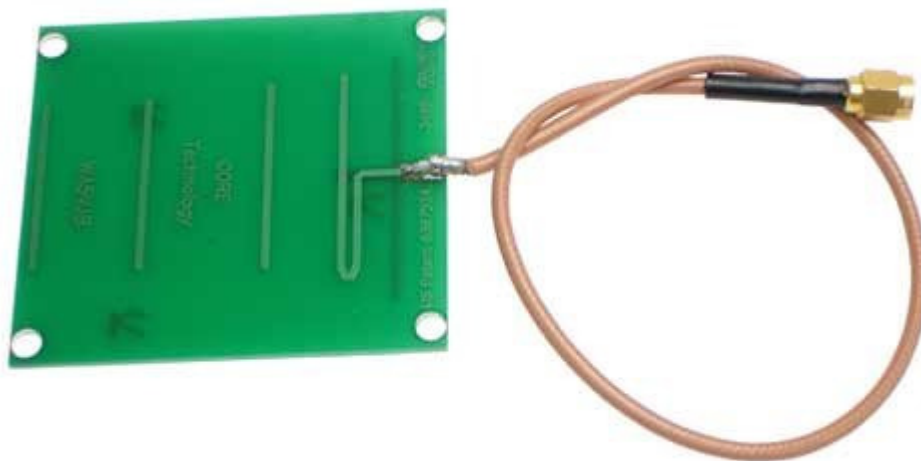


# Ham Hum

July 2015



The official newsletter of  
The Hamilton Amateur Radio Club (Inc.)  
Branch 12 of NZART - ZL1UX  
Active in Hamilton since 1923



**Next Meeting 15<sup>th</sup> July : 19:30**

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**NZART Examiners:** ZL1IC, ZL1PK & ZL1TJA

## From the Editor

Not much to mention this month. I think everyone is still recovering from Conference. Or suffering from the cold :)

I've just become editor of the Br81 magazine, so you may see some things shared between Ham Hum and "The World Below 400 GHz". An example is the last article in this issue of Ham Hum.

I've been looking at the various different aerials in laptop computers for WiFi (2.4 GHz). There are all sorts of different shapes with interesting variations on how the coax (0.8mm OD) is attached. So, when I found the picture on the front cover of a directional Yagi implemented on PCB for 2.4 GHz. See the back cover for where you can buy one of these.

I'll leave you with an image I received from ZL1TAT. In some ways it speaks to the problem of people trusting their GPS (Sat Nav) too much. Although this solution does seem like overkill -



**Next Committee Meetings -  
1<sup>st</sup> July and 5<sup>th</sup> August**

## The K7RA Solar Update

Conditions over Field Day weekend turned out to be not bad at all. The expected geomagnetic upset never happened. On June 25-26, the Thursday and Friday before Field Day, the predicted planetary A index for the June 27-28 was 45 and 60, really bad conditions. The actual planetary A index on those dates was 9 and 13, and the mid-latitude A index was 8 and 12, nice moderate numbers.

Average solar flux over June 25 through July 1 was 100.7, down from 130.8 over the previous seven days. Average daily sunspot numbers declined from 71.6 to 35.9.

There were no new sunspots on June 17-21, one new spot on June 22, none on June 23-27, two new sunspots on June 28, a new sunspot on June 29 and again on June 30, and two new sunspots on July 2. On July 1 there were 3 numbered sunspot groups and 5 on July 2. NOAA/USAF predicts geomagnetic activity at quiet levels on July 3, quiet to unsettled July 4 and unsettled to minor storm levels on July 5.

The latest solar flux prediction has 115 on July 3-5, 120 on July 6-9, 125 on July 10, 130 on July 11-19, then 115, 110 and 105 on July 20-22, 100 on July 23-26, 105 on July 27 through August 1, then flux values rise to 130 after August 6.

Planetary A index is predicted at 5, 8, 25, 15, and 8 on July 3-7, then 5 on July 8-10, then 18, 12 and 8 on July 11-13, then 5 on July 14-17, 8 on July 18-19, 5 on July 20-25, 8 on July 26, 5 on July 27 through August 1, then 18, 15 and 12 on August 2-4 and 8 on August 5-6.

Franz Janda, OK1HH, predicts the geomagnetic field will be quiet to unsettled July 3-4, active to disturbed July 5, quiet to active July 6, quiet to unsettled July 7, mostly quiet July 8-10, quiet to active July 11-12, quiet to unsettled July 13-14, quiet on July 15, mostly quiet July 16-17, quiet to unsettled July 18, quiet to active July 19, quiet to unsettled July 20-21, quiet July 22-23, and mostly quiet July 24-25. Franz expects increases in solar wind on July 5-6, July 10-12 and July 20-25.

Dave Olean, K1WHS, of Lebanon, Maine wrote "I missed the big aurora in the early evening on Monday night June 23rd. I knew it was happening, but had company and could not break away. I finally did get away just about 0100 UT and there was six meter Es and shortly afterwards, I started hearing auroral buzz on several stations."

Later he wrote, "I worked all sorts of 50 MHz aurora out into the far Midwest on

June 22-23 aurora. In between the auroral buzz, I could also work several stations via 50 MHz auroral E out to the Seattle area with K7EK in CM97.

"I also worked VE5UF and VE6EME via auroral Es. It was interesting to look at the signals on my panadaptor. You could pick out the auroral Es signals from the plain auroral signals by their width on the screen! Later on, around 0500z, I tried really hard to work two KL7s, but alas, they could not hear me. I definitely heard them very weakly and with an auroral Es note, but I guess the path geometry was less than optimum. They could not pull me out. The W7 and VE auroral Es was 5x9!

"One interesting contact on 50 MHz was an auroral sounding QSO with N5DG near Houston, Texas. I have never worked that far via the buzz route. Ed, N5DG, said he also copied me with a raspy auroral note as well. Just before midnight, signals started to appear on 144 MHz. I had missed the earlier session, so was anxious to see if the aurora would come back later. It did, and I worked a few stations on 144 MHz for about half an hour. I had to retrain myself in auroral techniques as it has been a long time for me since there was a good aurora on 144. My quad Yagi array was too sharp, and I was constantly turning the beam to peak signals.

"I worked N4QWZ in Tennessee with 59+ signals. He was barely audible when I first heard him with my beam at 320 degrees. K1HTV in FM18 was worked early on with weak signals too at 0355Z, but later I peaked him up to 59+ by turning the beam more to the west. Some of my beam headings were as far south as 285 degrees! That is almost due west! I also worked several stations out in the Chicago area and Wisconsin, but I am afraid that the activity level was low due to it being a late week night. Chicago peaked at 308 degrees.

"After 144 MHz died around 0430, I went back to 50 MHz looking for more Auroral Es. The KL7s were heard after 0500Z. I hung around until 0700 looking for more DX to KL7, but nothing materialized."

Check out the pictures on Dave's listing at QRZ.com, especially his stack of antennas.

Rich Zwirko, of Amissville, Virginia (who K1WHS mentioned) reports: "June 29, the day after the ARRL Field Day, produced some interesting Es openings on 50 MHz. The day started with UT1FG/MM pounding into my FM18ap QTH from water grid FM92. He was in the K1HTV log at 1250Z. Less than 10 minutes later I worked Yuri again as he passed into another new grid, GM02. Six-meter-regular CT1HZE was worked at 1848Z, followed by C6AUX and CN8KD a few minutes later. UT1FG/MM was worked in yet another new grid, GM03, at 1913Z. At 2007Z

I worked EA9IB in IM85, not having worked Pedro on 6 meters for over 15 years. Back in 1993 the K1HTV contact with EH9IB (the call he was assigned back then) was the first ever USA to EA9 QSO on record on 50 MHz.

“As June 29 progressed, at 2116Z UT1FG/MM was worked again, now in grid GM13, the 4th new grid for me today on the Magic Band. In the last hour of the UTC day other DX stations worked included PJ5A, J69MD, VP2ETE and J69DS.

“UTC June 30 started off with a bang. With the MUF over 150 MHz just SW of my FM18ap QTH, 2 meter stations northeast of me in W1, W2 and W3 land were working into a number of southern states. A cloud over northeast Tennessee produced enough ionization for my only 144 MHz Es QSO when I worked WA4ZZW in EM64 in Alabama.”

David Moore sent this link, to a piece about a spectral slicing satellite revealing the anatomy of a solar flare: <https://shar.es/1qwz6G>

Jon Jones, N0JK, wrote: “I worked C6AUX at 1509z and PJ5A at 1921z on 50 MHz June 28 from the Kansas City Veterans Administration Parking lot. This was via sporadic E. C6AUX was loud at times, PJ5A not as strong.”

Jon says he works at the VA hospital part time in the Emergency Department, and when he wasn't busy on Sunday he took some time to get on 6 meters. The area he operated from has a clear shot to the Southeast across the Blue River Valley. He pressed a 5/8 wave 2 meter antenna into 50 MHz service, where it operates as a 1/4 wave vertical. You can see a picture at <http://bit.ly/1C64dbx>. (This link does not work for me with *Internet Explorer*, but only *Firefox* for some reason.)

Jon also wrote, “KI0I also worked C6AUX while mobile June 28 from EM28 on 6. He used a homemade J-Pole fishing rod antenna on his truck. He also logged 6Y5WJ.”

On July 2 Jon wrote, “June 30 and July 1 - JW7QIA Svalbard made numerous contacts on 6 meters to North America. He worked C6AUX for the first Bahamas to Svalbard 50 MHz contact.

“Svalbard is near the North Pole and not in the mid-latitude Es zone. What is the propagation mechanism to North America? Perhaps Aurora Es on to mid-latitude sporadic Es.”

**This just in:** The World Data Center Sunspot Index and Long Term Solar Observations from the Royal University of Belgium has finally transitioned to a new International Sunspot Number system, and has completed extensive revisions to the sunspot record, going back centuries.

You can read about it here:

<http://www.sidc.be/>

<http://www.sidc.be/silso/taxonomy/term/1>

<http://www.sidc.be/silso/news008>

The numbers used in this bulletin are the Boulder sunspot numbers, and will not be affected.

And finally, at the end of June it is time to look at our 3-month moving average of daily (Boulder) sunspot numbers. The latest data is centered on May 2015, and includes all daily sunspot numbers from April 1 through June 30. The numbers for January through May 2015 are 98.2, 78.1, 68.2, 72.4 and 77.7. The cycle peaked during the periods centered on February and March 2014 when the moving averages were 146.4 and 148.2. The data centered on February 2014 included all daily sunspot numbers from January 1 through March 31. The average centered on March 2014 included all daily sunspot numbers from February 1 through April 30. This shifting 3-month average smoothes the numbers, making it easier to identify shifts in the solar cycle.

For more information concerning radio propagation, see the ARRL Technical Information Service at <http://arri.org/propagation-of-rf-signals>. For an explanation of the numbers used in this bulletin, see <http://arri.org/the-sun-the-earth-the-ionosphere>. An archive of past propagation bulletins is at <http://arri.org/w1aw-bulletins-archive-propagation>. More good information and tutorials on propagation are at <http://k9la.us/>.

Archives of the NOAA/USAF daily 45 day forecast for solar flux and planetary A index are in downloadable spreadsheet format at <http://bit.ly/1IBXtnG> and <http://bit.ly/1KQGbRm>.

Click on "Download this file" to download the archive and ignore the security warning about file format. Pop-up blockers may suppress download. I've had better luck with *Firefox* than *Internet Explorer*.

Monthly propagation charts between four USA regions and twelve overseas locations are at <http://arri.org/propagation>.

Instructions for starting or ending email distribution of ARRL bulletins are at <http://arri.org/bulletins>.

Sunspot numbers for June 25 through July 1 were 33, 28, 25, 39, 36, 41, and 49, with a mean of 35.9. 10.7 cm flux was 101.8, 101.2, 97.3, 97.3, 97.1, 100.8, and 109.6, with a mean of 100.7. Estimated planetary A indices were 33, 10, 9, 13, 6, 6, and 5, with a mean of 11.7. Estimated mid-latitude A indices were 19, 9, 8, 12, 6, 8, and 6, with a mean of 9.7.

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## **Your first antenna – the half-wave dipole**

Many hams' first choice of antenna is a half-wave dipole. But don't be misled – just because they are easy to make doesn't mean they don't work well. In fact, a half-wave dipole will often outperform many compromise commercial multiband antennas.

Half-wave dipoles are easy to install and erect and are not nearly as likely as end-fed wires to give rise to EMC/interference problems.

As the name suggests, a dipole has two 'poles' or sections to the radiating element. In its most common form it is a half-wavelength long at the frequency of operation.

This is its fundamental resonance, and from looking at the voltage and current waveforms (Fig 1) it can be seen that the voltage is at a minimum at the centre with the current at a maximum.

By feeding the antenna at this point it provides a low impedance feed and a good match to your coax. Normally 50 ohm coax, such as RG213 or RG58 is used as this provides a reasonable match.

The dipole when mounted horizontally radiates most of its power at right angles to the axis of the wire.

In this way it may be possible to angle the antenna to 'fire' in the direction where most contacts are wanted, although the dimensions of your garden are more likely to determine what is possible.

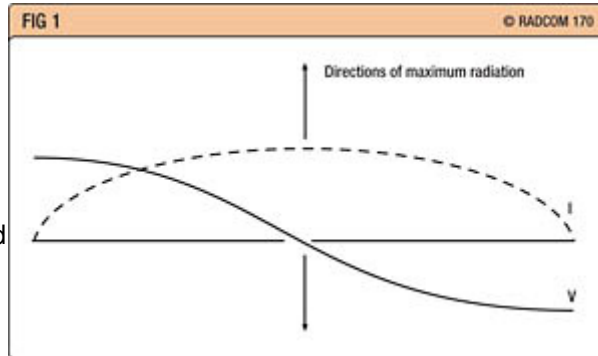
It is also possible to operate the antenna at a frequency where its length is three half-wavelengths, or any odd multiple of half-wavelengths long.

This enables a dipole to be used on more than one band of frequencies. For example a half-wave dipole cut for operation on 40 metres (7MHz) will also operate as a three half-wavelength dipole on 15 metres (21MHz), although the SWR will be slightly higher.



Half-wave dipoles used on anything other than their fundamental frequency of operation, or any odd multiple of this, will work, but you will need to use an ATU. A dipole used like this is unlikely to be very efficient and this type of operation should be avoided.

{Continued at <http://rsgb.org/main/get-started-in-amateur-radio/antennas/your-first-antenna-the-half-wave-dipole/> }



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## A well-known voice in the Amateur Radio news media has gone silent.

Bill Pasternak, WA6ITF, of Santa Clarita, California, died June 11 following a period of ill health. He was 73.

A well-known voice in the Amateur Radio news media has gone silent. Bill Pasternak, WA6ITF, of Santa Clarita, California, died June 11 following a period of ill health. He was 73. Pasternak was co-founder (with Jim Hendershot, WA6VQP) of Amateur Radio Newsline(tm) (formerly The Westlink Report) ham radio news webcast and a frequent presence at Amateur Radio conventions. Pasternak served as Newsline's managing editor and occasional newscaster for the program. Even while hospitalized earlier this year, he kept his ear to the ground for news from the Amateur Radio community, so he could pass it along to those who had taken over Newsline during his illness - discovered after he broke two ribs in a fall. ARRL Rocky Mountain Division Director Brian Mileschosky, N5ZGT, got acquainted with Pasternak at the Albuquerque hamfest and in 1997 was named Newsline's "Young Ham of the Year" (YHOTY).

"An incredible man, ham, and one of Amateur Radio's too-few giants, who woke up every day to make the hobby better for everyone, especially its legacy - youth," Mileschosky said. "I've enjoyed the energy he put into keeping hams informed via Newsline, and have been honored to give back to his Newsline Young Ham of the Year Award program, since being asked by him to sit on its judging panel well over a decade ago."

ARRL Public Relations Committee Chair Katie Allen, WY7YL, said Pasternak

would be missed by those within and outside the Amateur Radio community. "He truly was one of the good ones," she remarked on Pasternak's Facebook page. "Thank you for sharing your light with us, Bill."

A Brooklyn, New York, native, Pasternak became a radio amateur in 1959 as WA2HVK and once was very active on 6 meters. "I love the hands-on approach to ham radio and built my very first transmitter using parts salvaged from an old Dumont television set," Pasternak recounted in an online biography. "It was a modification of a design by Bill Orr, W6SAI, published in his famous Novice and Technician Handbook. A crystal-controlled, low-power 6 meter AM transmitter that doubled in the final, was screen grid modulated, and put out almost no output power."

He eventually got into broadcasting and made his career in television engineering and production. He retired as a broadcast engineer with KTTV in Los Angeles in 2012 but continued as a broadcasting consultant.

Pasternak was the spark plug behind the all-volunteer Amateur Radio Newline bulletin - which was relayed on repeaters around the US and elsewhere - as well as the creator and administrator of the annual YHOTY. He was the author of three books and served as a writer/producer on several educational films and videos, including the award-winning "Amateur Radio Today." In earlier years, he wrote the "Looking West" column for 73 Amateur Radio Today Magazine for 26 years and penned a "VHF, FM and Repeater" column for WorldRadio. He also contributed to broadcast trade publications as well as to CQ.

In addition to the ARRL, Pasternak belonged to the Radio Club of America and the Quarter Century Wireless Association. He also enjoyed flying, including stunts getting on the air from thousands of feet up.

He was the only person ever chosen to receive the Dayton Hamvention Special Achievement Award (1981) and Radio Amateur of the Year Award (1989). In 1995, the League presented him with an ARRL National Certificate of Merit in recognition of his contributions to the "furtherance of the goals of the Amateur Radio Service."

Survivors include his wife of 43 years, Sharon, KD6EPW.

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## **MDT DSB Transceiver**

The MDT (Minimalist Double Sideband Transceiver) is an inexpensive and easy to build kit for the 40M band. It is ideal for the first time builder as all parts except the microphone socket are mounted on a single PCB and all the components are through hole.



***This is a full kit containing everything you need even the case and specially pre-cut and printed front and rear panels.***

Price is AUD\$75 from ozQRP ([www.ozqrp.com](http://www.ozqrp.com))

**Features:**

1. Size 130mm x 100mm x 50mm.
2. Sensitive Direct Conversion receiver.
3. Up to 2W PEP power output.
4. Frequency range 7.090MHz - 7.130MHz or 7.050MHz - 7.110MHz.
5. Microphone amplifier accepts standard low impedance dynamic or Electret microphone with selectable on-board bias resistor.
6. LED transmit power and modulation indicator.
7. 3.5mm stereo headphone connector. Can power external loudspeaker.

8. Carrier suppression up to 50dB.
9. All spurious transmit outputs better than -46dBC.
10. Receive current approximately 50mA.
11. Transmit current approximately 250mA at maximum power output.
12. Reverse polarity protection using a series-diode.

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## **Three Important Things to Consider Before Building a Ham Radio or CB Antenna**

*{ This is a perfect article for new Hams looking to get an antenna in the air, or experienced Hams wanting a back to basics refresher course, and anything in between.—Editor }*

Building communications antennas can be fun and exciting especially for the new antenna builder that is eager to get started. But no matter what type of antenna you are building there are some important things to consider before getting started. Here are a few tips to help put you on the path to success with your antenna projects.

### **Number One: Purpose**

The first consideration is, "How do you plan to use your antenna?" Before building any communications antenna you need to know what purpose the antenna is intended to be used for. There are different applications for the use of antennas. Some antennas are for short range communications while other antennas are specifically designed for long range or satellite communications.

Vertical antennas, such as mobile antennas and base station ground plane antennas, are basically for short range communications. When such an antenna is mounted in a vertical position we refer to it as being vertically polarized. A vertical antenna, or a vertically polarized antenna, sends its signal out along the earth's surface. This type of radio wave propagation is called, "ground wave." Although mostly for base to mobile communications a vertical antenna is also capable of working long distance communications. A ground plane antenna has a low angle of take off and sends its signal out towards the horizon before bouncing off the ionosphere. A vertical antenna elevated on a mast will produce both a low and high angle of take off which in a way also increases gain.

Horizontal antennas such as dipoles, inverted V antennas and other horizontally polarized antennas are for working "sky wave" propagation. These antennas are for receiving signals that are coming down from the ionosphere and for transmitting signals back into the ionosphere. Bouncing radio waves off the earth's ionosphere is how we communicate long distances. Charged ions in the ionosphere

and favorable band conditions will allow even a 5 watt transceiver to receive and transmit half way around the globe. Horizontal antennas are not meant for close range communications. So if you build a horizontal dipole or an inverted V antenna for the CB band it will do a great job working stations half way across the country but it will not work very well for local communications.

### **Number Two: Cost**

The next thing to consider is the cost of your antenna project. Some antennas are less expensive to build rather than purchase but in some cases it is less expensive to buy the kit! Antennas made of PVC pipe and wire cost very little to make while antennas made of aluminum tubing become much more expensive to construct.

In some cases it is less expensive to buy an antenna rather than buy all the parts to build it yourself. A small HF 3 element yagi antenna is often less expensive purchased as a kit than it is to buy all the parts separately. If you need to buy all new parts for a CB antenna then even a nicer vertical dipole made of aluminum tubing and mounted on a boom may cost more to make than a ready-to-install fiberglass half-wave antenna that performs about the same.

On the other hand, many of us do enjoy building our own antennas and so some of us would not mind paying a little extra for the pleasure of building it ourselves. The cost is really up to you.

### **Number Three: Resources**

Now consider your resources. What do you have on hand to use for materials and how are you going to install the antenna? Resources are what materials you have on hand to work with and the space, area or way to mount the antenna. The type of antenna that you build may be limited by the way that you intend to mount your antenna. Not everyone has a lot of space to work with and often times space and height is the problem especially when it comes to larger HF antennas.

Vertical antennas can be mounted on a mast or mounted on the ground. For transmitting and receiving signals by means of ground wave propagation and "line of sight" vertical antennas are best mounted as high as possible on a mast or tower. HF vertical antennas mounted on the ground perform better as a long distance antenna.

Horizontal antennas such as horizontal dipole antennas require height in order to properly radiate a signal. These types of antennas will not work correctly if mounted too close to the ground. The required height depends on the wave length. Horizontally polarized antennas made for higher VHF/UHF frequencies do not require as much height as do larger HF antennas.

-KG0ZZ

## Upcoming Happenings & Events

<i>Date</i>	<i>Happenings &amp; Events</i>
<b>3rd July</b>	<b>NZART HQ-Infoline</b>
<b>4-5 July</b>	<b>NZART Memorial Contest</b>
6th July	HF Net, 3.575 MHz, 19:30
7th July	VHF Net, 146.525 MHz, 20:00
13th July	HF Net, 3.575 MHz, 19:30
14th July	VHF Net, 146.525 MHz, 20:00
<b>15th July</b>	<b>Club General Meeting</b>
<b>17th July</b>	<b>NZART HQ-Infoline</b>
20th July	HF Net, 3.575 MHz, 19:30
21st July	VHF Net, 146.525 MHz, 20:00
<b>26th July</b>	<b>NZART Official Broadcast</b>
27th July	HF Net, 3.575 MHz, 19:30
28th July	VHF Net, 146.525 MHz, 20:00

**1-2 August—NZART Brass Monkey Contest**  
**7th August—NZART HQ-Infoline**  
**8th August—Hamilton Market Day**  
**21st August—NZART HQ-Infoline**  
**30th August—NZART Official Broadcast**  
**3-4 October—NZART Microwave Contest**  
**5-6 December—NZART Field Day Contest**  
**6-7 February 2016—NZART DX Weekend Contest**  
**27-28 February 2016—NZART Jock White Memorial Field Days Contest**  
**2-3 April 2016—NZART Low Band Contest**  
**21-22 May 2016—NZART Sangster Shield Contest**  
**4-5 June 2016—NZART Hibernation Contest**  
**2-3 July 2016—NZART Memorial Contest**

For more information on any of the above please contact myself or any committee member.

### Club Information



#### **Contacts :-**

**Business Meeting:** 1930 First Wednesday of each month except January  
88 Seddon Road, Hamilton

**General Meeting:** 1930 Third Wednesday of each month (except Jan)  
88 Seddon Road, Hamilton

**Homepage:** <http://www.z1ux.org.nz>  
**eMail:** [branch.12@nzart.org.nz](mailto:branch.12@nzart.org.nz)

**HF Net:** 3.575MHz LSB 1930 Mondays  
**VHF Net:** 146.525MHz simplex 2000 Tuesdays

**2m Repeater:** 145.325MHz -600kHz split  
**STSP** 146.675MHz -600kHz split  
**Repeaters:** 438.725MHz -5 MHz split  
**ATV Repeater:** Off air pending channel changes

*Cover Photo:* <http://www.amazon.com/Directional-Antenna-8-5dBi-Forward-Assembled/dp/B000FMNZ8W/>

Sender	Hamilton Amateur Radio Club (Inc) PO Box 606 Hamilton 3240
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