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# VHF/UHF – An Expanding World

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David Smith VK3HZ

## Weak Signal

David Smith - VK3HZ

Conditions are picking up and it's looking good for the coming season.

On 20 September, the Hepburn site indicated that there might be good conditions from northern Queensland to New Caledonia (FK8). At about 0600Z, Kevin VK4ABP and Andru VK4KAY in McKay reported hearing FK8 FM broadcast stations, and the FK8ZHA repeater up to S3. However, they were barely able to trigger the repeater and unable to raise anyone. Signals faded out by about 0900Z.

The afternoon of 6 October saw the first VK to ZL contacts for the season. At 0430Z, David ZL1BT reported hearing the Channel 5A TV from Newcastle. At 0445Z, he worked Ross VK2DVZ on 2 m with signals up to S4. At 0530, ZL1BT worked VK2AMS (in VK2DVZ's shack) with signals now up to S9. Ron VK4KDD had gone out to his portable location at Clear Mountain near Brisbane. At 0730Z, he worked ZL1BT giving a 4x1 report and receiving 4x4. Meanwhile, Nick ZL1IU had appeared. At 0735Z, he worked VK2DVZ (5x7) and Steve VK2ZT (5x9). By 0753Z, ZL1IU's signal had risen to S9+40 at VK2ZT's location, while ZL1IU was working VK4KDD (and presumably beaming further north). At 0807Z, Wayne VK4WS worked ZL1IU and ZL1BT. VK4WS and ZL1BT then switched to JT65b digital and had an easy contact at around -18. By 0930Z, the ZL stations had all retired to bed. The following morning (7 October), VK4KDD was again out at Clear Mountain and at 2210Z, he again worked ZL1BT at up to S2.

The VK to ZL opening had some interesting propagation conditions. The weather chart showed a high-pressure cell off New Zealand with isobars forming an almost straight corridor between the north of New Zealand and the mid east coast of Australia. This provided the tropo enhancement. There was also a cold front coming through the Sydney area at the time, and all of the action was to the north of Newcastle. Steve VK2ZT was getting very strong signals from Nick ZL1IU, even though Nick was beaming towards VK4. It seems that the signals were propagating along the front, enhancing conditions considerably.

## VK1 Portable Operations

On the morning of Sunday 23 September, Ted VK1BL and Andrew VK1DA were operational from Mt Ginini ACT. The object was to test Ted's recently completed equipment for 23 cm and 13 cm in preparation for the upcoming Spring VHF Field Day (17/18 November) with the additional hope of making contacts into the Melbourne / Geelong area. They were running approx 30 watts on each band using a 3 m long loop yagi for 23 cm and a gridpack dish for 13 cm. For liaison, they had 100 W on 2 m and 40 W on 70 cm into reasonable-sized antennas.

Charlie VK3NX was also out portable near Geelong with the hope of working back to Mt Ginini. However, nothing was heard of Charlie's signals, although Charlie reported hearing brief bursts.

Ted and Andrew did make some contacts on 2 m and 70 cm into Sydney and Melbourne. They also worked a station in Bathurst on 23 cm and some local stations.

Rob VK1ZQR tried valiantly to extract their 2.4 GHz signal out of the S9 WiFi hash in his area without success. Their location was to the south west of a wire fence

surrounding the Airservices compound which would have significantly reduced the signal towards Canberra.

They plan to do additional testing, so look for them during the November Field day.

## **EME**

Ian VK3AXH reports an interesting 2 m EME contact:

*On September 26, I woke up at around 4:30 am and not being able to settle decided to see where the moon was. I set things going to find the moon about 10 degrees off moonset. After looking at the EME Logger, I saw a station calling CQ on 144.118 MHz. However, approximately 1 kHz higher I could also see quite a strong looking signal so I returned to 144.119 MHz to see who it was. RA6AX was just finishing a QSO with DL2NUD and as he registered -3db (big signal) I got all excited as it was the strongest signal I've ever seen off the moon.*

*At the end of his over I called him on CW for a minute and waited for any response. To my surprise he called me on SSB and we were able to easily exchange reports. At times he was up to 5/5 on my meter and I received 4/1. After a couple of overs and signing off with our 73's we changed to JT65B for final 73 etc.*

Ian suspects that RA6AX may be a club station using the station of RN6BN as they both use the same gridsquare (KN95). Ian has previously worked RN6BN at levels up to -6. RN6BN runs a monster station with 64 x 15 element H and V yagis and a substantial amount of power.

Ian's setup consists of an IC-910H driving an AM17 amplifier feeding a 4x18 element array.

## **New Net**

Ron VK4KDD reports that there is a new SSB activity net on 144.200 on Tuesday evenings from 1900 to 2100 EST. The idea is to create some weak signal activity in the evening, mirroring the activity that takes place in the mornings. Of course, aircraft continue to fly throughout the day, so Aircraft Enhancement can be used equally of an evening.

On a recent net, Glenn VK4BG in Hervey Bay worked Steve VK2ZT near Newcastle – a distance of over 800 km. Ron achieved a maximum distance of 640 km, working VK2IF, VK2ZT, VK2FPRG, VK4KK, VK4BG, VK4JMC and VK4HMR.

The only problem with operating in the evenings is that of TVI. If you have this issue, Ron has some suggestions for resolving it.

Log on to the VK/ZL Logger ([www.vklogger.com](http://www.vklogger.com)) to see what is happening.

## **ATV DXpedition**

Jack VK2TRF reports that he and Dan VK2GG had more fun than The Chasers on the APEC weekend, operating an ATV Microwave DXpedition.

Jack, with Gary VK2UNI and Rob VK2RMP as helpers, was in the Brindabellas near Canberra on Mt Ginini and Mt Coree and then to a large hill near Boorowa for the 24 GHz shot. Dan, with Dave VK2TDN assisting, was near Mt Towac, just in the shadow of Mt Canobolas near Orange.

A quick summary of the contacts achieved is as follows.

Friday 7/9	1285 MHz	Mt Coree to Orange (216 km)	P4
Friday 7/9	2415 MHz	Mt Ginini to Orange (241 km)	P3
Friday 7/9	3580 MHz	Mt Coree to Orange (216 km)	P4
Friday 7/9	5750 MHz	Mt Coree to Orange (216 km)	P4-5
Friday 7/9	10236 MHz	Mt Coree to Orange (216 km)	P3-4
Sunday 9/9	24150 MHz	Boorowa to Orange (120 km)	P3-4

Congratulations to all involved.

## New Optical Record

Further to last month, Clint KA7OEI and associates have extended the optical communications record to a staggering 278 km between two high (2900 m) mountain peaks in Utah. It took them several hours to align their transceivers, using an 8-inch telescope to spot the extremely weak red dot. The signal was not visible to the naked eye, and the voice was extremely weak.

Unfortunately, we do not have any line-of-sight locations in VK that are anywhere near that distance. 200 km is about as far as it goes here. So what that means is that the record is unlikely to ever return to VK, unless someone wants to go balloon mobile that is!

Please send any Weak Signal reports to David VK3HZ

## Digital DX Modes

Rex Moncur – VK7MO

Steve VK2ZT, near Newcastle recently ran some tests with a CW beacon on 2 metres, and Jim VK3II, at Westernport, was able to use the waterfall program Spectran to establish there is a viable 856 km path. Following these tests, Jim suggested they try the Digital Mode JT65A and this produced good results with median signal levels varying from -15 to -20 dB. As a result, a number of stations have joined in and most weekday evenings there is now an active group of JT65A operators mostly on 2 metres checking out propagation in the South East of Australia. Many of these operators are new to the Digital modes. Stations involved include: Dave VK1DJA, Colin, VK2KOL, Steve VK2ZT, Jerry VK2APG, Matt VK2DAG, Mark VK2EMA, Bill VK2ZZF, Dave VK3HZ, Peter VK3SO, John VK3JT, Jim VK3II, Andrew VK3KAQ, Jim VK3ZYC, Phil VK4CDI, John VK4JMC, Ron VK4KDD, and Peter VK5ZLX.

The use of JT65A gives about 1.2 dB better performance than JT65B providing both stations are stable to within a few Hz over a transmission. Most operations are on 144.225 MHz with southerly stations transmitting first period. As the bandwidth of JT65A is just under 200 Hz, it is possible for a number of stations to use the same SSB passband by moving up or down a few hundred Hz. By use of the tolerance and freeze facility on WSJT, one can then decode all other stations working on the frequency. Activity is normally coordinated on the VK-ZL logger: [www.vklogger.com](http://www.vklogger.com)

One advantage in using JT65 in the evenings is that it is a constant amplitude mode and thus much less susceptible to causing TVI.

It is interesting to speculate on the type of propagation. Weak tropo-scatter is continuously available up to 800 km between single-yagi stations running 100 watts and at the longer distances gives signal levels around -28 dB. Some of the stronger signals are probably aircraft enhancement, with some being only short period strong

enhancement as experienced on SSB due to forward scattering, but there are also longer periods of weaker aircraft enhancement due to side scattering.

There is an advantage in using the latest version of WSJT, Version 5.9.7. With this latest version one can right click on the callsign of any station you decode and WSJT will automatically set up the correct QSO procedure for terrestrial reporting, including the two character dB signal reports.

Peter VK3SO, and Bill VK3JT both have their rigs GPS locked and have at times noted frequency differences of up to 6 Hz which suggests that they are in fact using aircraft enhancement and picking up the Doppler Shift.

It has been found that a number of the stations new to WSJT have had problems in decoding and the following is a useful checklist when one finds one can see a signal on the WSJT waterfall display which does not decode.

- Computer timing should be correct to within 2 seconds. The timing window of JT56 is not symmetrical as it is primarily designed around EME where there is around a 2.7 second delay. Thus, just because a station is copying you, it does not mean the timing is close enough for you to copy them.
- The mode must be the same as that of the transmitting station – normally JT65A for terrestrial contacts.
- Check the DF or difference frequency shown when WSJT attempts a decode and, if this is not the same as the frequency you see on the waterfall, use the tolerance and freeze facility to ensure decoding is restricted to the signal of interest. Tolerances as low as 10 Hz can be useful in separating a signal from a nearby birdie.
- Set the program to “Aggressive Deep Search” to provide maximum sensitivity.
- Set the “Sync” value to 0 to improve the prospects of gaining sync.
- WSJT uses two decoders: (1) called a Kotter-Vardy decoder that will decode any callsign or random text (max of 13 characters) down to about -24 dB and (2) called the Deep Search decoder that will typically decode down to -28 dB but occasionally as low as -30 dB. The Deep Search decoder can only be used where the other station’s callsign and grid square is included in the program’s data base.
- Note that if the transmitting station has not correctly formatted a message then it will not decode with the Deep Search Decoder. The best way of ensuring that messages are correctly formatted is to use the latest version of WSJT and you can then right click on the other station’s callsign and the formatting will all be set up correctly. If the signal is stronger than about -24 dB it may still decode with the Kotter-Vardy Decoder but an incorrectly formatted message will be treated as text and only the first 13 characters of the message are received. If you are in fact attempting to send a text message rather than two callsigns and reports, this must be limited to 13 characters.
- Meteor pings can often affect decoding. If you can see the meteor ping on the waterfall display it is often possible to set the tolerance to reject the ping.
- Use the AFC (Automatic Frequency Control) facility to compensate for frequency drift.

Steve VK2ZT and Mark VK2EMA have recently taken to EME using JT65b. Their grid square locations have brought about a fair amount of interest. Recently Steve worked over 10 stations in an hour.

Please send any Digital DX Modes reports to Rex VK7MO

# The Magic Band – 6 m DX

Brian Cleland – VK5BC

September was a very quiet month on 6 m with very few reports of any openings, the exception being the 24th September when E openings were experienced across most of Australia. The equinox came and passed with only the Chinese TV on 49.750 MHz being heard on a few occasions, mainly in Northern Queensland. I guess being the bottom of the sunspot cycle this is to be expected, unfortunately with nothing unexpected occurring.

Early October though the band has shown some good sporadic-E activity particularly down the eastern seaboard as well as some good openings between VK5 and VK1, 2 and 4. Particularly good openings occurred on 7th, 8th and 9th October with several contacts being made from VK4 to VK1, 2, 3 and 5, VK5 to VK1, 2 and 4 and VK7 to VK2. The VK6 beacon was also audible in VK2 and VK5 on the 9th October.

Much discussion (some very emotional) takes place between 6 m operators over the use of call channels. The band plan lists 50.110 MHz as the international call frequency and 50.200 MHz as the Australian call frequency. In operation though nearly all operators only call on 50.110 MHz. I monitor both call frequencies and have not heard one single CQ on 50.200 MHz in the last 5 years and for interest have made some CQ calls on 50.200 MHz without ever receiving a reply. From my point of view you have to query the value of 2 call frequencies and I notice the same thing occurring on 10 m where operators only call on 28.490 MHz and rarely on the local nominated call frequency of 28.390 MHz. After all, you are entitled to call on the international call frequency hoping that you may receive an international reply. The important thing though is once contact is established you move off the call frequency as soon as possible whether you receive an international or local reply. Alternatively if you call on the international call frequency (50.110 MHz) and the band is open locally and you expect a local reply nominate a frequency that you are going to listen for replies to your CQ (e.g. CQ CQ 6 m listening 50.155 MHz). At the end of the day common sense should prevail and you should be courteous to other operators wishing to make calls. I think we have all been caught where we think we are only going to exchange a report but the conversation develops and we haven't moved off the call frequency immediately and I'm sure most would have been caught in the excitement of a rarer contact. If a contact is taking place on the call channel (particularly local) advise them politely that you wish to make a call and ask them to shift frequency.

I would be interested in your views in regard to the use of the call channels and the value of the local call frequency. As 6 m operators we need to sort the issue out and establish good operating practice among all operators prior to the next sunspot cycle peak when international DX will again be available and seen as a priority.

Please send any 6 m information to Brian VK5BC