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# VHF/UHF – An Expanding World

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David Smith VK3HZ

## Weak Signal

David Smith - VK3HZ

On the afternoon of March 25<sup>th</sup>, there was another Tropo opening from the east coast across to NZ – probably the last for the season. At 0140Z, Bob ZL3TY reported hearing the Newcastle Channel 5A TV audio at S7. Eventually at 0715Z, with Channel 5A still coming through, he managed an SSB contact with Steve VK2ZT on 2m with 5x5/5x6 reports. At 0733Z, Colin VK2BCC also worked Bob on CW with 5x1/5x3 reports. Several others were heard, but no contacts made.

Then on the evening of March 27<sup>th</sup>, the bands opened up across the Bight from VK3 to VK6. At 1230Z, Mike VK3KH and Ross VK3MY reported hearing the Albany 2m and 70 cm beacons and the Esperance 70 cm beacon, all at around S2. An hour later, the Albany 70 cm beacon had risen to S9 at Ross' QTH. However, it was a case of "no-one's home" and unfortunately no contacts were made.

There has recently been a surge of interest in the 23 cm band, and there are now a number of stations with high power, good antenna systems and sensitive receivers. The current National record on 23 cm was set 21 years ago between Les VK3ZBJ (SK) in Frankston and Wally VK6WG in Albany – a distance of 2455 km. I think it's highly likely that this record will be broken in the next year or two but, of course, it requires everything to come together – conditions and people on-air at each end!

## 70 cm Band

The ACMA have been undertaking a review of what they refer to as the 400 MHz band (403 - 520 MHz). The review specifically excluded any consideration of changes to the 430 - 440 MHz area, but it did include a review of the remainder of our 70 cm band. A recent update from the ACMA has now also excluded any changes to the 440 - 450 MHz area, much to the relief of the ATV enthusiasts and other users of this area.

However, the ACMA has said that they have identified the 403 - 430 MHz sub-band for exclusive government use, and will be transitioning other users out of that area over the next few years.

Up until the late 90's, we had full access (on a Secondary basis) to the 420 - 430 MHz range. This was changed, initially due to security arrangements for the Sydney Olympics, and restrictions were placed on operation in certain frequency ranges within certain areas (NSW, ACT, Melb, Perth). This situation still stands.

What the latest ACMA proposal says is that the 420 - 430 MHz range will now be reserved exclusively for government use. So, goodbye Amateurs. I think in the minds of many, we had already lost that segment. However, this proposal now sets the loss in concrete.

## EVE

On March 25<sup>th</sup>, a group of German amateurs from AMSAT-DL achieved the first amateur planetary "bounce", receiving their own echoes back from Venus. They used the 20 m Bochum Observatory dish, transmitting 5 kW on 2.4 GHz (close to 1 Gigawatt ERP). The receiver used very long integration time and narrow bandwidth to pick the very weak reflections out of the noise after the 100 million km, 5 minute

round trip. More details can be found on the AMSAT-DL site:

<http://www.amsat-dl.org/pic/gallery2/d/7561-1/AMSAT-Venus-PM-E.pdf>

### **John Moyle Field Day**

After having magnificent weather and band conditions for the Summer VHF/UHF Field Day, the JMFD turned on the complete opposite conditions in the south of the country with the weather little short of appalling in some areas. I spent Saturday afternoon at the Bushfire Benefit Concert at the MCG, and I had first-hand experience of two deluges and extended periods of very ordinary conditions there!

However, the award for the worst experience (and a story that will no-doubt be retold for many years) would probably go to the VK2SMC group who set themselves up (or attempted to) at their usual site near Cabramurra in the Snowy Mountains. Over to David VK2IDM:

*Apologies to all that were looking for contacts from VK2SMC but the weather unfortunately got the better of us this time.*

*The team (Rod VK2TWR, Glen VK2CCW, John VK2IJM and I) arrived at the site on Saturday and after setting up the sleeping tents and the equipment shelter we were unable to raise the tower and commence contacts due to a severe approaching electrical storm. The brunt of the storm hit us just after 3:00 pm and it continued until about 5:30. The wind gusts were extreme and resulted in structural damage to the equipment shelter. The 20 mm of rain also infiltrated some of the sleeping tents and made the entire site very soggy. After the weather cleared we set about drying off wet gear and making repairs to the equipment shelter and with sunset looming we also focused on getting the BBQ and dinner preparations under way, but still hoping to get on air as soon as we finished our much awaited dinner (steak, sausages, veggies and bottle of red wine).*

*However our hopes of getting on air were dashed again just after dinner when a second and even more severe storm front came through dumping well over 20 mm of rain (yet again) and with even more severe lightning strikes. This second front didn't move out until after 10:00 pm but with more damage to the shelter and another drying out period we were unable to get on the air on any band. We unanimously decided to put the kettle on, have a warm cuppa and then head off to bed. There was a moment of humour when a very close lightning strike hit just after Glen had retired into his tent, which resulted in Glen sprinting 100 m in his underwear to take safe refuge within his motor vehicle Faraday cage.*

*However, any thoughts of the weather eventually abating and allowing us a good night's sleep were dispelled when a powerful wind front hit shortly after 11:00 pm. The temperature also dropped from 11 degrees to just above zero and there were moments of sleety rain in the gales that followed. Glen's tunnel tent was ripped from its anchors and he spent an uncomfortable night battling to keep his tent on the mountain.*

*The next morning felt like mid winter with the thermometers barely above zero and a gale force SW wind blowing. We decided to let the gear dry and to decamp ASAP and to retreat to the warmth of much lower altitudes.*

*Yes, we took a battering and ultimately we were defeated but we will definitely be out there again next year to try it all again.*

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

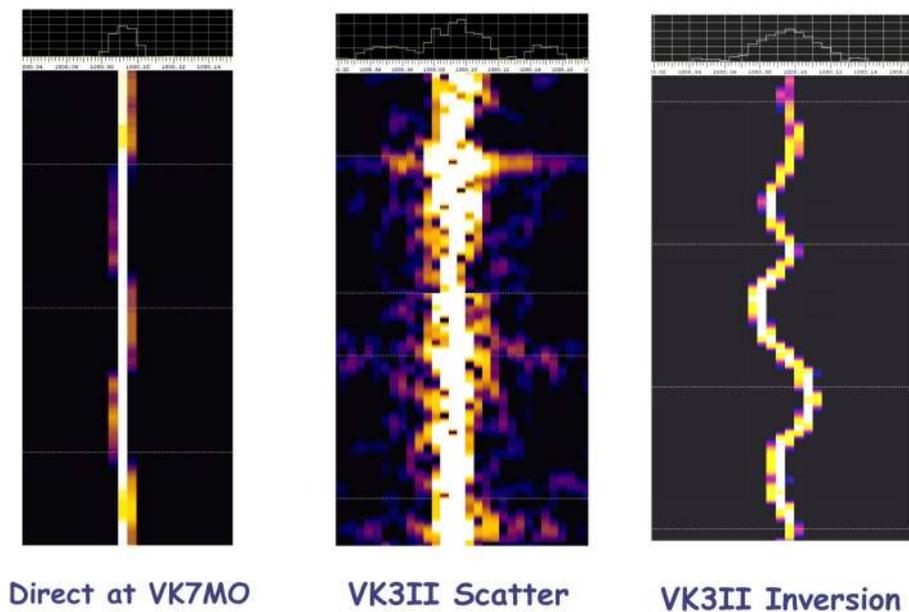
# Digital DX Modes

Rex Moncur – VK7MO

Congratulations to John VK4JMC and Bob ZL1RS on completing an FSK441 contact across the Tasman over a distance of 2193 km.

Welcome to Phil VK4FIL and John VK7XX who have been joining in the weekend 2 metre, meteor scatter activity sessions. John is also operational on 2 metres with JT65.

The use of GPS locked rigs and the waterfall audio analysis program, Spectrum Lab, provides the opportunity to examine the effects of propagation on signals at bandwidths of a few milliHz and explore such issues as the frequency spreading on tropo-scatter. Figure 1 shows some initial results between Jim, VK3II and Rex, VK7MO on two metres over a 520 km path. The horizontal scale on the graphs spans around 0.2 Hz or 200 mHz and the width of the bins is 5 mHz. The left-hand graph was produced locally from separate GPS units. It shows some minor frequency drift of less than 5 mHz. A separate test between Jim and Dave VK3HZ showed similarly stable signals over a relatively short distance. The vertical scale is approximately 30 minutes.



**Figure 1: Shows Frequency effects on VHF signals**

The centre graph shows broadening of the VHF signal presumably due to the multi-pathing effects of tropo-scatter. The spreading is surprisingly small and generally within around 50 mHz with the major excursions possibly due to micro-meteors. The right-hand graph was produced on a night where there was an inversion present and the slow, almost sine-wave, drift might be explained by the rising and falling of the inversion layer introducing Doppler shift. Later tests have shown a similar narrowing of the frequency spread during inversions but without the slow sine-wave variations. Also later tests have shown variations in the amount of spreading on a scatter path

by a factor of four to one on different nights. While this is early days it appears that through the use of GPS locked rigs and very narrow bandwidth waterfall programs there are interesting opportunities for hams to explore various forms of propagation.

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

## **The Magic Band – 6 m DX**

Brian Cleland – VK5BC

Conditions continued to be poor during March with no 'E' openings reported and very limited TEP openings to JA from northern Queensland.

Kevin VK4BKP reported hearing JA beacons on the 14th March.

The best opening for the month to Japan occurred on the 15th March with the opening extending south to VK5. Garry VK4ABW north of Townsville worked Kazu JA1RJU, Masa JA6TEW and Ken JA5FFJ. Kevin VK4BKP in Mackay also worked JA1RJU and reported hearing the JE7YNQ and JA1ZYK beacons. Meanwhile Brian VK5BC reported the 49.750 MHz carriers up to S9 and the JA6YBR beacon S4 and eventually around 0800UTC worked JA6TEW and JE6AZU. This was the 1st JA opening to Southern Australia since April 2007.

On the 17th March Ray VK4BLK in Yeppoon worked JG3LEB.

The Tablelands Radio and Electronics Club report that they have received approval for a 6 m beacon VK4RHT on 50.281 MHz to be located west of Mareeba in QH23pc. They hope to have the beacon operational shortly - look forward to hearing it.

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