radio operators would like to thank the VK9NA team for activating Norfolk Island once again in January 2011.

VK5 Portable Microwave Operations

In line with the VK9NA operations, Colin VK5DK, Trevor VK5NC and Les VK5JL travelled to the northern coast of NSW with the hope of working across to Norfolk Island. Colin writes:

As the plans were to have VK9NA operational from the 8th January 2011, Trevor VK5NC and I left on the 6th January to travel to Port Macquarie on the North Coast of NSW in an attempt to make contact from VK2 to VK9 on as many VHF/UHF/Microwave bands as possible. We chose Port Macquarie as Les VK5JL has a residence there, so it was a central location for any planned operations to VK9.

We arrive on the 7th and quickly installed our 3-element 50 MHz antenna and 10-element 144 MHz yagis at Les VK5JL's portable QTH.

Mid afternoon on the 8th January, we were able to have a short Sporadic E contact to VK9NA plus working several VK3, VK5 and VK7 stations on 50MHz.

During the following few days we investigated several possible portable sites to give a good take-off to the north, south and east so as to be suitable for the VHF/UHF/Microwave Field Day. We checked out North Brother, which has a good take-off to the East, but no good north or south. Several locations were checked around Port Macquarie, with a possible good location found at the Tacking Point lighthouse. The problem at this location is that it is a popular scenic attraction with lots of visitors and locating portable equipment would be difficult. Crowdy Head lighthouse on the coast east of Taree was suggested and found to be quite suitable for all directions.

On Thursday afternoon 13th of January starting at 0230 UTC there was a very good Sporadic E opening on 144 MHz with several states worked from our portable home location in Port Macquarie. Stations worked included: VK5JR, VK7MO, VK5ZK, VK5NY, VK5AKK, VK5GF, VK5ZBK, VK5APA, VK9NA/P, ZL3TY, VK3DUT, VK3AUU, VK5BC/P, VK5ZPS, VK5GF and VK2ZT who was on normal Tropo.

Trevor VK5NC, Les VK5JL and myself VK5DK travelled to Crowdy Head lighthouse on the 15th January and with the help of Mark VK2AMS we set up for the VK VHF / UHF / Microwave Summer Field Day operations and managed 46 contacts on bands from 50 MHz up to 24 GHz in the 8 hr section. There was quite a lot of wind, which did not help operations, but contacts were made on all bands.

On Sunday 16th from our portable location in Pt Macquarie we were able to work Steve ZL1TPH via Sporadic E with S9 signals plus VK2IF at Kempsey also S9. Adrian VK4OX was also worked on 144MHz from his Maleny QTH, but nothing heard when attempting a 2.4GHz contact

Monday 17th January we returned to Crowdy Head lighthouse in an attempt to work to VK9NA on some of the microwave bands, plus have some contacts with Matt VK2DAG.

We were able to have contacts with Matt VK2DAG over the 210 km path on all bands from 2.4 GHz to 10 GHz with good signal on all bands, 24 GHz was attempted, but with no results.

While attempting to work VK9NA, the wind tipped our 1.2 m dish over and damaged the 2.4 GHz feed beyond repair plus some damage to the dish itself, so we packed up and returned to Pt Macquarie.

Since returning home to Mt Gambier, Colin has had a number of interesting contacts. He writes:

I have resumed tests on 10GHz with Russell VK3ZQB on a nightly sked with very good results. Also, on the 23rd January Rex VK7MO/P in QE48 was seen at our portable location QF02GG on 10 GHz WSJT, but no contact made. This was over a distance of over 800 km.

On Saturday morning 29th January, there were some very good S9+ signals received by Gary VK5JR and myself on 144MHz and 432MHz from VK7XX and VK7JG plus Karl VK7HDX mobile in Launceston was worked on his mobile with a ¼ wave whip at S2.

On Monday morning 31st January, Alan VK3XPD and myself had a 5 x 9 SSB contact on 10.368225 GHz over a distance of 380 km plus Ralph VK3WRE portable on Mt Tassie in Gippsland (QF31) a distance of 510 km was heard at S2 on SSB, but

not worked.

Summer VHF/UHF Field Day

The Summer Field Day in mid January was again well patronised in the southern part of the country. Unfortunately, the disastrous floods in Queensland meant that many had much more important matters to attend to up that way.

The VK2SMC team went out to their usual location in the heart of the Snowy Mountains. David writes:

VK2SMC completed a reasonably successful Summer FD for 2011 from our usual location near Mt Selwyn (QF43GV) - at 1610m asl. There was a weather issue leading up to the event but we were fortunate that the fog and rain cleared almost on cue, allowing us to assemble the station on Saturday morning without any major problems.

For almost the full 24 hour duration the weather was essentially perfect with clear skies, almost no wind and mild temperatures (14 - 22C). This was easily the best 24 hours of weather we have ever experienced at the QF43/P QTH.

Propagation was excellent too. To the west and south-west several VK5's were very audible for the entire 24 hours, which is very unusual over a continental path (floods excluded). During Saturday evening and Sunday morning we saw S9 signals from VK5 and we were eventually able to complete a 1.2 GHz contact with Phil VK5AKK, and also managed repeated 2 m and 70 cm contacts with Brian VK5BC/P - on the York peninsula. We also worked VK5 on 6m troppo??. This sort of propagation is far from normal - but very welcome on a Field Day weekend - even if the distance does not = points!

In total we managed to complete nearly 150 contacts on 4 bands combined, but we might have done far better on 1.2 GHz if the SSB preamp had been working. That was our only failure but it proved a crucial one - restricting the number of long haul stations worked on that band.

All in all it was a fruitful as well as enjoyable weekend, which only helps to keep the motivation factor high for next year.

Thanks to all that participated and particularly to those field stations that braved the high temperatures and high humidity at lower (normal) altitudes.

Cheers from the entire VK2SMC group - Dave, Rod and John.

We will definitely be up there again in 2012 come rain, hail, lightning or blizzards.

Mike VK1MC had a Field Day encounter from a different perspective:

I had a friend visiting Canberra from Melbourne this weekend and I did what any Canberran would do and set about showing her the local sights. In the middle of the day we decided to cruise up Mt Stromlo to take in the view and I spoke about the legacy of the 2003 bushfires on the mountain as we cruised past the burned out telescope buildings. I decided to pop up to the laser ranging station for a look and as we hit the top I saw a bloke surrounded by bits of recalcitrant aluminium trying by himself to build a radio station.

"VHF field day" I thought to myself and muttered the same to my puzzled friend. "I need to go and say hello." I said. She thought I was mad, but came along for a look.

I parked the car and walked over to find Greg VK1AI attempting to juggle a mast and fiddly antennae by himself. While introducing myself I grabbed the mast and together we chatted and assembled his selection of field day equipment. I managed to undo a nut and drop it to the ground while keeping track of it in the grass and rocks then finding it again... so I didn't make anything worse. :-)

With a bit of juggling and re-jigging we got his slot-fed over and under 2 m array up there below a 6 m vertical then clamped on a wee 70 cm yagi.

I'm still not sure how he'd have done this if I hadn't happened along at the critical moment but great respect to him for pressing on regardless. Here's what it looked like: http://goo.gl/UvJKj

We took a deep breath and Greg hooked up the power to the 2 m rig with a SWR meter in line. Power good. Cal good. Forward power good.

Reflected power... um... Hmmm. From my perspective, reflected power was Too Good To Be True (i.e. none) but I couldn't fault Greg's approach. He decided to "Give her a go" and immediately found Dale VK1DSH in Gundaroo. The proof of the pudding etc.

Thanks Greg thanks for sharing your site setup with a random bloke who showed up on the mountain.

Please send any Weak Signal reports to David VK3HZ

Digital DX Modes

Rex Moncur – VK7MO

A New 2 Metre Digital Record

Following the report of an almost new record in last month's AR, Derek VK6DZ and Jim VK3II completed a new 2 metre digital record on 21 January 2011 with JT65b signals up to -1 and -2 dB over a distance of 2497 km – congratulations Derek and Jim.

WSPR – report by Leigh Rainbird VK2KRR

A number of stations have begun to explore the use of K1JT's WSPR (whisper) mode on 144 MHz and more are following suit. WSPR stands for Weak Signal Propagation Reporter. WSPR implements a protocol designed for probing potential propagation paths with low-power transmissions (originally designed for HF). Normal transmissions carry a station's callsign, Maidenhead grid locator, and transmitter power in dBm. The program can decode signals with S/N as low as -28 dB in a 2500 Hz bandwidth. Stations with Internet access can automatically upload their reception reports to a central database called WSPRnet, which includes a mapping facility. The WSPR software is available from the WSJT software site http://physics.princeton.edu/pulsar/K1JT/ and the WSPR online database site is located http://wsprnet.org/drupal/

The following stations have been active using WSPR on 144 MHz during January VK2MER, 2KOL, 2KRR, 2XTT, 2EMA, 2QW, 2CDS, 2DVZ, 2BLS, 2DAG, 3SO, 3GHZ, 4LHD, 4FIL, 4VDX, 4JMC, 5GF, 5ZK, 5ACY, 5BC, 5LA, 5AKK, 6DZ and more.

Figure 1 shows a sample of the data you can find online about your signal or reception of others.

Timestamp	Call	MHz	SNR	Drift	Grid	Pwr	Reporter	RGrid	km	az
2011-01-22 02:16	VK6DZ	144.145496	-29	0	QF84ux	10	VK5BC/P	PF85mc	1759	95
2011-01-22 00:48	VK6DZ	144.145551	-24	-1	QF84ux	10	VK5BC/P	PF85mc	1759	95
2011-01-21 23:54	VK6DZ	144.145534	+7	-1	QF84ux	10	VK5AKK	PF94ix	1909	96
2011-01-16 22:52	VK6DZ	144.145571	-25	-2	QF84ux	10	VK2KRR	QF34mr	2657	96
2011-01-24 23:08	VK2KOL	144.145479	-12	0	QF56jf	50	VK5GF	PF94hk	1130	256
2011-01-24 22:52	VK2KOL	144.145483	-15	-1	QF56jf	50	VK5GF	PF94hk	1130	256
2011-01-25 03:46	VK5ZK	144.145560	-25	-3	QF56jf	20	VK2EMA	QF37qs	872	68

2011-01-21 07:00	VK3GHZ	144.145402	-15	1	QF56jf	5	VK2KOL	QF56jf	536	34

Figure 1: Sample of Data from WSPR data base

When on the WSPRnet site you will find it quite interesting to analyse the data and compare 2 or more stations reception of your signal in different locations. There have been numerous surprises for a number of stations finding signal paths they were not expecting to hear, such as the VK5GF to VK2KOL path was very interesting indeed, 1130 km over the inland and mountains.

The more stations active using WSPR the more interesting the data can become. If you have your 2 m SSB rig sitting idle, why not hook it up to WSPR and either let it log reception reports or you can TX also. Why not have a go? You may be surprised what you might hear or who can hear you, and have a bit of fun.

Note on WSPR Frequencies: While the above examples show the use of a dial frequency of 144.144 MHz, the Chairman of the WIA Technical Advisory Committee, after consultation, has decided that it would be more appropriate to use the international WSPR frequency of 144.489 MHz (dial frequency) in VK. This frequency is within the present beacon allocation but not on the frequency of any existing beacons. Advantages of using the international allocation are that this may open up international 2 metre DX opportunities and would also remove the possibility of mutual interference with SSB stations. The Band Plan has been amended accordingly. Under the guidance of Leigh VK2KRR, WSPR activity has now been transferred to a dial frequency of 144.489 MHz.

Mt Poimena QF48 Expedition

On the weekend of 22 and 23 January, Rex VK7MO and Joe VK7JG operated on 144, 432, 1296 and 10368 MHz to activate the rare grid square QE48 on the east coast of Tasmania. In most parts of QE48, VHF propagation is blocked to central and western VK3 and VK5 by mountains in northeast Tasmania, but Mt Poimena (see Figure 2) in the northeast corner of the grid offers the opportunity to work into these areas with an almost clear view across Bass Strait. However, there is no vehicle access to the summit and thus activation involved carrying all the equipment over about a 800 metre track to the summit – in total Rex and Joe made 10 return trips each or about 16 km each carrying often around 20 kg equipment – that is half a marathon each carrying equipment up a slope over rough ground – for a 69 and 66 year old.

Figure 2: Mt Poimena QF48 station

Aside from the fact that they both took off some weight, the radio results were excellent and many stations now have four new grids to their totals. The trip was planned primarily as a 10 GHz digital exercise but as it turned out the excellent take-off and some good conditions allowed most stations to be worked on SSB. In total 45 contacts were made including 11 on 10 GHz. The best distance contacts were VK5AKK 432 MHz SSB (1065 km), VK5DK 1296 MHz JT65c (725 km), VK3PY et al 10,368 MHz JT65c and SSB (469 km). The nearest miss was VK5DK on 10,368 MHz (725 km) with decodes one way on JT65c.

Please send any Digital DX Modes reports to Rex VK7MO

The Magic Band – 6 m DX

Brian Cleland – VK5BC

The 6 m band certainly lived up to its reputation as the “Magic Band” during January producing openings from VK/ZL to W, XE and KH6 as well as contacts from the eastern states to H44 and VK0 (Macquarie Is).

The first reports of US signals into Eastern Australia occurred mid morning January 11th. In the previous few weeks ZL1 and ZL3 had made infrequent contacts with Bob K6QXY who runs a 44 element array and an EME capable station, K6MYC and N5JEH but nothing had been heard in VK, but on the morning of the 11th Norm VK3DUT worked E51CG at 0010UTC and shortly afterwards at 0016 UTC started hearing the K6FV/b on 50.068 in Woodside California @ 519. This beacon runs 100 watts and a yagi antenna which at the time was directed towards the South Pacific. Norm then heard W0OGH on 50.115 CW, followed by weak W's on, 120,125 etc eventually working WA7JTM, AA7A. Norm completed a great morning by working VK9NA Norfolk Is. and H44DA Solomon Is.

Steve VK3OT in Hamilton noticed the report posted on the DX Summit and VK Logger websites by Norm and on tuning the 6 m band at 0035 UTC heard the CW signals from N5JEH in New Mexico USA on 50.105 running at around 579. Despite a

concentrated effort for some five or six minutes Steve could not break into this keyer so tuned up to the US call channel on 50.125 and encountered W0OGH in Gilbert Arizona DM43ii calling CQ on CW and a two way contact was completed. In the USA there was link up between west and east coast by mid winter E-skip and the appearance of VK and ZL into the USA produced a huge pileup on 50.125. Steve also worked AA7A as late as 0123 UTC and logged WA7JTM, K7TNT and W7KNT and heard N5JEH. Also Steve completed good contacts with N7CW in DM34rn, 13,850 km and also a triple hop F2 contact with K9HMB in EN52ri at 15,739 km.

The above contacts are the first into USA from VK3 since Cycle 23 in the year 2000/01, remarkable considering the solar conditions with figures of 83-6 and 1.

Meanwhile up in VK4 Wade VK4WM worked the following;

0120 UTC	AA7A	AZ	sent	559	rx	559
0129 UTC	WA7JTM	AZ	sent	519	rx	529
0137 UTC	N7RP	NM	sent	419	rx	559
0141 UTC	W0OGH	AZ	sent	419	rx	339

Paul VK4MA worked the following stations between 0100 & 0128 UTC;

N5JEH in NM, W0OGH in AZ, WA7JTM in AZ, N7IR in AZ, XE2D in Mexico, W7RVin AZ and W7XA in AZ.

Two days later on the 13th January Norm VK3DUT was in the action again, this time spotting the NH6P beacon on 50.045 at 0035Z and working KH7Y at 0056Z. The NH6P beacon was also heard in VK2, 4, 5 & 7 and many VK2, 3 & 7's worked Fred KH7Y. KH6SX was also heard.

From New Zealand Bob ZL1RS logged the following;

01Jan2011 E51CG as far as 3 x VK6's at almost 8300km ... not bad for 100W/5 element stations at both ends of the path!

03Jan2011 VK9L + all mainland VK prefixes 1-8 throughout most of the day.

04Jan2011 23:58 OA4TT for 1 hour signal between 529 and 559

07Jan2011 01:30 K6QXY weak

10Jan2011 00:27 OA4TT weak, QSO in JT65A only

10Jan2011 23:33 K6QXY weak in JT65A but 20 minutes later N5JEH 559 on CW as the band really started to open at the start of the 11Jan UTC day...

11Jan2011 The big opening to USA. There were 26 x W6, 7, 9 and 0 and 1 XE worked here between 00:15 and 01:35 UTC. I understand ZL2TPY heard the K6FV beacon and may have worked K6QXY?

12Jan2011 00:30 4 JAs worked at up to 579

13Jan2011 00:54 KH7Y and KH6SX worked with K6QXY between them for good measure!

14Jan2011 23:36 - 00:40 ZL2TPY reporting CE "muzak" on 48/49MHz

18Jan2011 04:47 - 09:30 good opening from ZL1/2/3 as far as VK6 for nearly 5 hours. Station worked here including a digital QSO to VK6OX with both ends running 5W. In fact signals were at the JT65 level "-04" and so were quite strong enough for an SSB QSO.

Shane VK4KHZ was on holidays in the Solomon Islands in early January and operated as H44DA. The 11th also proved a good day from the Solomon's and Shane provided many VK's with their 1st H44 on 6m working many stations down the east coast from as far north as Cairns south to Melbourne.

As can be seen from the above the 11th January was certainly an outstanding day both in VK & ZL.

Early in January Kevin VK0KEV Macquarie Island was worked by several VK3 & VK7 stations on 2 separate days.

The VK9NA DX expedition on Norfolk Island worked many VK/ZL stations on the 13th & 14th January.

Received a note from Greg VK8GM in Alice Springs saying he is active on 6m from the Alice and that on New Years Day he had 38 contacts. This included 2 x ZL and all VK states except VK6 & VK8.

From a Sporadic “E” perspective there were several good days where the band opening all over VK early in January but it started to fizzle out in the 3rd week of January with very few openings since then.

Please send any 6 m information to Brian VK5BC