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# VHF/UHF – An Expanding World

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David Smith VK3HZ

## Weak Signal

David Smith - VK3HZ

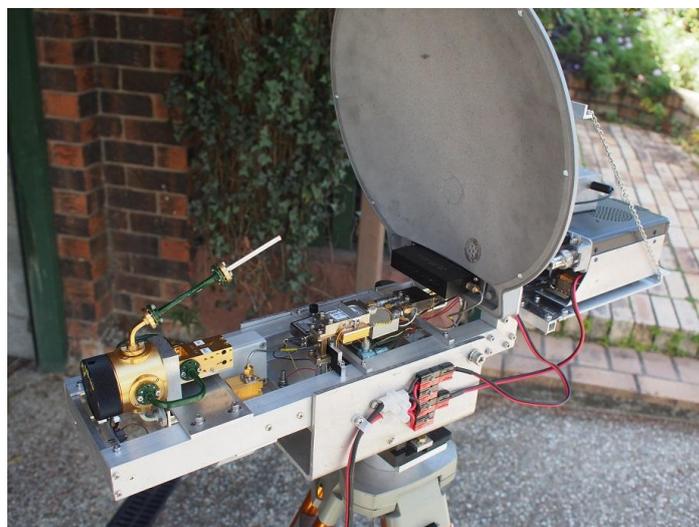
The season's first crossing of the seas to ZL on 2 m occurred in late September. On the morning of the 23<sup>rd</sup>, Norm VK3DUT reported hearing the ZL2WHO/B beacon in central North ZL peaking at 5x1. In turn, Harry ZL2ADU reported hearing the VK3RGI beacon over a period of several hours peaking to 5x4. However, no contacts were made on that day. The following day, September 24<sup>th</sup>, at 2215Z, ZL2ADU worked Colin VK2BCC on CW with reports of 529 and 559. They then managed several SSB contacts, peaking to 5x3 before the band closed.

## New 76 GHz VK4 Record

Doug Friend VK4OE writes of his recent activities on 76 GHz:

*I wish to report that on Wednesday the 3rd of September, Rex VK4REX and I completed what seemed to be an easy contact on 76.0321 GHz over a distance of approximately 91 km. Rex was located at "Howells Knob" in the Sunshine Coast hinterland and I was located at Mt Gravatt in suburban Brisbane. Due to the line-of-sight (LOS) path and the cool dry day, two-way SSB signals were loud and clear at each end, 5x7 and 5x8. We will be making a claim for an initial VK4 distance record for this band.*

*This result is the culmination of several months of testing and transverter construction and development on both our parts - and the two transverters we are using are completely different in design (single conversion versus double conversion), with different IF frequencies and tuning range of the final radios that we used. Rex's transverter generally follows the published DB6NT design with an IF in the 70 cm band, and has a Kuhne electronics 76 GHz amplifier that's used in both RX and TX. My transverter is a double conversion design with a first IF of around 4.3 GHz, mixing then down to 1282 MHz. Mixer and pre-amplifier are from "the rf guy" (US eBay) and the pre-amplifier is also used in both RX and TX by way of the WR12 waveguide switch that's there at the 'front' of the assembly.*



**VK4OE's 76 GHz System**

*For most of the QSO, my transverter was being used with the "pre-amplifier" in both RX and TX modes by way of the waveguide switch that needs to be changed every time from RX to TX and back. But towards the end, I was clearly hearing Rex's signal with the waveguide switch in the 'straight through' position, meaning no pre-amplifier in circuit. Rex also heard me, although he asked why my signal had just become quite weak compared to before. That demonstrates how strong signals were on the day! Just gotta love copying those weak signals, whatever band they're on!*

*We believe that there will be significant path length extensions possible in the future, after we get dish pointing accuracy conquered!*

*We did try a longer LOS path later in the day but, on the day, we could not 'find' each other, such are the vagaries and challenges of getting signals over longer paths on this band in this part of the country! Since then, we have been waiting in vain for another suitable day with cooler and dryer weather.*

*It is interesting that we VK4 operators chose (some time ago) to use the same 76 GHz operating frequency that is 'commonly' used in Europe (amateurs are a 'secondary service' in VK on this frequency) whereas the VK3 experimenters on this band are using a different frequency around 78 GHz which is also in a 'secondary service' part of the band, the 'primary service' part of the band in VK being from 77.5 to 78.0 GHz.*

*That experimenters in two parts of the country are using different parts of the band GHz away from each other has just developed that way ... at least it's unlikely that there will ever be contacts happening between the two call areas!*

*Hey everyone, there is lots of fun available for the taking on the mm-wave bands!*

### **Dural Beacons All Back On Air**

After a longer than expected outage, Mark VK2XOF reports that the Dural 2 m and 70 cm beacons are back on air with new antennas. The antennas came down for the renovation of the roof of VK2WI. However, the expected 4 week roof replacement tuned into a 4 month job.

The 6 m and 23 cm beacons have continued to operate throughout the period.

Reports welcomed please.

Please send any Weak Signal reports to David VK3HZ

## **Digital DX Modes**

Rex Moncur – VK7MO

### **New 24 GHZ digital record over 566 km**

On 20 September Rex VK7MO, operating about 30 km West of Mannum, South Australia worked David VK3HZ, operating from Mt Macedon, Victoria via aircraft scatter on 24 GHz to extend the VK Digital Record from 461 km to 566 km. Rex was running 20 watts to a 1.14 metre dish and David 4 watts to a 0.6 metre dish. This success followed a number of failures in tests over 600 km even though easy 10 GHz SSB aircraft scatter QSOs were possible. The major difference in going up from 10 to 24 GHz is atmospheric losses due mainly to water vapour. As the distance increases these losses increase both due to the longer distance but also because at

longer distances it is necessary to beam lower to the aircraft and thus through denser atmosphere with increased losses. The digital mode ISCAT-B was used as this copes well with the short bursts of signal that are characteristic of aircraft scatter on the upper microwave bands. A more detailed report on this QSO is at: <http://www.vk3hz.net/microwave/566km-24GHz.pdf>

Please send any Digital DX Modes reports to Rex VK7MO

## **Meteor Scatter**

Dr Kevin Johnston – VK4UH

Most regular Meteor Scatter operators reported September to have been a disappointing month with generally “flat” conditions compounded by a smaller number of operators making it on-air for the weekend activity sessions - almost a self-fulfilling prophecy. Further there were no major meteor showers in evidence in September. As spring progresses however, we will expect a general up-turn in the return rate from random meteors entering the earth’s atmosphere and activity should improve as the Southern Hemisphere leans towards the sun. The start of Daylight Saving in the Southern and Eastern states will also help to push activity back before dawn, when meteor return rates are better, if only for the northern stations.

October will also bring the Orionid Meteor shower, a Class 1 major event, expected to peak on or around 22nd of the month. There may also be some improvement from a number of smaller showers expected around the same time. As Arie VK3AMZ points out “The Orionids can be an unpredictable event and, like the Eta Aquarids in May, are due to the Earth passing through the “other end” of the trail of debris and remnants of Haley’s Comet”. The ZHR predicted for the Orionids is lower (25/hr) than for the Eta Aquarids but should still provide excellent propagation even up to 432 MHz on MS. Also make a note in the diary for the Leonids shower expected to peak around 18th November, another Class 1 major event. Operators in SE VK4 and Northern VK2 are still looking for some Meteor Scatter activity from stations to the North and Far North of VK4, and would encourage any digital-ready 2 m operators to join in the Saturday and Sunday morning activity sessions on 144.230 MHz FSK441.

Please send any reports, questions or enquiries about Meteor Scatter in general or the digital modes used to Kevin VK4UH