

DERBY AND DISTRICT AMATEUR RADIO SOCIETY

Incorporating Derby Wireless Club (1911)

EVENTS RECENT AND FUTURE

AUGUST 2014

- 19th Talk - Top band and Medium Wave propagation
- 26th Night on the air

SEPTEMBER

- 2nd Junk Sale
- 9th Committee Meeting
- 16th Video Show
- 23rd To be announced
- 30th Night on the air

OCTOBER

- 7th Junk Sale
- 14th Committee Meeting

RADIO EVENTS - SUMMARY

SEPTEMBER 2014

- 13th, Churches on the Air. Station operated from St Osmund's Church on London Road, Derby. Call GB1SOC. Please note, operation on Sunday 14th will be the afternoon only.
- 27th, Railways on the air weekend. As usual, we plan to operate from the 'West Shed' at Swanwick using the call sign GB2WS

Don't forget the 2m club net on 145.45 MHz on Christmas Eve and New Years Eve at 2.30pm.

We seem to hold nets intermittently throughout the year. If any member wants to run a club net at any other time, please let the secretary know and an email can be sent out to all the membership.

We could hold a net on LF/HF bands if anyone is interested?

DADARS Newsletter
August 2014

Introduction

Welcome to the August 2014 issue of the DADARS newsletter. This normally gets written on cold wet afternoons. However, the weather has been so nice lately it is a month overdue!

Club Talks

Members were treated to an excellent talk by Dave G8AXZ on Tuesday 20th May 2014 in the club room. The subject was: *"The RSGB UK Activity Contests, what they are and how you can get involved"*.

The evening was well supported and members were treated to a practical demonstration of Dave's portable contest station and his enormous pump-up mast supporting VHF and UHF antenna.

Club Activities

The Club supported a 'Fun Day' outing at the Ecclesbourne Valley Railway on Satur-

done that idea after finding a crucial component missing!

The photo below shows early morning frenzied activity prior to setting up the station. We later erected two dipoles; one for 40m and another for 15m.

The club operated on 7.0 MHz and the higher bands. As per usual, the band conditions were good in the morning with plenty of activity up to mid afternoon when most amateurs break for a siesta. A good time was had by all who attended.

The Club later returned to Duffield junction on 24th to 26th May, Spring Bank Holiday, to operate a station from the guards van at Duffield Station in support of the Ecclesbourne Valley Railway.

This corresponded with Wirksworth Carnival Weekend making it a busy day with



All hands to the pumps erecting the Club gazebo - Duffield Junction 10th May 2014

day 10th May using the call G2DJ.

This year, the weather was kind and the two events in May were helped by pleasant sunshine. The plan was to erect the Club large gazebo. However, we aban-

plenty of the public travelling between Duffield and Wirksworth. It proved a nice day out for the family with good weather, a chance to play radio and an opportunity to natter to people in general.

More Events and Club Happenings

Saturday September 13th and Sunday afternoon Churches on the Air

The station will operate from St. Osmund's Church on London Road, Derby just next to Wickes store. Dave G1VAB successfully acquired the NOV and we will use the call GB1SOC. If you want to help, operate, log or do all three, please talk to Dave G1VAB at one of the next club meeting.

National Ham Fest, Newark

DADARS normally supports the Ham Fest at Newark. However, to make it worthwhile we need junk to sell. During the last year, our sales have been so successful that our junk stock is low. Hence a decision was made to miss this year and to allow our junk continuum to replenish.

September 27th and 28th Railways on the air weekend.

As usual, we plan to operate from the 'West Shed' at Swanwick using the call sign GB2WS. Dave G1VAB obtained the NOV and we have permission to operate from the site. This weekend overlaps with the National Ham Fest that runs on Friday and Saturday.

October 18th and 19th Jamboree on the Air

This activity is in support of Belper Scout HQ and may include operating overnight. We are still waiting for confirmation - more details will be available nearer the time.

November 8th Bonfire in the Car Park

Combustible items are required mid-afternoon for an 18:00 local lighting of the bonfire. This is a good chance to clear out the garage and burn all that rubbish.

Radio Club Nets

The Club will hold a club net on 145.45 MHz on Christmas Eve 24th December and New Years Eve 31st December at 2.30pm.

Junction 28

The Club supported the J28 rally and sold some junk. The turn out was good - thanks go to Martin & Jenny, Bill & Pat, Colin, Andy, Dave, Clive and Dave G1VAB for manning the stand.

Happy Birthday Dave

Dave G1VAB reached the grand age of 60 on Tuesday 5th August. Dave is always looking for an excuse to tuck into a good nosh-up and play his 1970s records.



Dave Contemplating the Birthday Cake

Accordingly, Dave invited members from DADARS and the Church to celebrate the event with a party in the main hall at the United Reformed Church, Carlton Road on Saturday night 2nd August. Dave organised a collect for charity and raised a very respectable £208.33 for the RNLI charity and £148.33 for the Church.

My only reservation was Dave's play list that included the 'Wombles of Wimbledon' amongst others. Despite that, the event was very enjoyable and well supported with enough people to fill the hall.

Fish and Chip Supper - 23rd December

The club usually holds an annual Christmas social event in the club room. Last year it was Fish and Chips supper with mushy peas. It seemed to go down well in more ways than one.

This year we plan another Fish and Chips evening for 23rd December 2014. If you fancy a gastronomic experience and heart burn, please come along. It should be a good laugh and a chance to natter.

This year we hope to be more sensible when ordering the quantities - last year we ended up with an overbearing fish and chips extravaganza that proved too much for most of us.

Bygones

A Club member once suggested that interesting articles or prophetic statements from old DADARS newsletters could be included in current newsletters. Interesting and relevant articles were few and far between but an interesting letter to the editor was found. This is a quote from one of our past newsletters - in this case 40 years ago . This is included because in some ways the comments are both relevant and out of date at the same time.

"Are we in the club not living in the past? We are proud of the clubs' collection of old wireless gear, and rightly so, but do we not give too much prominence to things of yesteryear? A great portion of our activities seem to be devoted to past glories, should we not aim to have more on the club programme directed to the present and future of amateur radio?"

Our hobby is in great danger now, both from commercial pressures on frequencies and from the lack of home construction. If the cheque-book is not to take over from the soldering iron we should do all we can to encourage individual work and not live in the past.

The younger SWL needs help to tackle amateur radio in 1974, he needs advice and guidance. Remember the past certainly, but let us keep it in perspective.

That's the view of one of our readers, what do you think? If you feel strongly one way or the other, let us have your comments for the next issue."

That was 40 years ago - It seems that nothing changes. In case you are wondering, the above text is in a font called "mom's typewriter". Finally, I have included an advert from the G3ERD magazine October 1949. This is definitely peculiar but strangely still relevant!

Because you are a Ham!

There's no need to dress like one!!

Pay a visit to

SYDNEY BRADLEY

THE MAN'S SHOP

*40, EAST STREET
DERBY*

Phone Derby 2008

Personally, I find the above generalisation slightly offensive - perhaps radio amateurs were scruffy in 1949? It is certainly not the case now?

WSPR - A Members Experience

WSPR is an amazing mode. In short, it is an automated digital mode that allows communications with other automated stations elsewhere in the world. No human intervention is required - the logged results update automatically onto an internet website. You can check the progress of your station from wherever you happen to be.

I tried the mode on 22nd June 2014 on 14MHz using QRP to see how far my signals can travel. Over a 24 hour period, using a Yaesu FT-1000MP throttled back to 1 Watt (yes - 1 Watt only) and a long wire antenna, my computer worked 93 other computers positioned around the globe.

Stations I worked included: Four VK stations in Australia (10600 miles); Two JH stations in Japan; Loads of American stations including Alaska; Eastern Russia (Further east than Japan!) and loads of Europeans.

Station Setup

The web contains many articles explaining how to set up WSPR so I will keep this part simple. In reality it is very simple. First download the software from <http://physics.princeton.edu/pulsar/K1JT/wspr.html> and then fill in your call sign, locator and power in dBm. For me this was: G4AKE, IO92GV and 30dBm (30dBm = 1 Watt).

It is necessary to interface the receiver audio output to the sound card input and sound card output to the microphone input of the transmitter. Ideally a professional interface should be used.

In my case, I used a two ended 3.5m stereo lead. One end plugged into the headphone socket on the receiver and the other directly into the sound input on a laptop. I used a second lead with one of the 3.5m plugs replaced with a microphone plug – a bit crude. The hardest part is fiddling



Stations Worked in One Day Using WSPR - Power level 1 Watt

WSPR is useful for comparing antennas or investigating propagation conditions. However, it is not really a communications mode: the only information you can send is call sign, power and location. You cannot send user information - not even a hello.

It is certainly exciting. As the day progresses, you can see the paths to various parts of the globe open and the signal reports start to flood in.

with WINDOWS sound levels to get the transmit drive correct and the receiver output level correct. The software includes a receiver level indicator. It is essential that the transmitter microphone input is not overloaded - check for this by ensuring the RF output can be controlled by the microphone gain control and turn it down to a relatively low level.



The interface used at G4AKE is simple but embarrassing

I set the frequency by adjusting my FT-1000MP to 14.0956MHz by hand. The frequency control of the transmitter must be good and be capable of holding to within a few Hertz over a period of time. The FT-1000MP seemed more than adequate.

The computer time on the laptop must be accurate - it is best to set the clock to automatically update from the internet. For transmit receive control, I used VOX on the transmitter. It was crude and fiddly but worked once setup. If you desire, the transceiver control can be via CAT using the RS-232 connection - this is an option and not mandatory.

How Does WSPR Work?

The call sign, location and power information is squeezed into a data block 50 bits long with 28 bits allocated for call sign, 15 bits for locator and 7 bits for power level.

A non-recursive convolutional forward error correction (FEC) code with interleaving is employed that adds redundant information increasing the data length to 162bits. The extra 112 bits is redundant information that allows the error correction to work.



It is essential that noise is not allowed to mask the signal otherwise the content of the message can be lost leading to confusion.

The road sign in the Photo is Canal Street in Derby

If random data errors occur during transmission, the FEC in the receiver detects and corrects them providing coding gain. I am not sure how many errors can be corrected but with other codes such as Reed Solomon, the number of corrections is related to the difference between message and transmitted message. In this case, typically $(162 - 50)/2 = 61$. If WSPR can correct approximately 61 code errors out of 162, then it is very powerful. The coding gain is equivalent to running more power.

The modulation is continuous phase 4-FSK with tone separated by 1.4648 Hz requiring a bandwidth of only 6Hz. This is the strength of the mode - the 6Hz bandwidth is achieved in the computer sound card by digital filtering. Compare the potential noise reduction against the 2.5kHz SSB bandwidth of the FT-1000MP:

$$\text{Noise reduction} = 20 \cdot \log_{10} \left(\frac{2500}{6} \right) = 52 \text{ dB}$$

The downside is long transmission times. The transmission data rate must obey Shannon's law

$$\text{Transmission Rate} = B \cdot \log_2 \left(1 + \frac{S}{N} \right)$$

Here, B is the bandwidth approximately 6Hz and S/N is around -15dB. Don't forget, the logarithm is base 2 not base 10. The transmission rate works out at 1.4648 baud. Transmitting 162bits requires 110.6 seconds at this rate.

In practice, WSPR will work with signal levels down to about -28dB below the noise in a 2.5 kHz bandwidth.

The full description of the code is very complex and 'every trick in the book' is used to maximise transmission efficiency. However, to use the mode, it is not necessary to know any of the complexity. The code is activated by one click of the mouse.

Conclusion

Despite working 93 stations and several continents on June 22nd 2014, the band conditions were not particularly good. Listening on SSB, the band seemed normal to dead. It just shows that the stations are out there but the transmission path losses are just too high to work them.

WSPR is also a great mode if you want to test antenna. Last year, I compared two Topband antennas using a Russian WSPR station near the Arctic Circle using 5W with conclusive results. I compared a vertical against a horizontal wire - the vertical worked better for DX!

That's it for this newsletter - the next will be out around November/December - Best Regards: Chris G4AKE