

Ham Hum

March 2015



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



Next Meeting 18th March : 19:30

Murray Greenman : FSQ (new HF Digital chat mode).

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From the Editor

Latest about the NZART Conference is that accommodation may disappear quickly, so I'm repeating the message below

As I mentioned last month, accommodation can be tight over Queen's Birthday weekend. So I draw your attention to a list of accommodation options that the Conference Committee has gathered together at : http://z1ux.org.nz/conference_accommodation.html

The official registration form is now available at http://z1ux.org.nz/NZART_Conference_2015_Reg_Form.pdf Early registration, with discounted fee, closed on 15th May.

On the cover of last months issue of Ham Hum you will have noticed a strange group of people standing with a "Hamilton Amateur Radio Club" sign. It seems we have a sister club in Hamilton, Ontario, Canada that shares our club name. Recently we started sharing newsletters. They have an IRLP node at 2313 and would be keen to hear from our club members.

**Next Committee Meetings -
4th March and 1st April**

SB PROP ARL ARLP009 ARLP009 Propagation de K7RA

Average daily sunspot numbers over the past week were about the same (59) as last week (54.6), and average daily solar flux declined, from 121.4 to 116.3.

Average daily planetary A index increased from 9 to 11.3, and average daily mid-latitude A index also was higher, from 7 to 9.3.

These numbers compare the seven day period from February 19 to 25 with the previous seven days.

The latest NOAA/USAF solar flux forecast shows solar flux at 110 on February 27 through March 1, 105 on March 2 to 4, then 115 and 130 on March 5 and 6, 135 on March 7 to 9, 130 on March 10, 125 on March 11 and 12, 120 on March 13 to 17, and 115 on March 18 to 23. Solar flux then reaches a peak of 135 on April 3 to 5 before declining again.

Predicted planetary A index is 8, 20, 22 and 15 on February 27 through March 2, 8 on March 3 to 6, 10 on March 7 and 8, 5 on March 9 to 13, then 10 and 5 on March 14 and 15, 15 on March 16 and 17, 8 on March 18, 5 on March 19 to 21, 10 on March 2 and 8 on March 23 to 25.

Petr Kolman, OK1MGW believes geomagnetic conditions will be quiet to unsettled February 27, active to disturbed February 28, disturbed on March 1, active to disturbed March 2, quiet to unsettled March 3 and 4, mostly quiet March 5, quiet on March 6, mostly quiet March 7, quiet to active March 8, quiet to unsettled March 9, quiet to active March 10, quiet on March 11 to 13, mostly quiet March 14, quiet to unsettled March 15, quiet to active March 16 to 18, mostly quiet March 19 and 20, quiet to unsettled March 21, quiet to active March 22, active to disturbed March 23, quiet to unsettled March 24, and mostly quiet March 25.

Petr believes increases in solar wind are mostly unpredictable, but some peaks are expected around February 28, March 1, 8, 16 and 17, and 22 and 23.

At 0513 UTC on February 27 the Australian Space Forecast Centre issued a revised geomagnetic disturbance warning. An earlier warning said the predicted disturbance was due to a coronal mass ejection, but the cause was revised to a strong solar wind stream. They believe geomagnetic activity may rise to minor storm levels on February 28 and March 1.

Tom Frenaye, K1KI sent a couple of links referencing the Reverse Beacon Network as crowdsourcing for detecting solar disturbances to the ionosphere.

See:

<http://onlinelibrary.wiley.com/doi/10.1002/swe.v12.12/issuetoc>

<https://eos.org/research-spotlights/radio-blackout-ham-radio-operational-scientific-instrument>

Max White, M0VNG forward an article about the sun from phys.org:

<http://phys.org/news/2015-02-magnetic-field-sun.html>

Buzz Kutcher, K3GWK in Jenkinsburg, Georgia (EM73xh) on February 15 at 1836 UTC worked S01WS in Western Sahara on 10 meters FM. This was his first contact on 10 FM, and it was full quieting, sounding the same as when he works his close neighbor on FM simplex.

Shel Darack, WA2UBK of Livingston, New Jersey wrote:

"Band conditions were very good for me using 100W into a sloping dipole on 40m Saturday night and tri-band antenna on 10 and 15 during Sunday for the ARRL CW DX Contest.

During the last hour of the contest, JA's were strong and easy to work on 15 meters using 100W and a small tri-band antenna at my New Jersey QTH.

Later, after the contest and well past sunset I noticed SSB signals that I could not quite tune in for clarity and thought maybe it was LSB.

I discovered I was hearing one side of a JA QSO in Japanese. With my antenna pointed nearly north toward Japan, I continued to listen for a while and soon a W0 came on exactly on frequency asking if the frequency was in use. He asked again and after no response called CQ. A W7 replied. The W0 commented that there was no activity on the band. I could hear both US stations and the JA. After a while propagation to the US stations faded out but I could hear the JA by then working a pile up of US stations."

Jeff Hartley, N8II of Shepherdstown, West Virginia (FM19cj) wrote, "The solar flux has dropped into the danger zone for good 10 meter conditions to EU. During the ARRL CW DX contest it was just below 120 and the band was slow to open to EU on Saturday. I checked 10 at 1330Z and of the 4 EU I worked then, only an IT9 was louder direct path, the rest were peaking around 140 degrees over eastern SA. I returned to find a mix of weak and strong direct path EU at 1452Z almost 3 hours past my sunrise, but the band never really opened to the Baltic states and Scandinavia.

Most of my QSO's were more southerly central and western EU and the run ran dry at 1727Z, so I went back to 15. Both days prop to the Caribbean seemed marginal along with very northern SA, farther south was OK. The majority of JA's were worked right at the start Friday evening with the big guns having S 7-9 signals. I found DU3 who is exactly the same heading as JA and RT0F also same heading of 330. KH6 was pretty loud then and for both afternoons into evening

along with ZL, but no VK's were heard. Sunday into EU at 1322Z was much like a high SFI opening with good signals even from Russia and Scandinavia. I was called by Saudi Arabia, UN7, and two VU's all having strong signals. I ended up with 845 QSO's in 78 countries.

Fifteen meters was the best overall band for me with 933 QSO's in 100 countries. One of the PVRC skilled ops, K3RV, locally made over 1900 QSO's in over 120 countries. Both days conditions were excellent to East Asia with many loud JA's and EU, and also good openings also into central Asia. In the first hour a JW called me and I logged big gun stations from OH and SM as well, not bad for 2-3 AM at their QTH. There must have been some auroral sporadic E. Also logged were Hong Kong, China, and several loud Hawaiians.

Signals from EU were quite loud by 1153Z Saturday and the big guns from about HA westward were in both days past 2130Z when the majority of EU ops were on 20 by 2000Z. EU signals were the loudest of any band from all over on 15 and AF was loud until 2200Z.

Propagation on 20 was good to everywhere at some time of the contest. At 0100Z about half of EU was pretty loud from DL, OK, and HA farther south and west and all of northern EU. AF was loud (D4, CN, EA8, EA9, CR3, Z8 Southern Sudan and ZR9 South Africa) as well as everyone to the south, all of Siberia, and KH6 as well. It was a lot of DX fun and rotator workout. EU was loud either side of my sunrise and again from about 1830-2130Z. On Sunday through a drone of EU callers, I heard JA's, BG2 and E20 (Thailand) louder than EU and also was called by RI1ANZ from Antarctica long path. The morning 20M Antarctica LP is open frequently, but not utilized that often. Clearing 7 inches of snow that fell Saturday cost me quite a few EU QSO's Sunday afternoon.

40 was about as good as it gets with strong EU signals from central and south EU throughout the evening, although not as strong around sunset. I logged a few Asians including 7Z in Saudi Arabia, a few AF, and DP1POL in Antarctica. JA's were weak to me, but my antenna is only a sloping dipole to JA, logged about 4 along with ZL.

80 was in decent shape to EU especially to UR and UA6 with many of them logged. OH0 and two JA's were logged as well as loud sunrise KH6. I had a nice run of about 80 mostly EU stations the first night around 0400Z. I found KL7 around sunrise Sunday and we moved down to 160 successfully also! I finished with 156 QSO's in 39 countries in limited time there.

My 160 meter score was probably my best ever in ARRL DX with 41 QSO's in 30 countries largely thanks to finding very good EU conditions at 0300Z the first night. I worked as far east as RW7 and UR and did get a few EU to answer CQ's. There was no EU sunrise peak here like they were getting in New England; signals were much weaker than 0300Z. The second night was poor to EU, but I did manage 2

brand new 160 countries, TI9 and LU. The LU8 had a very good signal, but could barely copy me through his summer QRN. I also logged Ecuador."

KD2BD, John Magliacane of Sea Girt, New Jersey emailed a blast from the past, some old email (from me), ARRL bulletins, and various posts from the late 1980s and early 1990s on Usenet and the amateur packet radio network, which he recovered from archives on an old hard drive.

I hope to post some newly recovered ARRL Propagation Bulletins from 1990-1991 at <http://arrl.org/w1aw-bulletins-archive-propagation>. If you find any old archives such as this, please contact me at k7ra@arrl.net.

If you would like to make a comment or have a tip for our readers, email the author at, k7ra@arrl.net.

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

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

Sunspot numbers for February 19 through 25 were 86, 53, 54, 49, 44, 63, and 64, with a mean of 59. 10.7 cm flux was 118.7, 119.7, 116.1, 117.5, 116.8, 114.4, and 111, with a mean of 116.3. Estimated planetary A indices were 8, 6, 7, 7, 17, 25, and 9, with a mean of 11.3. Estimated mid- latitude A indices were 5, 4, 8, 6, 14, 21, and 7, with a mean of 9.3.



A De-Soldering Primer By Wayne Burdick, N6KR

Removing resistors and other parts from double-sided boards is easy and fun. After years of careful analysis of my own technique I have documented the process. I start with technique #1, below; if that doesn't work, I try #2, etc. Good luck!

1. Turn the board over. With one hand behind your back, a wry smile, and the confidence of a pet surgeon, simply heat the lead in question and listen for the pleasant sound of the component hitting the work bench.

2. Well, that *would* be too easy, wouldn't it. Staying with the solder side for now, locate a large solder sucker (the larger the better; it should frighten smaller pets

when brandished). Heat each joint and deftly suck out the solder with a single satisfying Thwop! Listen for the part hitting the bench.

3. Didn't fall out, eh? No problem: rummage in that tool bin for a shiny new roll of solder wick. Crack open a beer, too, and take a generous swig. Wedge that wick in between the lead and pad, heat until you see the solder flow nicely onto the wick, and pull it out of the way just in time to see a beautiful, black annular ring around your component lead. Nudge each lead with your iron and keep your fingers crossed.

4. OK, so you've got a tough customer: small lead, hole just barely larger, and a bit of off-color solder that can't be bothered with any of the usual techniques. Have another sip of that brew. Vigorously flip the board back to the component side. Now grip the lead professionally with your most elegant long-nose pliers and hold on tight. Give it a playful yank, then pray. Should pop right out.

5. Damn. Finish the beer and get out your brutal, 8" electrician's long-nose. Grab the component with gusto this time, buster, then tip the board up at a 45. Turn up your soldering station to max and heat that baby up on the backside. Pull down hard with the pliers.

6. No go? Hmmmm -- let's get serious. Put the board up directly on its edge and hold it in place vertically with your chin. Since your iron is suspect by this time, test it for several seconds on the nearest exposed skin. (Doing it by accident is just as effective.) Heat the joint with *feeling* this time. Lunge and parry. Don't worry about the pad, traces, or other parts--this is war! With maximal chin pressure exerted to hold the offending board in place, pull the lead out, out, Out!

7. OK, so you "...couldn't get hold of it...", blah blah blah. Fool! You must risk everything at this stage. Insert a small screwdriver under the part, and white-knuckle that soldering iron on the obverse. Pry and heat until it pops. (Note: It is important to keep in mind the concept of "kick-back" should you succeed at this. PC boards are likely to wobble, flop, slip, then fling out of your grasp once the offending little monster finally lets go, taking test leads and soldering station with it.)

8. So, what kind of inept dweeb are you, anyway? Give up! Clip the part. Leave some lead to grab onto and repeat #6 and 7. If your face has turned red it is best to shield the work from view with your body, then steal a quick look behind you to be sure noone is suppressing a giggle as they watch this humiliating display.

9A. The lead came out but you STILL have some solder left in the hole? Gads. Find another part that you can sacrifice. Press its helpless lead into the depressingly small pit you made in the center of the pad. Heat the base of the lead until you achieve Punch-Through. Yank and Heat, Yank and Heat. Eventually the solder will give up in disgust and the sacrificial component lead will slide smoothly, signaling victory.

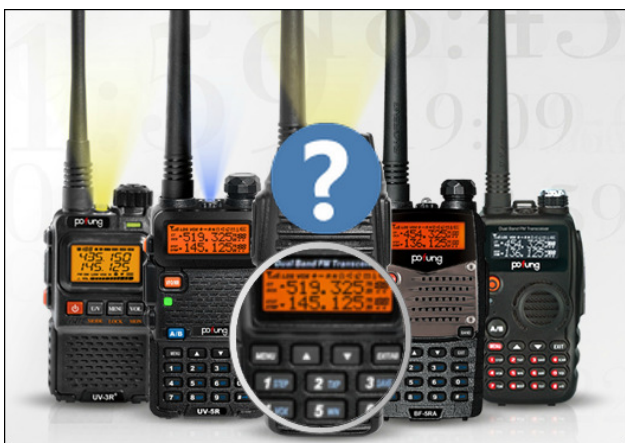
9B. To your left is a hand drill; to your right is a #60 bit. You know what you must do.

10. Now—you brute!— now that you've overheated the pad, broken the trace, cracked the component, gouged the board, pitted the tip, blistered the skin, wasted a beer, and irrefutably proven once and for all that you should have taken up gardening instead, NOW maybe you'll learn the color code!



What's the difference between the Baofeng UV-3R, UV-5R, UV-82, UV-B5/UV-B6, etc.?

In China, there is a lot of passing around of designs, tweaking, improving upon, and re-branding.



In 2011 a company called VeroTelecom brought out a “UV-3R” radio which was picked up on by Baofeng and brought to a Western market where, eager for a bargain, it went down a storm. A year later, TYT made the TH-UV5R which again was picked up by BF and released in the West as the UV-5R. Initially meant as cheap SDR business band HTs, hams quickly noticed that they have a

proper VFO making them perfect for our uses.

A year after that, Baofeng (now Pofung, internationally) designed and released their own radios based on the UV-5R; the UV-82, a more “professional” version of the UV-5R, and the UV-B5/UV-B6 with an entirely redesigned and far more selective RF front-end.

The first two are pants as radios go, with all kinds of weird bugs, overloading problems, and less-than-adequate phase noise and harmonic suppression performance.

The UV-82 crossed the line from “meh” into “good” with performance being on par with existing radios twice the price.

The UV-B5 blew all existing Baofengs out of the water, with on-air performance nearly matching that of Yaesu's lower end Vertex (VX-**) series handhelds which cost five times the price. It has its quirks but for basic repeater ragchewing its value for money can't be beaten.

The great thing is, all these radios can be had for under \$35 if you know where to look: while not perfect they are a great way to get started, or to dip your toes into the hobby without spending too much. However, if you have the disposable income to put down on a more expensive radio, do – the Yaesu FT-60R is a good start.

If you'd like to read more about the differences between some of these radios, I go into a little more detail [here](#).

[Chris Northcott, 2M0FFY](#), is a special contributor to AmateurRadio.com and writes from Edinburgh, Scotland.

\$50SAT update

The amateur radio PocketQube **\$50SAT/MO-76** - in orbit for 15 months, 15 orbits per day, and some unexpected behavior

Saturday, February 21, 2015 marked the 15 month anniversary of the launch of \$50SAT/MO-76, and you guessed it – it is still operating.

Thursday, February 12, 2015 marked a different milestone – its orbit has decayed to the point where its mean motion crossed the 15 orbits per day threshold. The TLEs from Saturday, February 21, 2015 indicate it is now at 15.00521293 orbits per day.

Some of you noticed that something odd started happening on Monday, February 23, and Tuesday, February 24. We also noticed the same thing – during daytime passes in the northern hemisphere, \$50SAT was transmitting once per minute, always sending telemetry in RTTY format, but never sending GFSK telemetry packets. Moreover, the total reset count kept going up by one each time.

What seems to be happening on the descending (daytime) passes is the CPU is reset just after sending a full RTTY telemetry message, as here are no GFSK packets sent, but within a half minute the FM Morse beacon is heard with Stuart's call-sign (GW7HPW, the first one in the rotation). My guess is the battery voltage is decaying during the operational cycle, and goes below the 2.9V reset threshold just after sending the RTTY or just as it is about to send the GFSK packets. Once the

satellite is able to enable solar power (PCB temperature ≥ 0 degrees C), it starts behaving normally; it is now able to send GFSK packets. During ascending (nighttime) passes, it behaves normally, at least here in EN82 land.

There was a brief time where this behavior stopped (2015-02-25, 17:05 UTC through 2015-02-26, 3:47 UTC). It did, however, start back up sometime before 2015-02-26, 05:21 UTC, and has continued since.



Why is this happening now? We are still investigating, but it is apparent when looking at the chart of battery voltage over the lifetime of \$50SAT/MO-76 that the battery has suffered a sizeable drop in capacity. If the battery voltage under load is dropping below 2.9V, how is it able to recover back above 3.3 V (the minimum required to enable transmission) and nearly complete another operational cycle? Moreover, why does it always seem to be able to finish sending an entire RTTY packet before resetting?

In the hopes of better understanding what is happening, I am in the process of re-assembling my "BoxSat" test setup in an effort to reproduce on the ground what is happening in space. In the meantime, the once-per-minute transmission is actually

convenient from telemetry monitoring standpoint, as one no longer has to wait 3 minutes for \$50SAT/MO-76 to start transmitting. So, for any of you who have not heard \$50SAT/MO-76, now is the time. Who knows how long it will continue to operate in this manner? Who knows how long it will continue to operated at all? Every time an anomaly has occurred and thought, "this is it – well, it was great while it lasted", \$50SAT/MO-76 has proven me wrong. I hope that is the case here as well.

The Dropbox has been updated with all the telemetry observations through today (Wednesday, March 4 2015), and can be accessed via the following URL:

<https://www.dropbox.com/sh/l3919wtfiywk2gf/AABRI4iM5BFqVAclQGSmDsVga/Telemetry-analysis/Current-Telemetry>

I have also uploaded an MP3 file from the daytime pass over EN82 land on Friday, February 27, 2015 starting at 16:59 UTC (11:59 AM local time); it can be accessed via the following URL:

<https://www.dropbox.com/s/2vfbtu51qn63aoa/50USDSat-LSB-FM-2015-02-27T1659Z.mp3>

During the recording, I switch back and forth between FM and LSB modes so I can hear the FM Morse beacon as well as the RTTY telemetry.

Please keep the telemetry observations coming, especially now!

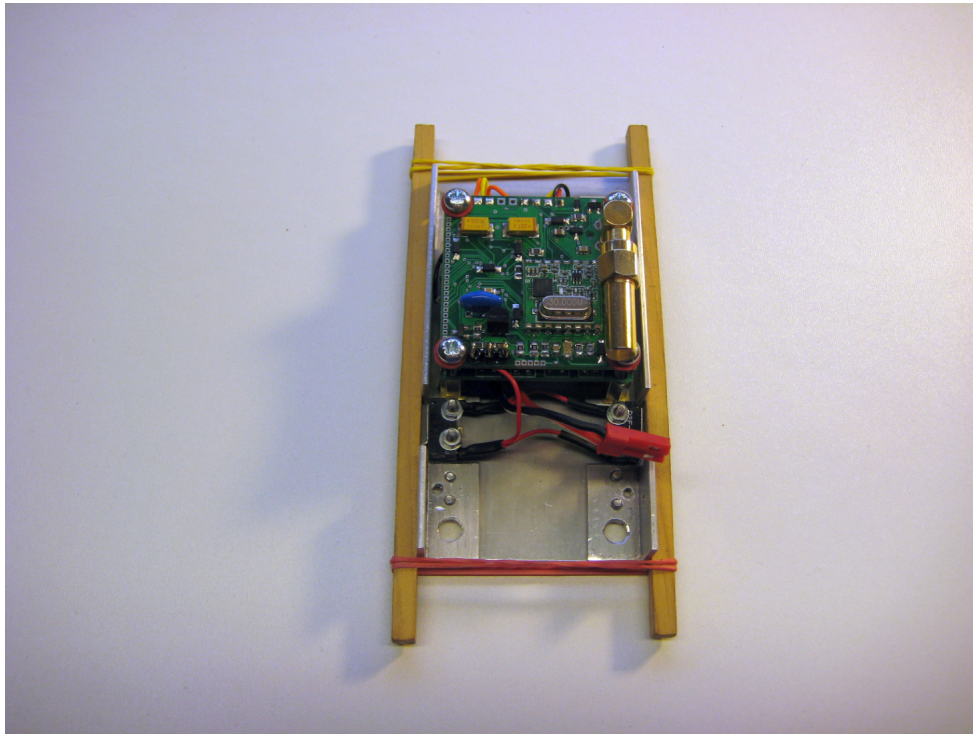
73 Michael Kirkhart KD8QBA

\$50SAT/MO-76 team

\$50SAT was a collaborative education project between Professor Bob Twiggs, KE6QMD, Morehead State University and three other radio amateurs, Howie De-Felice, AB2S, Michael Kirkhart, KD8QBA, and Stuart Robinson, GW7HPW. The transmitter power is just 100 mW on 437.505 MHz (+/-9 kHz Doppler shift) FM CW/RTTY. \$50SAT uses the low cost [Hope RFM22B](#) single chip radio and [PICAXE 40X2](#) processor.

There is a discussion group for \$50SAT
<http://groups.yahoo.com/groups/50dollarsat/>

50DollarSat <http://www.50dollarsat.info/>



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we currently enjoy.*

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Upcoming Happenings & Events

<i>Date</i>	<i>Happenings & Events</i>
2nd March	HF Net, 3.575 MHz, 19:30
3rd March	VHF Net, 146.525 MHz, 20:00
9th March	HF Net, 3.575 MHz, 19:30
10th March	VHF Net, 146.525 MHz, 20:00
13th March	NZART HQ-Infoline
16th March	HF Net, 3.575 MHz, 19:30
17th March	VHF Net, 146.525 MHz, 20:00
18th March	Club General Meeting
23rd March	HF Net, 3.575 MHz, 19:30
24th March	VHF Net, 146.525 MHz, 20:00
29th March	NZART Official Broadcast
30th March	HF Net, 3.575 MHz, 19:30
31st March	VHF Net, 146.525 MHz, 20:00

10th April—NZART HQ-Infoline
11-12 April—NZART Thelma Souper Memorial Contest (WARO)
11-12 April—NZART Low Band Contest
15th April—Club General Meeting
26th April—NZART Official Broadcast
8th May—NZART HQ-Infoline
22nd May—NZART HQ-Infoline
30 May/1 June—NZART AGM & Conference (Br 12, Hamilton)
31st May—NZART Official Broadcast (Including Conference report)
6-7 June—NZART Hibernation Contest
1-2 August—NZART Brass Monkey Contest
3-4 October—NZART Microwave Contest
5-6 December—NZART Field Day Contest

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

Club Information



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88 Seddon Road, Hamilton

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

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eMail: 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: FDM-DUO SDR transceiver that can be used attached to a computer, as well as standalone. <http://ecom.eladit.com/FDM-DUO/en>

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