Frequencies VHF, UHF, SHF Newsletter NZ

This newsletter is compiled by Kevin Murphy ZL1UJG to promote operational and construction activity on the VHF, UHF and SHF Amateur Radio allocations in New Zealand...(and overseas).

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Previous issues – http://www.netspace.net.au/~rpreston/index.htm

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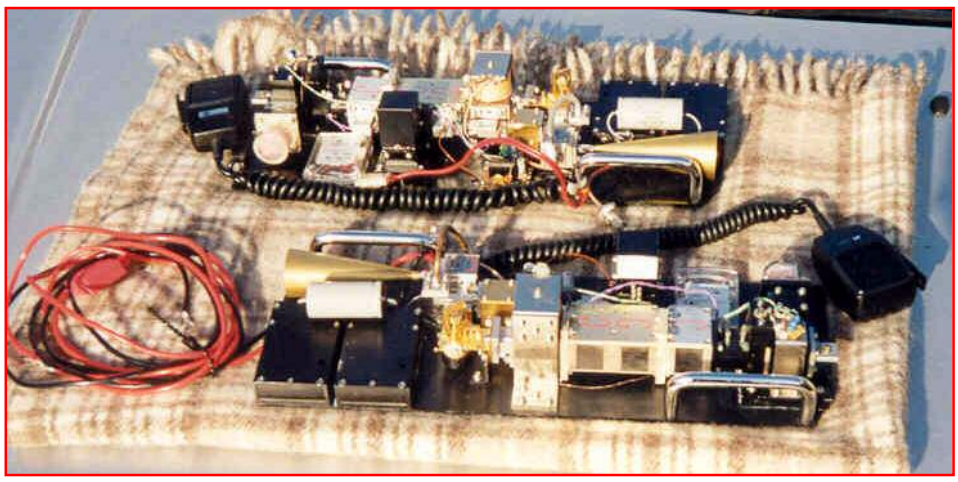
2.5 mm band ZL activity

Ralph Sanson ZL1TBG and Steve Hayman ZL1TPH

It was decided to construct a transceiver system based on the full duplex transmit carrier mixing principle - "gunnplexer" / "polarplexer" schemes - for the millimetric bands. The highest frequency generated to date is 122.4 GHz and for now this is referred to as "top band". Some weeks were spent testing various mixer and multiplier schemes and the best performing setup was duplicated. Transmitter power is around 1 mW and receive performance necessarily poor as a simple diode. mixer is used



Horn antennas were chosen because fabrication accuracy and mechanical alignment of reflector antennas would need to be in the order of 0.3mm, and a 30 dBi gain horn only needed to be 40 wavelengths long.

The stations were set up along an airfield runway, myself ZL1TBG and Steve ZL1TPH manning the dials and microphones for the first attempt in ZL on this band. On the day of testing, the best distance obtained was 32 metres, for full duplex readable communication. Further distance was tried however the signal faded away too abruptly to improve on this distance. I believe the path loss at that range is 104 dB. We did not have any problems with rain in the path, however shutting the hatchbacks on the vehicles lost quite a bit of signal, and temperature changes had to be tracked for narrowband FM (AFC on the IC-R100 receiver helped).

Despite the source oscillators being cavity controlled Gunn diodes, frequency stability was not as big a problem as expected. The transceivers were powered continuously to eliminate startup drift. The hardest job was to align the antennas in both planes while listening for the noisy carrier. The world record for this band is in the order of 12 Km, by tropo duct. The previous record was around 1.2 Km, and the higher bands are still in the order of 50 m.

Problem ☹ What is the best way to remove moss from an antenna with a wooden boom ? Unfortunately this one is too high to reach. We have thought of transmitting high power but this may result in self-destruction of the above item. Application of RF to antennas in moderate amounts hinders moss growth…☺ Answers to the editor (Note :- this is not my antenna !!)

ZL3TEN & ZL3SIX/B Beacons

The ZL3TEN 28.228MHz and ZL3SIX/B 50.040MHz Beacons are back on air due to major overhaul just in time for the F2/ES season. Mike Foubister ZL3TIC
Reports to: service@mycom.co.nz

NZART VHF Field Day **(Information received direct or via the Yahoo Group ZLVHFCONTEST)**

This was held on the 7th and 8th of December,2002. Stations from as far north as Kaikohe to Christchurch were known to have taken part. To the right is **Murray ZL3MH** in the Christchurch Port Hills. He heard ZL3NW. The Christchurch path northwards is known to be excellent when open (via **Tom ZL1THG** experiences) Please beam towards Murray so his efforts are rewarded (Editor)

From **Steve ZL1TPH** Best Dx from Moirs Hill…
144 MHz ZL2WA 535 Km 432 MHz ZL2WA 535 Km
1296 MHz ZL1BK 315 Km 2424 MHz ZL1BQ 120 Km
3400 MHz ZL1TBG 9 Km 5760 MHz ZL1AVZ 45 Km
With the intense storm, and heavy rain and lighting strikes on Saturday night he was somewhat perplexed, in regards to propagation into ZL2WA on 432 MHz at a distance of 535 Km considering that conditions seemed not enhanced by tropo but maybe by some other form of propagation ??? (I have heard of lightning enhanced propogation- editor)
The ZL2ALW team's(@ Ranginui) signal's were the loudest at Moirs hill at distance, irrepective of antenna direction or power level
Following along with the contacts of ZL2WA are some pictures from the **ZL2WA** setup in what looks like a fine spell in the weather (Pictures by **Steve ZL2TUV**, sent by **Leon ZL2AOC**)

Andrew Barnett ZL2ALW and the team of ZL1QF, ZL1UEO, ZL2UTV

The weather as usual on this weekend proved to be a real challenge. We encountered every thing except hot sunshine, from mist and high wind, to hail, high wind and cold, and to top it all off as soon as we had packed the last bit up in the cars to return home the sky cleared, and you could see for 50 or so Km.

On 2M we had 100 contacts, from Bay of Islands in the north to Plimmerton in Wellington. On 70cm we had some problems with damaged LMR240, high SWR and rotator issues, so the were just a few contacts made with the rubber duckie on the FT817 (the editor was fortunate to be one of those contacts). On 1.2G one contact was made using a dipole during the worst weather and some more using a 1.2Meter dish on Sunday as the weather cleared. 6 meters was no good just too much local QRM from the Telecom installation.

Signals from Wellington at about 330 Km and Manganui Bluff at 337km were about the same except the northern signals had a deep fade every few seconds. Steve ZL1TPH was very strong, as was Harry ZL1BK on Mount Taranaki.

ZL1IU, Kaikohe was heard both north and south , so his signals must be bouncing off something south of the site, the strength of them was the same or better sometimes to the south.

Some new stations were heard and worked this year, and there were even a few pileups, which has been rare in the recent past. Thanks to everyone who braved the weather and setup a field station, and also to those who put the home station to good use and gave out points.
Andrew Barnett ZL2ALW

Harry ZL1BK (Site picture left) on Mt Taranaki
After 4 hours his big gelcell (80 AH) went soft and relinquished the 100 watts 2M Amp in favor of the 10 watt Icom IC 260 2M transceiver. He managed a 1296 MHz contact with ZL2ALW while they had a temporary dipole rig at their end.

ZL1BQ Auckland VHF Group (via **Peter ZL1UKG**)
The station ZL1BQ was operated by Vaughan Henderson ZL1TGC, Peter Loveridge, ZL1UKG, Tim Moore ZL3VTV, Roger Phillips ZL1ASV, Franc Dunatov, ZL1SLO

The weather was not auspicious and a cloudburst on the drive up saw us headlights on, wipers at high speed and car at reduced speed for safety. At the site, and exposed ridge at almost 500m there was constant wind and damp/rain all of Saturday. However the sturdy tent failed to blow down overnight and the weather dried out on

Sunday while the wind continued. One pole now has a permanent banana shape and will be written off. Polypro and parka was worn all weekend. The gear worked well all weekend after a little improvisation to get some bands erected. Some lower loss coaxes had been obtained but the convenience of polarisation change-over relays had been lost. The 70cm linear only had an FM time constant for change-over and may have sounded odd to listeners when working sideband, with lots of relay clicks being heard.

There appeared to be an "Iron curtain" at Taranaki with New Plymouth only worked once in the last hour. ZL1ALW @ 338km and ZL1BK @ 397km were always weak. Gone was the "Nelson every hour on 2m and most on 70cm" of 2 years ago. The microwave bands were big contributors to the score. At the line-of-sight distances you would hope that it would be easy to work over the horizon but experience has been disappointing in the past. The big surprise was a 2m opening to VK3 across an intense electrical storm in mid-Tasman allowing ZL1/VK3 and ZL2/VK2 with good signals. Bob Gyde had tracked this storm on 6m as openings moved south along VK4, VK2, VK3. An estimate gave 5000 lightning strikes in 8 hours or 1 every 6 seconds.

A Honda 2.2 kVA generator was used which was found to be very economical on fuel in conjunction with a choke input filter supply for 6, 2, 70, 32 and a gel-cell per band for the higher bands. A cell change was required for 8w FM @ 1296 MHz. Thanks for information sent in regarding Field Day Activities

Contests

Cliff Betson Memorial Field Day **11th and 12th January2003**

All Bands 50 MHz and Up

The operating periods are 1600 to 2200 on the Saturday, and 0800 to 1400 on the Sunday

Aligned with the Australian Ross Hull Field Day

Steve ZL1TPH is expected to operate from Moirs Hill, near Orewa looking for 144 and 432 MHz contacts with stations in the Wellington region (or further)

News from Murray ZL3 MH

Murray Hely ZL3MH

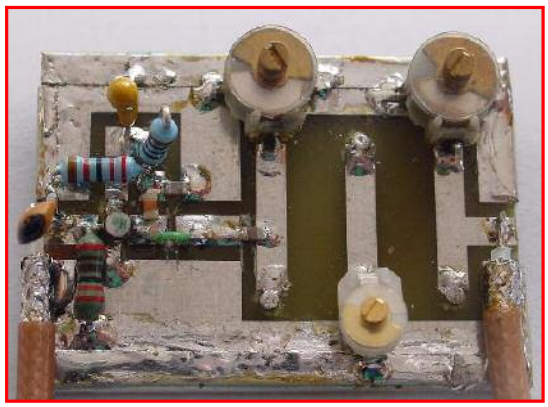
Murray ZL3MH is wondering if anyone is experimenting with the MRF317's that come out of (AWA?) modulated final of 25 watt AM repeaters They are 28 volt devices suitable for amplifiers in the 80 – 100 watt range with gains in the region of 10 dB See http://hjem.get2net.dk/ole_nykjaer/oz2oe/.

Contact the editor if you wish to contact Murray

Last year in Late Feb-March I went to the Eastern States of Australia. I had one day spare to do AR so a went to the Wyong Field day. This is the largest day of it's kind in the southerm hemisphere with some 2000 people attending. It is a hour and a half by train and cost $11.70 return, so it is a very cheap day out. See Associated picture of the 6 Meter group. I also meet VK2ZAB and VK2KU there which I had worked many times on two meters.

Murray is working on improving his signals to VK with a ICOM IC202S, High Power AM17 AMP (4CX250) and long yagi for 2M. (I am sure his signals will improve this side of the Tasman as well – editor!)

1152 MHz Oscillator



384 MHz Multiplier. I rematched the x 4 multiplier input and output. The input was matched with a capacitive divider to reduce drive. The trim cap on the output was at maximum capacitance with 3 turns and minimum capacitance with 4 turns? I removed the trim cap altogether. With another turn on the inductor (4 turns) the power was +10 dBm and device current was 17 mA @ 6.3V Vce. Spurious rejection was > 40 dB except for 288 MHz product @ -35 dBc.

384 to 1152 MHz Multiplier

The multiplier uses a 2SC2367 8 GHz device. The drive is +7dbm. The output was ~ 0 dBm. However adding a small airwound inductor of 0.5 turn ~2mm ∅ increased power to ~ +5 dBm. (improves the matching between the transistor and 50 Ω). The transistor is biased so that RF drive decreases the base operating point enhancing the generation of harmonics. The collector is fed via a 0805 SMD 100nH inductor.

Although the end of the PCB is cut off for layout reasons, there is an additional MAR-4 MMIC Amplifier to increase the power to about ~ +13 dBm. (On the mixer PCB is a 3 dB attenuator to reduce power and improve the match.)

The MMIC output is fed via a 100nH inductor and decoupled by a 12 pF capacitor. This resonates at 144 MHz to notch out any noise present at IF frequencies.

VK/ZL Openings

There have been a number of times in the last few weeks where there has been tropo type openings between VK and ZL on 2M and 70 CM. As recent as today (January 2, 2003) there has been good conditions across the Tasman. Bob ZL3TY has worked into VK quite a number of times recently.

Also today I was monitoring 144.2 SSB while a group of us were looking to work Peter ZL1UKG on Mt Ruapehu on 144, 1296 and 2424 MHz. Stations heard included **Nick** ZL1IU, (Kaikohe) putting a good signal into Hamilton, **Steve** ZL1TPH,(Moirs Hill), **Harry**,ZL1BK, (Auckland), **Ray** ZL2TAL, New Plymouth. Ray succeeded in putting good signals up to Auckland and Moirs Hill on 1296 MHz.

Rig Modifications

Icom IC202, There are many of these SSB/CW VXO rigs in circulation (Editor has one) and there are simple modifications to improve the sensitivity. http://ns1.mesh.net/~g4fre/Ic202rx.htm & http://www.qsl.net/pe1hwo/ The last site also has mods for the IC402

Yaesu FT221/FT225. Also mods /information for the elderly FT221/R http://www.qsl.net/pe1hwo/FT225RD/. Replacement Front ends from Mutek are available.

Often in RX, RF stages are fed via LPF circuitry that is used to clean up the TX and rewiring the RX so that this is bypassed may gain a few dB.

For Sale

Belcom Liner Four Thirty, VXO controlled SSB & CW only transceiver. Power output 10W.(see picture)

In good condition and comes with instruction manual and circuit diagram. $100 ono + freight.

Contact Scott ZL1KB 09 828-5891 or packet ZL1KB@ZL1AB

Surplus Qualcomm parts

Chuck Houghton WB6IGP has Qualcomm synthesizers available for US$35 each with 10 MHz TCXO at US$15 each plus postage. Also has 1296 amps at 1 watt for $15 and its brother a 5-8 watt 1296 amp that requires conversion by lifting lid to add 3 chip caps to get to 1296 MHz for US$20. Have lots of other things for microwave use.

Our DRO oscillator runs at 2620 stock and can be converted to some specific frequencies between 2400 to 2700 MHz cost US$15 each and requires a 10 MHz clock TCXO oscillator. Better synthesizers VCO type are US $35 each and are controlled by Qualcomm synthesizer chip. To convert pin for pin programming covers 1 or 2 or 5 MHz step size from 2200 aprox to 2700 MHz.

See information at http://www.ham-radio.com/sbms/sd/

Look under Technical papers from the San Diego Microwave Group for full details. Color pictures and conversion details. Email Chuck Houghton at clhough@pacbell.net for further information.

Chuck also has many other miscellaneous RF devices, both Bipolar and FET.

As with all modified Qualcomm material, DO NOT CONTACT QUALCOMM for information on these devices

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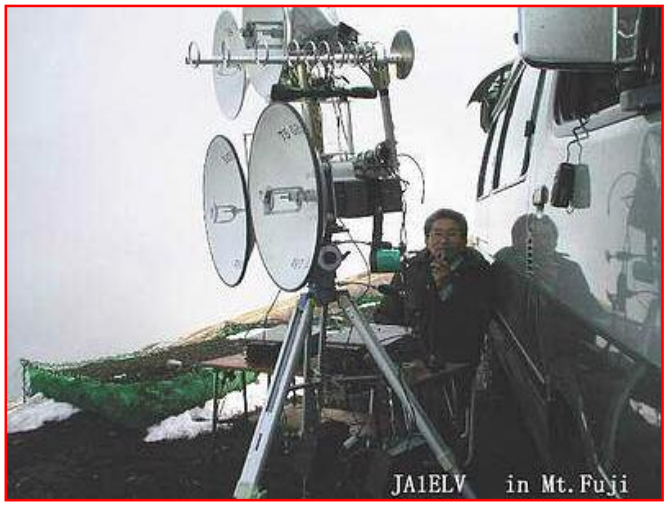

Photo left shows how serious some Microwave activity is in Japan (Picture via Steve ZL1TPH)

Below is a image sent by John W3HMS of his Rover setup. In the US mobile stations loaded with microwave equipment give points and multipliers to their fixed Ops. More details of the rover setup in a later issue

DUBUS SUBS 2003, (VK's and ZL's)

Please forward AUS$45 subs in the normal manner (cheque or money order) to

Doug McArthur
'TIKALUNA'
26 Old Murrindindi Rd
Glenburn Vic 3717, Australia

CUT OFF for subs is the first week in February 2003

Twin MRF646 Amp

Brian Wilson ZL1UXB/VK3UXB picked up a single MRF646 70 cm board from the Waikato VHF Group at the Hamilton sale, The **AR**(?) article that came with it mentioned a higher powered amp using 2 MRF 646s. Brian is looking for the article on the twin MRF646 amp. Please contact the editor if you have further information.

Best wishes for 2003 to you all
Kevin (ZL1UJG) and Mary