
VHF/UHF – An Expanding World

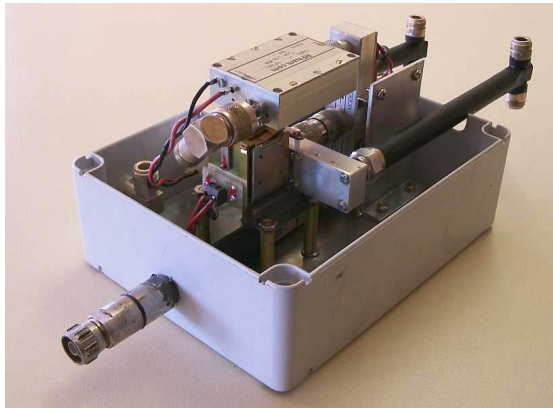
David Smith – VK3HZ

Weak Signal

David Smith - VK3HZ

With not a lot happening on the terrestrial propagation side of things, it's probably a good time to have a look at the local EME scene where there has been a bit of recent activity.

EME operation on the 23 cm band has had a recent surge of interest with a number of new stations becoming active. Doug VK3UM has completed installation of a new dual band feed (70 cm / 23 cm) for his monster 10 m dish and reports "satisfactory" results. Over the weekend of 4/5 March he reports working 26 stations on 23 cm. On the following weekend, during the DUBUS contest weekend, he reports working 35 stations on 70 cm. Unfortunately, as is often the case, these contests are run when the moon is in a northerly declination, favouring the European and US operators, but giving us poor southerners only a limited window in which to work them.



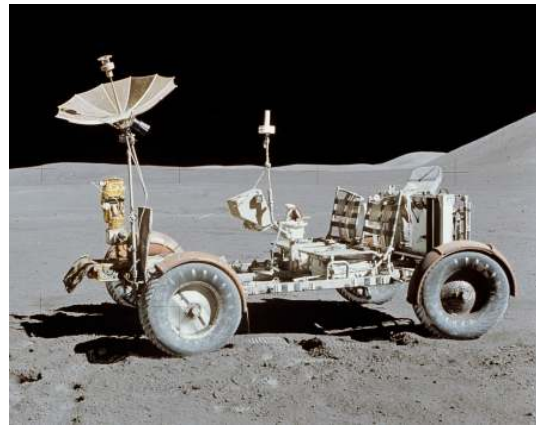
VK3UM New 23cm Dish Feed Switching and Preamp

Trevor VK4AFL has also recently commenced operations on 23 cm using a 3.7 m satellite TV dish. While he is finding the dish size a little on the skinny side for EME operations, he has nevertheless detected his own echoes running as little as 35 watts – not a bad feat.



VK4AFL Dish and 23 cm Feed

Rex VK7MO has also recently erected a satellite TV dish and become QRV on 23 cm EME. His dish is only 2.3 m in diameter, but he has had some good results, able to work similar size stations. Of course, most of Rex's contacts are using JT65 digital mode. He lives in an area with a good view over Hobart so his neighbours tend to be, somewhat understandably, sensitive to any sort of intrusion in their view. While radio antennas might be a visual feast for amateurs, they don't have quite the same appeal to the layman. Therefore, Rex has devised a "balcony portable" type setup that can be rolled out of sight when not in use. Nevertheless, his dish has been spotted by the neighbours, with comments that it looks like he's setting up for a moon landing.



Both of these are used for Earth/Moon communications. Which one lives on Rex VK7MO's balcony?

While we're on antenna photos, Kev VK4KKD (of "One Man Tower" fame) sent in some photos of his portable antenna setup on its first trial. With the help of Wayne VK4WS and John VK4ZXS, Kev erected the system on a mountaintop near Laidley S.E. Qld for final adjustments. The system consists of 4 x 12 el DL6WU on 144 MHz and 8 x 28 el DL6WU on 432 MHz. The array is 6 m x 6.4 m x 4.5 m with the top antennae at 10 m above ground, all mounted on a trailer. The antennas can be pointed upwards for possible EME use. Kev intends to visit many grid squares and should put out a decent signal with this setup.



VK4KKD Monster Portable Antenna Array

Aircraft Enhanced Propagation

The morning aircraft-enhancement sessions continue on 144.2 MHz between 8 am and 9 am.

There has been much discussion about the mechanism by which the presence of an aircraft enhances VHF propagation, and I continue to be amazed at the level of that enhancement. Chris VK2DO puts in a mighty S9+ signal at this QTH at times, and at other times is barely audible. While the “S” (guess) meter is rarely an accurate gauge of signal strength, I would estimate the variation in signal level from normal conditions to “aircraft enhanced” to be of the order of 30 to 40 dB.

What aircraft / aircraft type are causing this? Where are they located relative to each of our stations? Which way are they flying? It’s been very difficult to find this information in the past.

However, now it is possible, in real time, to see the aircraft flight paths on a virtual radar screen on your own PC. This is possible due to the introduction of an aircraft position-reporting system known as ADS-B. Suitably-equipped aircraft (mandatory for all aircraft by 2009) “squitter” (transmit) their position information to anybody in the vicinity with an appropriate receiver. The system was originally intended for collision-avoidance between aircraft, but is being extended for future possible use by air traffic control and others. An overview of the system can be found here: www.auf.asn.au/navigation/adsb.html

A UK company has developed an ADS-B receiver and PC software to allow anyone to receive and display current aircraft information: www.kinetic-avionics.co.uk/sbs-1.php The range of the system is dependent on your line-of-sight (ADS-B downlink is on 1090 MHz) but can be up to 400 km.

A system has been set up in the Sydney area showing local flights: yssyradar.inside.net You will need to register to get real-time data, otherwise a 10 minute delay is added.

So, a network of these receivers along flight paths between Melbourne, Canberra, Sydney and Brisbane could provide valuable information for the aircraft enhancement operators.

Microwaves

Russell VK3ZQB, Colin VK5DK and Trevor VK5NC have recently been enjoying their annual microwave operations in Queensland. Despite the rather appalling weather, they achieved some new VK4 record distances. Russell reports:

We have just returned from VK4 where, as well as having a holiday and visiting some family, we had a go on 5 GHz and 10 GHz from Cairns to Airlie Beach and later from the Bunya Mountains to south of Millmerran on 24 GHz.

On 17th April, I set up on a hill near Malanda and Colin and Trevor were on a hill near Cape Gloucester – a distance of just over 417 km. On 5.7 GHz, we made contact at 0403Z, exchanging signal reports of 5-7 and 5-9. My transmitter power was 20 watts and Colin's was 16 watts. This considerably exceeded the previous best VK4 distance.

We tried to make a contact on 10 GHz and Colin heard my signal at about 4-1 but I could not hear him at all. Conditions at my location were extremely poor with heavy rain and low cloud.

I returned to Cairns to check my transverter and found a problem with the oscillator.

We returned the next day to make another attempt on 10 GHz but could not make contact. We tried 5.7 GHz again and found the signals were weaker than the previous day. Severe rain scatter distortion was experienced and once again, I was in low cloud and heavy rain.

We abandoned any further attempts to make contact from these locations.

On return to the Brisbane area we decided to try and extend the 24 GHz record.

On 23rd April, I went to the Bunya ranges and Colin and Trevor were at Mt Domville, 128.8 km away. We established contact with VK5DK/VK5NC on 24048.1 at 0353Z exchanging signal reports of 5-5 each way.

At 0409Z, after optimising the dishes, we again contacted and exchanged reports of 5-9. This is an increase of 10 kilometres on the previous VK4 record.

Thanks to Russell VK3ZQB for that report.

The UK Microwave Group (UKuG) publishes a monthly magazine – Scatterpoint - that contains some quite interesting microwave projects and information. UKuG's policy is to reserve the current year's issues for members only. All of the 2004 issues of Scatterpoint have now been placed in the public domain and can be accessed and downloaded from: www.scatterpoint.org

At the end of 2006, all ten 2005 issues will be added to the free archive and the process will be repeated each ensuing year. UKuG hopes that this archive will be a source of useful amateur microwave information for all. Material published in Scatterpoint is available for other non-profit amateur radio organisations to use in their publications. Just mention UKuG Scatterpoint when you use it.

If you would like to receive the latest magazines, then you do not need to live in the UK to be a member of UKuG – they already have many international members.

Please send any Weak Signal reports to David VK3HZ

Digital DX Modes

Rex Moncur – VK7MO

Welcome to Gary, VK4ABW, near Townsville and Peter, VK2IT, in Sydney who are both operational on 2 metres meteor scatter on FSK441. Gary has worked VK4AFL and VK2EAH on Meteor Scatter and is also operational on EME using JT65. Peter VK5ZPG has his system going well and worked AI, VK4EME, over 1585 km on meteor scatter and also VK4AFL.

Congratulations to Rhett, VK3VHF, on his first EME contact with W5UN using JT65. Rhett achieved this after many attempts using only a 7-element yagi and 100 watts. Rhett is also very active working up to VK4 during the weekend meteor scatter activity sessions.

Tests on the Newcastle channel 5a TV video carrier confirm that it is an extremely stable reference on 138.276025 MHz, with a drift of less than 1 milli-Hz over the last two months against a GPS locked reference.

Joe Taylor, K1JT, advises that he is testing a new mode that uses only 5 Hz bandwidth and can decode at -28 dB, with reference to an SSB passband, without the need for the station to be included in the call.text file.

Please send any Digital DX Modes reports to Rex VK7MO

The Magic Band – 6 m DX

Brian Cleland – VK5UBC

Another very quiet month on 6m with very few reports of any propagation during April.

Norm VK3DUT reports a bit of AU on 14th April (K index 7) with the VK7RST beacon up to 529 AU and on the 15th April he worked Ray VK4BLK at Yeppoon 5x9+. Norm also reports strong ZLTV on 25th April and again weak ZLTV on 4th & 5th May.

There hasn't been any sign of JA activity down south but there have been a few JA openings to Northern Queensland and WA. John VK4FNQ in Charters Towers worked JA1VOK on 5th April and then both John and Gary VK4ABW in Townsville worked several JA's on 7th April. Gary also worked JA's on 17th & 27th April. Also on 17th April, Wayne VK4ZRT at Gladstone reports an opening to Japan working several JA's.

On 11th April, Gary VK4ABW worked DS1MFC in Korea and on 15th April worked Jon VK4CY in Brisbane. This was followed by a good contact with Norm P29NB in PNG on 16th April. Great to see 6 m activity from P29.

The VK6RSX beacon in North West WA is regularly reported being heard in Japan.

Please remember to send any 6 m information to Brian VK5UBC