

# HARCNEWS

Newsletter of

Horsham Amateur Radio Club

Est. 1938



G4HRS

## September 2006

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# Notes From The Editor

Welcome to the September edition of HARCNEWS. I trust you are all refreshed after any summer breaks you may have taken. Those who have volunteered for SSB Field Day should be in receipt of the Rota which I have been informed is written in clock time to avoid any possible confusion.

I would like to thank David G4FQR for writing the report of last months club meeting. Club meeting reporters have been arranged for the rest of this years meetings but if you would like to volunteer for next year please contact a committee member and let us know.

You will find enclosed with this newsletter a current members list. If there do happen to be any errors please let the Treasurer or myself know and they will be updated.

In preparation for the big digital TV switchover I have produced an article which will you help you from seeing snow on your screen

afterwards!

In the Radio Diary this month you will notice that the next Leicester Rally is coming up. If you have not been to this one then now could be the time to consider going.

I went a few years ago and at that time it was held in the city of Leicester itself in the Granby Halls which was rather small for the amount of traders and visitors. The new venue at Donnington Park is excellent and there is plenty of room to wander around the stalls.

There are not only traders inside but also outside with plenty of bits and pieces to be found. This year sees some good lectures on and there is plenty of car parking space.

I now hope you will all go and clear your shack and attic of unwanted items to bring to the Junk Sale next month.

See you then

David G4JHI

# September Meeting Review:

## WSJT, Modern data methods for EME and Meteor Scatter communication

by John Matthews G3WZT

WSJT in the title of John's lecture derives from Weak Signal and K1JT and denotes a suite of three computer programs developed by K1JT for communication at VHF via Earth-Moon-Earth (EME) reflection and Meteor Scatter (MS).

The programs make heavy use of DSP and have revolutionised EME and MS operations by enabling communication at much lower signal levels than old school techniques such as slow CW. So modest stations can now participate but as far as is known John is the only HARC practitioner in this challenging branch of the amateur radio hobby.

Using the moon as a reflector involves: a round trip of 500,000 miles, "hitting" a small target (the moon subtends an angle of only 0.5 deg on earth), poor reflectivity of the moon surface – only 6%. The overall effect is a path loss of some 252dB.

The JT65B program is used for EME. This encodes the data as 64 tone FSK with 60sec TX and 60sec RX periods. Timing of these periods has to be better than +/- 1sec, easily managed these days by computers locked to Internet clocks.

Due to the motion of the Moon relative to Earth up to 300Hz Doppler shifts occur

but are handled by the software and incidentally help distinguish true EME signals from tropo propagated signals (without Doppler shift).

MBA's (mighty big antennas) used to be essential and the leading stations still use them. John showed pictures of some amazing ones such as 64 x 15 ele Yagis (RN6BN).

These beauties are fully steerable in elevation and azimuth and have crossed elements so that switching between horizontal and vertical polarization is available as required to cope with Faraday rotation in EME.

Compared with that we have to grant that John's own 2 x 12 ele Msquared bayed Yagis on 18ft booms is in the "modest" class! He can rotate them in azimuth but not elevation and this limits his EME operation to moon elevations below 23 deg.

He gets good results using 400W and said stations with only 100 – 150W into a

10 ele Yagi can succeed thanks to WSJT. For MS on 2m the FSK441 program is used which generates and decodes 4 tone fsk at 441 baud.

The reflecting meteor trails are about 100km above the earth with durations of about 1 second. TX and RX take turns of 30sec periods each. Being FSK the TX duty cycle is 100% so care is needed not to overheat the p.a. The JT6M program is optimised for MS on 6m and is also useful for weak signal tropo operation.

Some of the transmissions from GB3VHF on 50.230MHz use JT65B or JT6M and we heard samples John had recorded of the pleasant sounding FSK.

In Websearch are listed a selection of sites John recommended as of interest not only to the EME / MS operator but also more generally. I came away from this lecture feeling a bit of the Crocodile Dundee challenge: "You call that amateur radio? This is amateur radio!"

Well done John!

# Websearch

WSJT software (freeware): FSK441 for MS on 2m and above; JT65B for EME; JT6M for MS on 6m and also for weak signal tropo:

<http://pulsar.princeton.edu/~joe/k1jt/>

DX Cluster software found by Les (G3VQO), to use on Internet (Broadband / ADSL connection):

[www.ve7cc.net](http://www.ve7cc.net)

DX Summit cluster software:

[www.oh2aq.kolumbus.com/dxfs/](http://www.oh2aq.kolumbus.com/dxfs/)

VHF Chat Page (skeds are arranged here):

[www.on4kst.com/chat/start.php](http://www.on4kst.com/chat/start.php)

Hepburn Tropo Forecast:

[www.dxinfocentre.com/tropo\\_nwe.html](http://www.dxinfocentre.com/tropo_nwe.html)

Ionogram from Dourbes:

<http://digisonde.oma.be/cgi-bin/latest.exe>

US Naval Observatory Data Services:

<http://aa.usno.navy.mil/>

Winlog32 logging software (freeware) by G0CUZ:

[www.winlog.pwp.blueyonder.co.uk/winlog/](http://www.winlog.pwp.blueyonder.co.uk/winlog/)

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# The Digital Switchover

Many of the British population will now be aware of the impending switch off of analogue television in the UK. Some are confused which is not surprising often because of misleading information being given or perhaps the lack of any.

One of the most asked questions is; after switchover will I be able to watch one channel whilst I record another? As we go along with this article answers to this and other queries will be found.

Starting at the end of 2007 analogue screens in the Border TV region from the Whitehaven transmitter will be switched over to digital. This was originally scheduled for 2008 but has been brought forward.

Viewers will then need either a set top box or integrated TV set for reception through an aerial. It is also possible to use a computer if it is fast enough and has the appropriated hardware.

Converting the first TV set is a fairly easy option but many homes have 2 or more sets that could mean an expensive business!

As the time at each transmitter comes for the analogue to be switched off BBC2 will be first and there will be a banner prior to this advising that the service will be switched off.

A few weeks later the other channels start to disappear! One of the changes is that currently the digital terrestrial services are transmitted around 20dB down from the analogue.

At switchover they will be brought in line with an increase in power to give similar coverage. Saying that though priority will be given to the PSB (Public Services Broadcasters) such as the BBC and ITV.

Although all the UK transmitters are being prepared for digital transmission some areas may still be unable to

receive all the possible channels in the future!

At switchover it is believed that some channels vacated by an analogue service will be immediately replaced by a high power digital multiplex.

At some transmitters after switchover some of the channel groups used may change so if replacing or fitting a new aerial prior to then it is safest to fit a wideband aerial. The only problem here is that the wideband version has a lower gain than a grouped aerial.

There are currently 6 multiplexes but after switchover it may be possible to increase this and more channels could be accommodated with new compression protocols. Some of the TV spectrum is likely to be sold off to other users.

One thing of note is that Channel 68 will not be used after the switchover and this currently transmits C4 at Midhurst and is a difficult catch in some places!

A PVR (Personal Video Recorder) is the item you need if you wish to record one digital channel whilst watching another. There are several on the market now and one of note is made by Topfield.

The editor knows a friend who uses one of this brand and cannot fault it with ease to use features and can be programmed for recording by it's EPG (Electronic Programme Guide).

The most notable feature is that it is possible to record 2 channels whilst watching a third and yes this is all digital! Unfortunately it is unlikely to be found in the majority of common retailers but can easily be bought from various satellite stores.

For those of us in the Meridan and LWT/Carlton regions the switchover takes place in 2012. Currently there are restrictions on some services that would be receivable in the Horsham area to protect the current analogue services in neighbouring areas but hopefully in the future

they will be lifted. Here is a guide to the transmitters in this area that may be received: Guildford – Southwater/Rudgwick/parts of Horsham, Midhurst – Horsham and surroundings, Heathfield – Cowfold/Partridge Green, Reigate – Crawley/parts of Horsham, Crystal Palace – Roffey/Crawley.

Those who watch the analogue transmissions from Crystal Palace in this area may receive acceptable pictures along with aircraft flutter but the performance on digital transmissions will most likely give start/stop reception that will be found most unacceptable!

For checking purposes when installing an aerial system

a 6db attenuator can be fitted between the aerial and TV set and if all services are received ok then there should be enough leeway for variations in signal levels.

This doesn't necessary help though if there are problems during bad weather from damp trees attenuating the signal; so if possible perform the tests in these conditions.

The coax from the aerial should be a continuous length for the best digital reception and fed directly into any digital equipment before anything else if possible.

For further information you can visit:

[www.digitaluk.co.uk](http://www.digitaluk.co.uk)

Please send contributions for the October edition of HARCNEWS to the editor by 16th September. Items received after the deadline will be held over until a later edition.

All input is subject to suitability and available space.

For items sent by email please send to this address:

[harc.news@g4jhi.co.uk](mailto:harc.news@g4jhi.co.uk)



Above - boat belonging to David Jones G4FQR. Many have heard about it but never seen it.



Above - boat belonging to David Sumner G3PVH - note G4FQR boat in the background!

They sail with and are members of the DCA (Dinghy Cruising Association): [www.dca.uk.com](http://www.dca.uk.com)

## Radio Diary

Sep 2nd-3rd SSB Field Day 14:00 - 14:00

Sep 7th Club Night: Efficient Loops, the latest - G3LHZ

Sep 8-9th Leicester Amateur Radio Rally

Sep 14th Committee Meeting - QTH of G3ZBU

All above times are BST

Club Meetings and socials start at 8pm