

---

# VHF/UHF – An Expanding World

---

David Smith VK3HZ  
Leigh Rainbird VK2KRR

## Weak Signal

David Smith - VK3HZ

The continuation of good weather conditions in the south of the country has resulted in a few slow moving high-pressure systems moving across, producing some good propagation. In particular, on the evening of April 19<sup>th</sup>, a High settled over central Victoria producing good conditions in every which direction. Of note, Rob VK1ZQR reports working VK7JJ near Launceston. Bob VK2TG in Sydney reports hearing VK7JC, but no contact was made. The following morning, John VK5PO in the Barossa Valley reports working Joe VK7JG.

On several other occasions during April, conditions to the east from Adelaide have been excellent producing many QSO's between the stations present.

## EME

Further to last month's report, Alan VK3XPD has successfully completed the first Australia-Italy QSO on 10 GHz EME. On May 4<sup>th</sup>, Alan worked IQ4DF – the Bagnara di Romagna 10GHz EME Group station – with operator Vico I4ZAU. IQ4DF runs 200 watts to a 7 m dish.

I was fortunate enough to be in the shack while Alan was having this contact. Alan uses a camera mounted on the dish to point at the moon, but unfortunately the day was somewhat cloudy. Fortunately, he had "found" the moon during a clear spell and was able to keep track of it by peaking on the moon noise. We were hearing echoes quite well, even in an SSB bandwidth, with the S meter even kicking upwards at times. I was somewhat surprised by how clear the signal was given what I've read about smearing of microwave EME echoes due to libration. Alan's station is GPS-locked and so he was quite confident that he was on the correct frequency – allowing for a Doppler shift of around 27 kHz. Sked time passed and nothing had been heard in reply to Alan's CQ's. Finally, he tuned around and found IQ4DF calling up 10kHz with a big signal – the S meter was definitely off the stop. Alan completed the QSO looking like the proverbial one-armed dishwasher, operating the manual PTT and key while having to tweak the dish position during the over and then correcting for changes in Doppler shift. After the CW QSO was over, IQ4DF then called on SSB and was given a 54 report. Alan received 51. All in all, a very impressive showing and it's good to see that Alan's hard work is now paying off.

## Weak Signal Operating Hints

Some months ago, there was a discussion on the VK-VHF reflector about operating techniques for VHF/UHF weak signal operation. I thought it would be good to pass these tips on and I thank Gordon VK2ZAB, Chris VK2DO and Chas VK3PY for these words of wisdom.

Apart from the obvious technical requirements of a good location, high power, low noise figure and big antenna, there are operational factors that play a big part in the success or otherwise of making contacts with weak SSB stations on the VHF/UHF bands. Many stations run the legal limit, so even though you can hear them OK on

your barefoot rig (generally 50 watts), they may be receiving you at a level up to 10 dB less. Some operating hints, in no particular order:

[1] If the situation arises where you are called by two DX stations, always work the weakest one first. If conditions deteriorate, you may lose the weak station, but still be able to work the stronger one.

[2] Repeat YOUR callsign. The other station is familiar with their own callsign, and is much more interested in knowing what your callsign is. So use "VK3ABC, this is VK3XYZ, VK3XYZ, VK3XYZ over".

[3] Do not place too much faith in phonetics. Some letters need them (e.g. "H") and some probably do not (e.g. "Z"). Repeat your callsign both as letters and phonetically. Unless you're working a ZL station or similar, don't use phonetics for the "VK" part. And try to stick to phonetics that the other station will be familiar with – preferably the standard set. Making up your own phonetics will have the other station doubly confused as they try to guess what you're saying.

[4] Call for a reasonable time, to allow the other station to peak their antenna on you. Try to get your (well-known) location or gridsquare across so that the other station can determine your heading. You may be off the back of their beam, so be patient as their rotator grinds around.

[5] Whistle "K" at the end of your overs. As CW operators well know, CW will get through where SSB will not. For a very weak station, the whistled "K" will often be the only thing heard, but it does indicate you are there and have finished your over.

[6] For a valid QSO, you need to exchange callsigns, signal reports and acknowledgements. Therefore, don't slacken off after the callsigns have gotten through. You're only a third of the way there!

[7] Finally, more to do with operating etiquette, if a local station has just ended a CQ call, wait a reasonable time for any possible reply before calling CQ yourself. While you may not hear a station responding to the CQ, it doesn't mean there isn't one.

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

## **The Magic Band – 6 m DX**

Brian Cleland – VK5UBC

The summer DX season is now well and truly over, particularly for the southern states. Other than the odd interstate contact and the occasional beacon breaking through the band has been very quiet. Since early March there have been very few openings except between VK4 and northern VK6 to Japan. The 6m Logger indicates that Japanese stations are hearing various Northern Australian beacons on most days with a few contacts between occurring between VK4' and JA's.

The only recent DX heard in VK5 was on 2nd May when the Toowoomba Chan 0 TV was S9+ and I worked Alan VK4ID. This is the only VK5 opening I'm aware of since 29th March.

Joe VK7JG reports that 6 m opened between 0328 and 0411 UTC on 25th April 2005 for the first time since 24 Feb. Stations worked included VK4WS, VK4AFL, VK2HO, and VK4CDI. At one stage the TV interference from CH0 Toowoomba was S9 across the whole band. Alan VK7AN was also active from his shack just south of Eddystone Point on the East coast of Tasmania where he also worked most of the above stations as well as a VK6 and from Hobart Ian VK7ZIF was among the DX.

A bit different if you live in far north Queensland as can be seen from the note I received from John VK4FNQ. John summarized his log from the 1st January and reports;

I've made 779 entries into the heard database which also covers TV indicators outside VK.

Worked 196 stations on six on SSB since 01 January 2005 comprising:

VK1 – 2, VK2 – 24, VK3 – 8, VK4 – 23, VK5 - 11 (8 with VK5UBC), VK6, 7 & 8 – 0.

On the international scene John reports a total of 118 JA contacts have been made, 4 Korean contacts as follows, 10 March 6K2DHP, 12 March HL2FDA, 13 March HL2JFM and 13 April HL4GHT, 3 Chinese contacts as follows, 13 Mar BD9BA, 14 April BD4XA and BD9SI. Also 3 ZL contacts.

John also reports hearing the following,

FK8SIX/B 40 entries from 08/01/05 to 16/03/05 last heard  
VK8RAS 16 entries from 11/01/05 to 16/02/05 last heard  
VK8MS Mark only heard once 19/02/05  
KH6SX on 09 Mar 2005.

From Perth John VK6JJ had a good day on the 13th April with a good opening to Japan. John reports signal were up to S9 and that he worked 7 JA's, 4 on CW and 3 on SSB.

Information from the 6m propagation logger indicates that on the 5th May JA's worked into northern VK4 & 6 and Gary VK4ABW worked KH6SX.

A good opening occurred between VK6 & 5 on the afternoon of 6th May. Both the VK6RPH (Perth) and VK6RBU (Bunbury) beacons were strong in Adelaide with VK5UBC working Peter VK6KXW and John VK6JJ (5/9+).

Please keep those 6m rigs running during June as often good sporadic E interstate openings occur in this period.

Please remember to send any 6 m DX information to Brian VK5UBC at ... I can only report what I know.

## Digital DX Modes

Rex Moncur – VK7MO

Recently a few stations have reported problems in decoding FSK441 with WSJT. In most cases these have been caused by inadequate audio frequency response to cover the audio tones used by FSK441. The problems can often be traced to things like the use of too narrow an IF filter, the use of IF shift or the use of DSP notches or noise reducing systems. While such features can be valuable for SSB, it is best to let WSJT do all the filtering and keep the passband as wide as possible when using this program. This is something to remember in changing from SSB to WSJT. It is also possible that poorly matched interface units could limit the audio response.

WSJT includes a facility that tries to automatically compensate for variations in the audio response but it has limits and to my mind one should aim to keep the audio passband as flat as possible within the range of frequencies used by FSK441. While FSK441 uses tones of 882, 1323, 1764 and 2205 Hz one must in addition allow for sidebands as these tones are switched at 441 times per second. In addition one must allow for stations to vary in frequency and for Doppler shift due to the movement of meteor trails in the winds of the upper atmosphere. Taking all these factors I think one should look for a reasonably flat passband from around 500 to

2600 Hz. It is difficult to say what reasonably flat is but certainly 20 dB causes significant decoding problems and I would aim for less than 6 dB variation over the range 500 to 2600 Hz.

It is possible to use the program SPECTRAN that is packaged with WSJT to make a simple but accurate plot of the audio passband. First feed your receiver from a 50 ohm load to produce a white noise source and make sure there are no birdies. The procedure with SPECTRAN is as follows:

Under the "show controls" dialog box set SPECTRAN as follows:

Freq. Offset = 0  
Resolution = 5.4  
Avg Factor = 128  
Sampling Rate = 11025  
Tick Block Average

On the normal SPECTRAN Screen set:

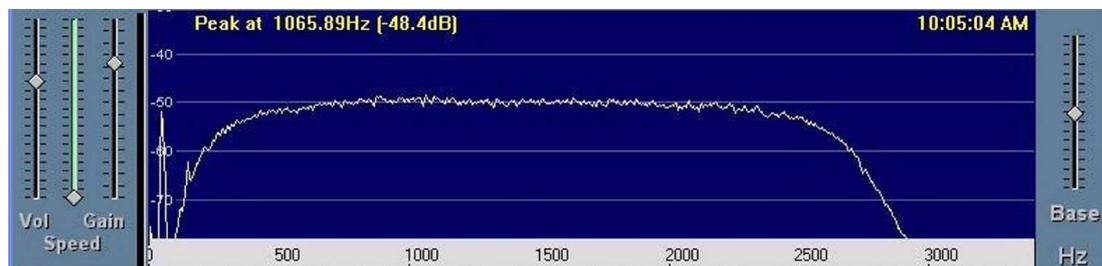
Gain: to 5 marks from the top

Base: to around midscale or so you see the audio spectrum centred in the upper window.

Press the Average button so it highlights in Red

Start SPECTRAN and it will build up an average spectrum in about 30 seconds.

The following diagram shows an example average audio spectrum for the IC-910-H with its standard filter. It has dropped off by about 3 dB at 500 Hz and about 6 dB at 2600 Hz. You will also notice AC line spikes at 50 Hz and 150 Hz but these are sufficiently low in frequency so as not to be a problem.



Please send any Digital DX Modes reports to Rex VK7MO at ...

## 2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

During April, the Canberra 146.950 repeater was the focus of some amazing DX activity from areas of VK2, 3, 5 and VK7. Remaining quiet in most other areas.

In the morning of 12/04, the first part of our Canberra repeater DX frenzy kicked off. The signal quality ranged from noisy to noise free with a slow QSB. Two of the first stations to realise the path to the Canberra repeater was there were George VK3HV in Morwell at 430 km, followed by Phil VK1PC who was actually mobile west of Hay, about 450 to 500 km out. Later in the morning, stations that I heard call in were Bruce 2AYM near Albury, 200 km; Ed VK3BG near Cobram, 290 km; Grant VK2AXB near

Orange, 250 km; Ian VK3ZZG and Richard VK3JFK both mobile at Bendigo, 470 km; Ralph VK3WRE at Traralgon, 430 km and Bob VK3AQK, unknown location.

The Canberra repeater DX frenzy part 2 began in the evening of 20/04. Only a week before this I had been commenting that it had been at least 4 years since I had heard any DX from VK7 into the Canberra repeater, and what do you know, in it comes!

At 10.20 PM a call into the repeater by Peter VK7LCW started it all! Peter is located at Penguin on the Tasmanian north coast, 663 km from Mt Ginini 146.950. The rare DX call was quickly snapped up by Paul VK2ZPB not far from Canberra and Wayne VK2PDW in Wagga, also in came George VK3HV at Morwell.

At 11 PM, Phil VK7JJ then called into VK1RGI Canberra. Phil is at Weymouth, 625 km from the repeater and was punching a very good signal in and commented the repeater was 5/9+20 at his QTH. Shortly after midnight another amazing signal found its way into VK1RGI, that of John VK5PO at Eden Valley, an amazing 884 km from the repeater. John was able to speak with Rob VK1ZQR and also Phil VK7JJ. Rob VK1ZQR was able to work VK7JJ on SSB but could also hear Phil on FM.

The following morning 21/04, more amazing signals were heard into VK1RGI. John VK5PO was again getting to the repeater, albeit noisily at 11.30 AM. At 3 PM, Steve VK2UD was in on a 400 km path from Newcastle.

Later at 6.45 PM things were still happening when John VK5NJ in Mount Gambier got into VK1RGI over 756 km, and only running a 5/8 wave omni. At 7.15 PM, Ken VK3HKR just east of Melbourne made it in, as did George VK3HV. At 9.30 PM, VK5NJ was back, also Steve VK3TSR at Yarra Junction, 376 km.

After 10.30 PM, more excitement when into VK1RGI came Peter VK2ZTV, Steve VK2UD and Peter VK2YPW all from Newcastle, they spoke to VK5NJ in Mount Gambier and also Craig VK3MCW in Colac, 556 km. Following this were Brian VK3BBB at Traralgon and Mark VK3HMB at Wangaratta.

A final short burst of life was shown from the duct in the early evening 22/04. I was surprised to hear a call into the Canberra repeater from Ian VK3IDL at Ballarat, 493 km. Then from Les VK3TEX at Kyabram, 346 km.

I have analysed the apparent cause of these conditions and found a high level duct around the Canberra repeater height, 1700 MASL, over Canberra, this dropped to lower levels around VK3, 5 & 7, but was still an unusually high duct (1000 m +) to still be workable from these areas.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at ...