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# NKRS Newsletter

Issue 154

Our next meeting 19th March 2019 will be at our new location.  
**The Hurst Community Centre, Room 15, Hurst Place, Bexley, Kent, DA5 3LH**  
 Doors open at 8PM  
 Room 15 is located on the 2nd Floor

Date	Event
19 March 2019	Talk by Bob Burns G300U Receivers over the ages
2 April 2019	Talk by Ian Keyser G3ROO on antenna modelling
16 April 2019	Natter Night
30 April 2019 **	5th Tuesday
7 May 2019	Natter Night
21 May 2019	Morse practice night to be confirmed
4 June 2019	Natter Night
18 June 2019	Talk by Ian G7PHD on the AOR DV1
2 July 2019	Natter Night
16 July 2019	Members talk on their favourite software
30 July 2019 **	5th Tuesday
6 August 2019	International Lighthouses ans Lightships event planning
17/18 August 2019 **	International Lighthouses ans Lightships weekend

\*\* after the date Denotes that this is not a normal club night

**Please note that we have a guest speaker for this and our next meeting so please try to attend and feel free to bring a guest with you.**

Guests are always welcome at our meetings.

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## For this weeks meeting we have a guest speaker

Bob Burns C Eng, FIET, MSE G300U

Bob has many years of experience in the electronic and communications industry and his talk is going to be on a subject in which I am particularly interested.

**Please note that Bob asks members to bring along an example of a very old component or receiver for display.**

There are stairs to the meeting room so I would not suggest bringing along an AR88, B40 or anything of similar weight. I hope to bring the receive section of a WS 18 which does not weigh too much

### Receivers Over The Ages by R.F.Burns G300U

This illustrated talk will review the designs of receivers and their underlying technologies from before the outset of the radio era to the current time including the internal electronics and outer finish.

Topics to be covered include:

- Technology Timelines – who did what and when.
- Passive Detectors – including the Coherer, Cats Whisker and less common detectors
- Early and later crystal sets and TRF Radio
- Active Detectors including the reaction and super-regenerative types
- Autodyne Receiver
- Superhet Design Examples from WWII to date
- Digital Receivers

The talk will finish up with a brief explanation of inter-modulation issues, simple measurements of FM deviation and pictures of the presenter's shack and test bench.

**As the oldest electronic item I possess is a pair of second world war high impedance headphones, club members are asked to bring along an example of a very old component or receiver for display.**

After qualifying in 1962/3 I spent twenty something years as an RF designer on HF and VHF communications systems, eight years in the petro-chemical industry working on fire detection systems including learning software skills and another twenty something years developing database systems and quality analysis systems for accounting and personnel applications up to



Crystal detector from a Revophone crystal set

Circa 1923

## The last meeting

Was a talk by Chris G0FDZ on Millimetric Microwaves

Chris is a man of many talents but the two that exhibited themselves well during this meeting were his superior constructional skills and his talent as an excellent speaker.



Band in Frequency	Band in mm	Number of users in UK Approximate figure.
24 GHz	12 mm	50
47 GHz	6.0 mm	15
76 GHz	4.0 mm	12
122 GHz	2.5 mm	3
134 GHz	2.0 mm	7
241 GHz	1.2 mm	3

During the talk Chris guided us through his microwave adventures which included setting distance records and building some very impressive equipment which was on show during the talk.



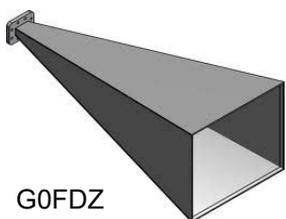
He shared with us his frustrations of trying to fix expensive diodes the size of a full stop and trying to find them after they fell on the carpet in his shack.

It was explained to us that some of the new microwave territory is largely unexplored and some frequencies, in particular above 100 GHz use techniques some of which are unfamiliar even at lower microwave frequencies.

The point was made that generally you have to build the equipment or modify commercial equipment that is available on the surplus market for some bands. You cannot just go to your favourite amateur radio store and buy a 134 GHz transceiver and go on the air.

There are some commercially available (expensive) modules but you can't just buy them and bolt them together like an IKEA kit and get on the microwave frequencies.

Contacts on these bands are by appointment as various factors must be taken into account. The predicted path must be checked along with losses caused by atmospheric oxygen and water vapour. There is much still to be learnt about propagation on the higher frequencies. The mode of operation is CW or SSB



On 24 GHz a special type of coax cable called semi-rigid coax is used for very short runs within equipment as otherwise the losses can be high. Coax connectors can introduce too much loss at these frequencies and apart from special types, the SMA is the only type that is useable. For lowest loss, waveguide is used and several samples were passed round during his talk, as were horns and dishes which are use as antennas.



There are a few beacons around for test purposes on the 24 and 47 GHz bands with proposals for some on 76 and 134 GHz. As you may not be in range of any of these a personal beacon is useful if you intend to operate on these





Modern Transverter system with a 2 watt HPA and GaAs FET LNA



Microwave Horn Antenna  
Photograph by Tony Fishpool G4WIF



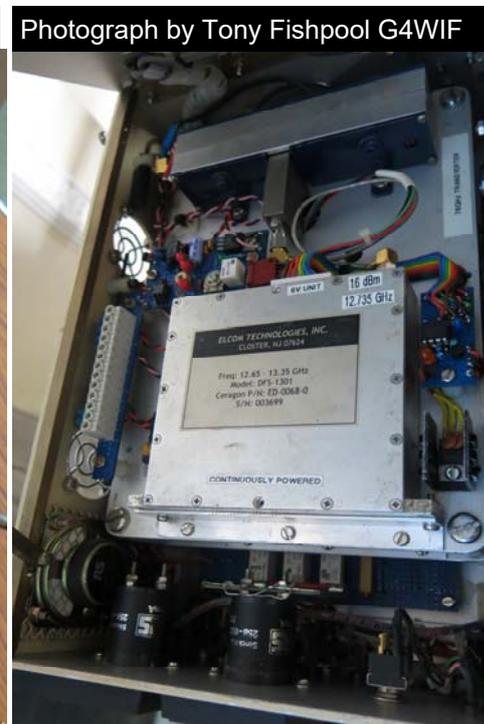
Chris G0FDZ's end of the first UK QSO path over 120m on 122 GHz 2.5mm



Chris G0FDZ operating from Ditchling Beacon in 2013 to break the then UK distance record

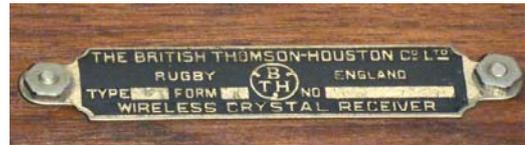
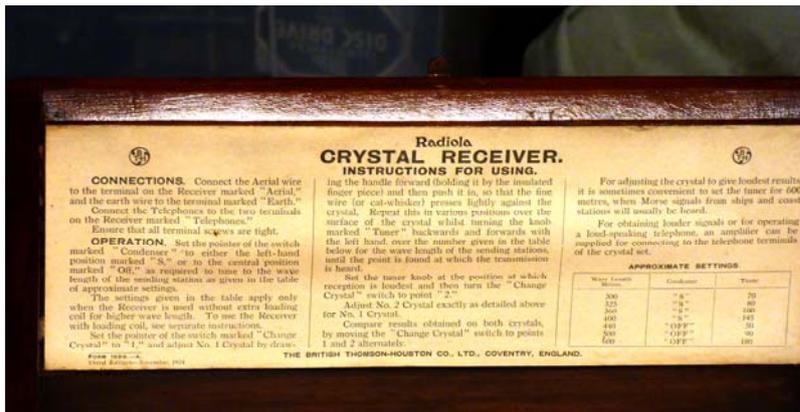


**Above and Below** are some examples of Chris's construction on show during the talk.



An interesting point Chris made was that operating on these bands should be encouraged or they may get lost to commercial users and if we as amateurs get complacent about these possibilities it may be your favourite bands that Ofcom sell off next.

Thanks to Chris for an excellent evening.



A rather attractive crystal set by BTH dated 1926  
One feature of this receiver is that it has two crystal detectors, a feature I have not seen in many sets.

ws18



The Wireless Set No.18 was the first volume production man-pack radio station for the British Infantry.

The WS18 equipment consists of separate tuneable transmitter and receiver modules mounted as a back-pack carrying case (that I would not want to have to carry), complete with an internal battery mounted.

## Ofcom Auction

In December Ofcom announced that it is planning to auction 200MHz of spectrum (80MHz in the 700MHz band and 120MHz in the 3.6-3.8GHz band) for mobile services by spring 2020 and has published plans for spectrum sharing to "support innovation and local coverage initiatives".

Ofcom states that use of the 700MHz band will help to provide good mobile coverage, both indoors and across very wide areas, including the countryside, while the 3.6-3.8GHz band is suitable for supporting "lots of data-hungry connections in concentrated areas" and can be used to provide 5G services

Winners of the bid will be expected to do the following in the next 4 years  
Extend good indoor/outdoor data coverage to at least 90% of the UK  
Improve coverage for at least 140,000 homes and offices that are not already covered  
Provide coverage from at least 500 new mobile mast stations in rural areas

The price for winning airwaves that carry these rules will be discounted but up to £400m because of the investment required and the social benefits they will bring.

For more information see

<https://www.ofcom.org.uk/consultations-and-statements/category-1/award-700mhz-3.6-3.8ghz-spectrum>

Ofcom has also published plans to allow certain spectrum to be shared by different uses to "support innovation and local coverage initiatives".

To see the consultation document see the link below.



As those of you who know me ,and those who read this newsletter are aware I very much love London.

I am pleased to say that it is not necessary to display signs like the one to the right anywhere and I hope the sun does not rise on the day when they are needed.

Photograph by Tirza M3YIB

**That's all for this issue, please try to attend the meeting on Tuesday and I look forward to seeing you there.**

**Dave Collings**