VHF/UHF – An Expanding World

David Smith VK3HZ

Weak Signal

David Smith - VK3HZ

Things are slowing down in March but there are still times of good propagation driven mostly by the presence of a well-located high-pressure cell.

One such time was the morning of March 10th when a High was located to the southwest of Victoria, producing strong conditions between northern Tasmania and the Adelaide area. Bill VK5ACY worked Joe VK7JG (5x9 barefoot) and John VK7XX (5x9). Peter VK5PJ reports that the VK7 WIA broadcast on the VK7RAA repeater was competing with their local repeater, wiping it out at times. Peter was also hearing the VK7RAE 70 cm beacon peaking at 5x5 with strong QSB, although no 70 cm contacts were reported.

Another year-round technique for long distance contacts on VHF/UHF is via Aircraft Enhancement. The regular AE net of a morning from about 0830 to 0900 AEST is still bubbling along. From Melbourne, contacts are regularly had into Sydney on 2 m and into Canberra on 2 m, 70 cm and 23 cm. Steve VK2ZT regularly works Jim VK3II on 2 m along the Sydney to Melbourne flight path. Barry VK3BJM has a good alignment with the Melbourne to Sydney flights with Ian VK1BG and they regularly make contact on 23 cm, albeit for a short period before the aircraft passes the hotspot. Activity is also high to the north of Sydney up along the coast. If you want to know where aircraft are located in real-time and how AE might work for a given path, a good first stop is www.flightradar24.com. Peak AE will occur when the aircraft crosses the path between the two stations. The aircraft must be "visible" (in an RF sense) to both ends.

Wally Green VK6WG SK

As reported in the previous issue of AR, on March 7th, Wally Green VK6WG passed away at the age of 100. Wally was a pioneer of VHF/UHF in this country and has a long list of records and "firsts" to his name. Regularly when the band was open across to VK6, Wally would be at the other end. After I worked him for the first time in 2003, I was surprised when told his age as he sounded like someone half that age. He will be sorely missed.

Analysis of Two Metre Es Opening, 3 January, 2012

Roger VK2ZRH confesses to a mea culpa for an error in the April column under this heading.

On p.49, middle column, the paragraph beginning "The IPS ionosonde at Canberra ..." needs to be replaced with the following:

The IPS ionosonde at Canberra is relatively close to the likely ionospheric reflection points at the western end of the paths. As Es clouds drift in a westerly to north westerly directions at speeds ranging from about 70 metres/sec to 120 m/s in this region, the ionograms relating to the reflection points grouped over Victoria are earlier than the times of the contacts. The geographic spread of contacts indicated an extensive Es cloud (or cloud cluster). Such an extensive Es cloud drifting generally west at 75 m/s will pass the meridian of the Canberra 'sonde and take about another 90 minutes to pass the meridian through the westerly reflection point on the VK5BC-

ZL2OK path. The contact occurred at about 0107 UT. The ionogram for 2338 UT (2 Jan), 89 minutes earlier, shows intense, spread Es traces, the base height at 94 km, and a top frequency (ftEs) of 15 MHz. The ionospheric 'split' at Canberra is 0.8 MHz, so the penetration frequency, foEs, is 14.2 MHz. As the contact was confirmed, it can be safely assumed that similar or sufficient conditions prevailed further east along the path, over the Tasman Sea.

The first two sentences of the paragraph that followed need to be replaced with this:

The Es layer at the time was 'crinkled' or 'rippled', providing the conditions for petit chordal hop, which dramatically raises the MUF [1,2]. With foEs at 14.2 MHz, the electron density of the rippled Es layer was sufficient to support propagation with an MUF of about 162.8 MHz for the western hop on this occasion.

Attendees at GippsTech this year may question the blushing author.

Please send any Weak Signal reports to David VK3HZ

Digital DX Modes

Rex Moncur – VK7MO

FSK441

Welcome to Kirk VK2MER who is operational on FSK441 during the activity sessions.

PSK2k

PSK2k is a new mode for meteor scatter that has been developed by Klaus DJ5HG. Klaus has an article in DUBUS 1/2012 that explains the mode and how it works and gives references to URLs where it can be downloaded: http://www.DJ5HG.de/PSK2k. Klaus puts forward advantages compared to FSK441 as higher speed, better sensitivity and forward error correction. To date few in VK has been able to get it to work effectively on meteor scatter although Arie VK3AMZ and Kevin VK4UH have noted that when it does decode, the error correction is very effective and produces fully accurate decodes. In updates as reported below, the first VK PSK2k QSOs have now been completed. Kevin describes his use of the mode as follows:

Once running it is VERY different to FSK441. First impression is that PSK2K needs "more" to give a decode - either louder or longer than FSK441.

The other major difference is that you don't get the audible "Bzzzztt" of a ping from the speaker. The sound you hear is little more than a "hiss" and is very subtle and easy to miss.

I have found also that even my laptop can run PS2K and WSJT in parallel, both decoding from the same Signalink interface so I can watch for either type of signal on the same frequency in separate windows. This may be useful in the future.

I have completed my first QSO on PSK2K over the weekend with VK4MIL although on tropo/AE not MS but at least I could see how the automated system works.

In an update Kevin reports:

After a number of successful QSOs with Colin VK4MIL using PSK2K via tropo, to get the feel of the program, a successful contact was made with Arie VK3AMZ in QF22FE via meteor scatter 31 March 2012 at 18:56 utc - a path done many times before on FSK441. Several strong pings were heard although the usual characteristic bzzzzt sounds were absent. The program certainly works and the auto advance of

the reports is interesting (This is a feature that automatically advances the reports from R to RRR and then 73 as the QSO progresses). Is this the future of MS activity in VK - time will tell!

PSK2k requires one to first load MatLab as set out on DJ5HG's web site and many stations have found it is very difficult to get operational. The problem seems to be that one must ensure that all relevant programs are in the same folder.

Arie VK3AMZ has commented:

Yes a very frustrating and clunky program to get going. I'm spurred on by the fact that it is new and may be superior to FSK441 (I doubt it) but I won't know unless I've reviewed it.

I've now upgraded to version 5.4 (from 5.1) maybe that is my issue? I can't (but I think I can?) understand why I decoded Kevin first time I fired it up for a session and then nothing since. I believe I was decoding in receive mode.... which is an open gate as such. As soon as I selected his callsign for replying, that's when it went pear shape?

Congrats on at least confirming that it's possible for two stations to talk to one another but I don't think it has much of a future (I could be wrong?), simply because you can't run multiple QSO's simultaneously.

Unless it is an order of magnitude better than FSK441, I'd give it a thumbs down.

Update: on the 30th March 2012, I completed PSK2K QSOs with VK4UH and VK2XN. Reports sent to both stations and reciprocated were 0 dB. I found there is no ambiguity with regard to decoding PSK2K signals as can be the case with FSK441. I see this as this mode's prime advantage. I do miss the partial or corrupted decode presentation that is typical of FSK441, this at least gives an indication of the flow of a QSO. PSK2K is far more "digital" in that respect, it's either there or not at all. My only other observation is that it doesn't afford multiple QSO's at the same time. This is a disadvantage when the bulk of VK meteor scatter activity is for an hour or so on a Saturday and Sunday morning. I think the social flavour of these activity sessions would suffer if we confined our QSO's to 'one at a time'.

As a final note, PSK2K is incredibly CPU intensive, my old P4, 2.4 GHz processor struggles when 8K input sampling rate is selected, and at 16K the program begins to misbehave. So all those old PC's that worked without issues running FSK441 will struggle with PSK2K (a sign of the times!).

It is probably early days for PSK2k but as can be seen from the above comments it does not seem work nearly as well as FSK441. If others have more success, please send reports.

New 24 GHz Digital Record

On 13 March 2012, David VK3HZ at Mt Liptrap in Victoria worked Rex VK7MO, assisted by Joe VK7JG, near Georgetown in Tasmania using JT65c via Aircraft Scatter over a 255 km non-line-of-sight path on 24 GHz. The idea behind this work was that by using aircraft scatter the majority of the path is at high altitude where the levels of water vapour are lower and thus absorption is decreased. The absorption loss was calculated for this path at the surface at 65 dB compared to 9 dB for the aircraft scatter path. There was no evidence of direct signals but weak aircraft scatter was present on most aircraft crossings with a best signal of -21 dB. A full report of this work as at:

http://www.vk3hz.net/microwave/Aircraft_Scatter_Contact_24_GHz.pdf

Please send any Digital DX Modes reports to Rex VK7MO

The Magic Band – 6 m DX

Brian Cleland – VK5BC

March was highlighted by great contacts by BobZL1RS and Brian VK4DDC long path into EA8 Canary Islands. On the morning of the 11th March Bob ZL1RS worked EA8CK on CW over a distance of over 18,800 km. Then on the 18th March Bob reported hearing the XE1RCS beacon and working EA8CK and EA8AK both CW 559. This time however though Brian VK4DDC in the Gold Coast are also worked EA8AK long path on CW 559 over a distance of approx 21,000 km. Well done Bob & Brian.

Phil TI7/N5BEK in Costa Rica was also worked on several occasions during March:

8th by Wade VK4WM in Hervey Bay CW,
12th by Brian VK4DDC CW,
16th by Scott VK4CZ in Brisbane CW & SSB and
19th by Frank VK7DX in northern VK7 CW.

JA's were worked on most afternoons in March from all areas of VK4. Wayne VK4WDM in Townsville reported the band has been open to JA, BA, BV and HL most days starting about 03:00Z and continuing well into the night. Most openings were characterised by unstable signals and marked QSB. Weak American and probably Mexican or Central American voices were heard around 23:30z on the 5th but no QSO's resulted. The biggest JA opening occurred from mid-afternoon on the 31st with most areas represented with very strong signals and KH7Y was heard on CW. The northern openings extending south down the east coast on some days and John VK7XX reporting that on March 11th, between 0345 and 0422 UTC working 44 Japan stations in all call areas except JA4 and South Korean stations DS2KGJ and 6K2FBA with a huge pileup on 50.140.

Most days the northern TEP openings missed VK5, the exception being the 19th & 31st when JA's were worked in the afternoon TEP. Willem DU7/PA0HIP was also worked from VK5 the evening of the 13th. Most days though the northern openings did move from VK4 to VK6 with JA's being worked on many afternoons as far south as Perth.

Some good 'E' opening occurred during the month and they were interesting as very short skip was experienced. Colin VK5DK reports on very rare short skip opening from Mt Gambier to Melbourne:

Since the beginning of March, there have been a few openings on 50 MHz to the southeast of South Australia with a brief opening to VK4 with a contact to Errol VK4KR on the 5th of March with marginal SSB signals sent & received 5 x 3 both ways.

There were no openings observed at this QTH until Sunday the 11th of March when at 0120 UTC VK3AKC was contacted with S9 SSB signals both ways. Working VK3 stations from Mt Gambier on Sporadic E is very rare & particularly with such strong signals. Over the next two and a half hours I was able to work a total twelve stations in order of contact were VK3AKC, VK2BX, VK3AKK, VK3HY, VK1DJA, VK3MY, VK3AUQ/P, VK3DUT, VK2BHO, VK3ADR, VK5PO & finish with VK6NS, also heard but no contact was with VK5BC/P. Later that evening at 10.30 UTC I had my first contacts into China with contacts with BG6CJR followed by BA4SI at 11.23 UTC with two contacts into Japan with JA3KVT at 11.28 UTC and JA6UOU at 1140 UTC, Gary VK5JR also worked BG6CJR, JA3KVT & JA6UOU during the opening to the North.

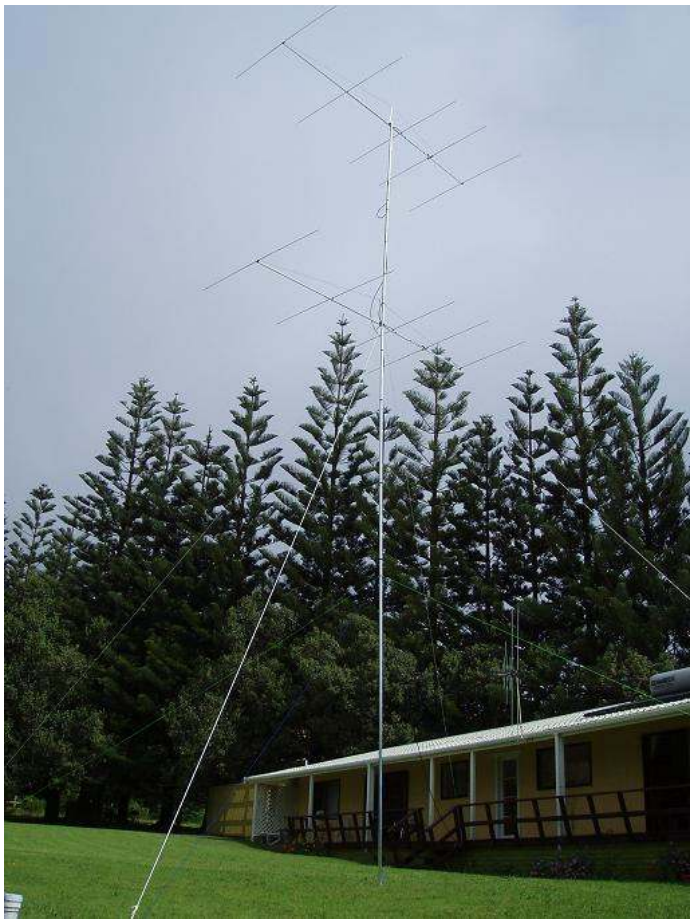
A report from Garry VK5ZK stated that when I was working the Chinese & Japanese stations there was no sign of their signals in Goolwa, although Garry was able to hear my signal.

Since then there has not been any contacts on Sporadic E or F2 contacts from this QTH although I have been keeping a close watch on the band & the VK Logger.

This was a good test for my newly constructed 50MHz P.A. unit which has passed the operating test with good results and reports to date are very favourable regarding audio quality.

The opening experienced by Colin on the 11th extended from VK6 to ZL over a few hours with contacts being completed between VK6, VK5, VK3 & ZL. Again on the morning of the 18th another good short skip opening from VK3 to VK5.

Bob ZL1RS has been operating portable from Norfolk Island using the callsign VK9N/ZL1RS since 28th March and will operational there until the 8th April. Bob's portable antenna setup comprises 5 over 5 yagis on a 13.5m portable mast. See pictures below:



Once setup, Bob had immediate success on the 28/29th March with over 70 stations worked in VE7 and the NW USA. Nothing further south except one or two W6 stations and W5UN. TI7/N5BEK also heard.

The KH6 beacons were S9 at around 07:30 UTC on the 29th and Fred KH7Y was very loud and Bob worked a few JA's and one DU.

A few stations from NA have looked for Bob's JT65A CQ's on 50.190 at moon rise and N6KK and K7CW have managed "direct" digital QSOs when 6 m appeared "closed". Bob reports that obviously the band has been marginally open and the sensitivity of JT65A making the difference. Bob has also been completing many EME contacts.

Please send any 6 m information to Brian VK5BC