



Chelmsford Amateur Radio Society Newsletter

April Meeting

Tue 5-Apr-2022, 7:30pm

Online by Zoom

Radar History - from 1895!

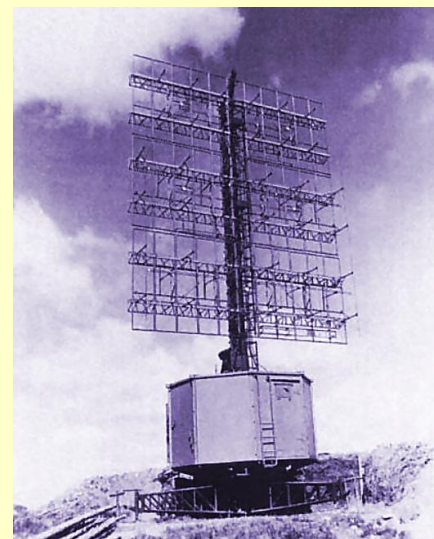
By Philip Benstead

Our April talk provides a fresh perspective on the history of radar. Philip Benstead has been involved with the development & implementation of radar systems from 1964 through to 2020, including a time with Marconi Radar at Great Baddow

He was a student apprentice with The Marconi Company in the Chelmsford area.

Philip's talk starts in 1895 and then follows the paths of radar development up to and through WW2, links to the 1982 Falklands Conflict, and ends with a brief summary of current systems.

After hearing a talk by a German radar historian, Philip researched the long history of radar and presents a version that questions many common beliefs e.g. Britain invented radar & the magnetron.



German Freya Radar

Zoom:

Quick Link:

<https://us02web.zoom.us/j/8381174496?pwd=VTIycHVEYUtocmVmS0hvQ2lWWHN5QT09>

- Meeting ID: 838 1117 4496
- Passcode: 417316

CARS On the Air: April 23rd is International Marconi Day – Volunteers and Pre-Registration required

- see details in inside

In this issue:-

Club Diary.....	2	International Marconi Day 2022	5
Club Nets.....	2	Coming Up: Steve Hartley G0FUW & QRP	5
Training & Morse Classes	2	This Week's Bargain	5
March Meeting: Digital Amateur TV	3		

Club Diary

Tue 5-Apr-2022	Club meeting: Radar History	Online by Zoom
Sat 23-Apr-2022	International Marconi Day – Operate GX0MWT !	BAE Great Baddow
Tue 3-May-2022	Club meeting: Steve Hartley G0FUW - QRP	Danbury tbc
Sat 21-May-2022	2MT Celebration Special Event / Demo	Writtle Village Hall

Club Nets

CARS meets for talks/events on the first Tuesday of the month. The subsequent Tuesdays have club radio nets as follows below and dates listed on our calendar at www.g0mwt.org.uk/main/events/categories/net/ :-

- 2nd Tuesday in the Month – VHF**
 The CARS VHF FM Net uses GB3DA from Danbury starting at 8pm (local).
 GB3DA is 145.125MHz Input and 145.725MHz Output - and CTCSS-only (110.9Hz), 2min timeout
 If for any reason GB3DA is not available then 145.375 Simplex will be used. Vertical aerials are best for this
- 3rd Tuesday in the Month - UHF**
 The CARS UHF FM Net uses GB3ER from Danbury and starting at 8pm (local).
 GB3ER is 434.675MHz Input and 433.075MHz Output - and is CTCSS-only
 Vertical aerials are best.
- 4th Tuesday in the Month - HF**
 The CARS 80m Net on "3756kHz" Night, SSB and starting at 8pm (local).
 Horizontal aerials are best. The idea is to enable distant CARS Members to join the Net.
- 5th Tuesday in the Month (when there is one!) - MF**
 This is the CARS Top Band Net on 1947/1950 kHz +/-QRM, LSB and starting at 8pm (local).
 Horizontal aerials are usually used for this Net. A reminder - limit your power to a max of 30 Watts, please.

Training & Morse Classes

CARS Training classes at Danbury:

If you are interested in these or other opportunities in 2022, please contact **John O'Connell M0JOC** our training coordinator and Exam Secretary

We currently are running fast-track courses at Danbury to assist with the Intermediate and Full

John can be contacted via training2022@g0mwt.org.uk or 07868-004380

More info and other updates are at: www.g0mwt.org.uk/training

Online Morse Classes: Thursday evenings at 7pm. Coordinated by Andy G0IBN who has on-air practice sessions and via Skype too... <https://join.skype.com/clsfKXKmlNvf>

- contact Andy via morse2022@g0mwt.org.uk

 Follow @TrainWithCARS

March Meeting: Digital Amateur TV

CARS were pleased to have leading developer and RadCom columnist Dave Crump give the very colourful February talk on the innovative world of Digital Amateur TV (DATV). This is real fastscan and has seen huge progress over the years. It has evolved from 405 lines and valves to take advantage of digital technologies so that high definition colour modes and more.

Until the 1990s the dominant mode was FM-ATV and needed such bandwidth it was largely confined to 23cm, where it is well supported by tv repeaters as well as on the 10 GHz band. Analogue ATV has long since gone from 70cm.

However the amateurs have made major strides by adapting digital modulation and codecs so its bandwidth has dropped substantially to the point it is now common on 437MHz, and 146 MHz where it can achieve great distances, as well as highly portable equipment in the microwave bands up to 47 and 76 GHz.



Band-by-Band

<ul style="list-style-type: none"> 50, 71 & 146 MHz <ul style="list-style-type: none"> - The "new" ATV bands - Digital RB-TV 70cms <ul style="list-style-type: none"> - Digital only on 437MHz 23cms <ul style="list-style-type: none"> - Analogue (FM) and digital - Activity on repeaters and simplex 13cms <ul style="list-style-type: none"> - Repeaters and simplex - QO-100 Uplink 3.4 GHz <ul style="list-style-type: none"> - Digital only - Excellent results - Repeater Outputs 	<ul style="list-style-type: none"> 5.6 GHz <ul style="list-style-type: none"> - FM ATV for under £20 - Repeater inputs 10 GHz <ul style="list-style-type: none"> - Repeaters and simplex - QO-100 downlink 24 GHz <ul style="list-style-type: none"> - DATV - 136 km achieved 47 GHz <ul style="list-style-type: none"> - DATV - 74 km achieved 76 GHz <ul style="list-style-type: none"> - DATV - 66 km achieved 122 GHz
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What can you Achieve?

- Typical home station:
ATV range on 70 cm
is 30 - 50 miles
- Fully quieting on 2m FM:
Pictures and stereo sound
on 146 MHz
- Portable: 80 - 100 miles on
any band 146 MHz - 10 GHz
- QO-100:
Brazil, Greece, India.....

DATV (and some FMATV) is on more bands than ever

The latest developments have seen the 50 MHz bands brought into use around 51.7 MHz as it only needs ~300kHz of bandwidth which is achieved by DVB-S2 (QPSK) and High Efficiency Video Coding (HEVC, H265 picture coding, but does need very linear amplifiers. This ongoing progress has recently seen the top of the 29MHz/10m band now also available in the latest band plans for DX experiments. QPSK based modes remain the most common but ongoing work to develop narrowband OFDM is underway which has better multipath performance for long distance DX.

David showed how BATC and others had adapted Raspberry Pi's, but also designed and made available DATV equipment such as the 'Minitoune' receivers and 'Portsdown' DATV transceiver.


Another landmark facility is that the QO-100 geostationary satellite has a DATV transponder enabling huge coverage over Europe, Africa & Middle East etc. Uplinks are in the 2.4GHz amateur band with downlinks in 10.4 GHz very easily receivable using a modified LNB. To assist CQs and operation, there is an online SDR at Goonhilly which also has a chat-text window.

Portsdown DATV Transceiver

- The BATC project to bring DATV to everyone
- Based around a Raspberry Pi 4
 - Touch screen control
 - RF output via LimeSDR Mini or Pluto
 - Optional DATV receive capability
- Requires some hands on construction
 - "I made that!"
- Easy way to get DATV on air at low cost

MiniTouner

- Satellite TV tuner with USB interface
- Latest version tunes 144 – 2600 MHz
- Symbol Rates 66 kS – 20 MS
- Easy construction



QO-100 on Es'Hail-2 is the first amateur geostationary satellite

- QO-100 wideband is an 8 MHz wide transponder
 - 2.4 GHz up, 10.49 GHz down
 - No spot beams – covers 1/3 of the earth!
 - Dedicated to DATV use
- DVB-S2 is preferred modulation
 - Occupied bandwidths can be 100 kHz – 2 MHz
- A fantastic opportunity for amateur TV experimentation



Versatile equipment and a whole satellite transponder have helped transform amateur TV



It is not entirely digital. Beginners can have fun by adapting low cost consumer FM camera modules on 5.6GHz originally designed for drones that can be easily converted to the amateur allocation. BATC which has ~1400 members, also has an online wiki, forums and an online video streaming facility where many of the repeaters and other events can also be more accessible via the internet too.

During Q+A it was pointed out that Jeremy Royle did an early TV talk at CARS in December 1965 and that Tony Gilbey G4YTG knew Mike Barlow G3CVO at founding of BATC many years ago.

Many Thanks David!

Getting Started on Digital ATV

- Digital ATV can be complex but the ATV community has developed some DIY projects to make it easy:
 - MiniTouner USB RX hardware
 - Ryde DATV set top box
 - Portsdown DATV transceiver
 - Winterhill multichannel receiver
- Lots of support from the ATV community

Useful Links:

- BATC <https://batc.org.uk/>
- BATC Streamer <https://batc.org.uk/live>
- BATC wiki https://wiki.batc.org.uk/BATC_Wiki
- BATC Forum <https://forum.batc.org.uk/>
- 5.6 GHz https://wiki.batc.org.uk/5.6_GHz
- Portsdown https://wiki.batc.org.uk/The_Portsdown_DATV_transceiver_system

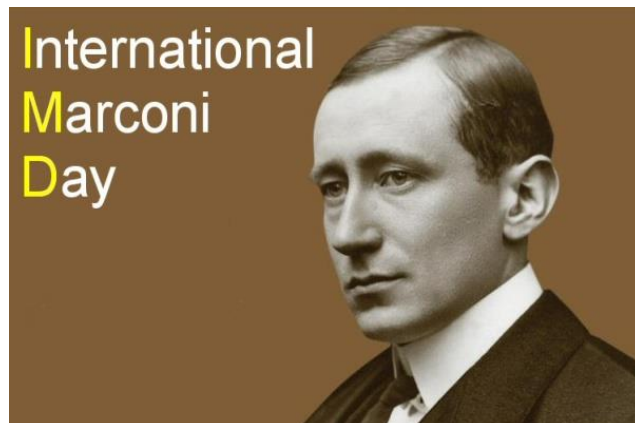
International Marconi Day 2022

Our next major operating event is IMD...

CARS is registered as an official IMD award station and operating as GX0MWT

This year International Marconi Day will be on Saturday 23rd April 2022. CARS are invited to operate from BAE Systems at Great Baddow, formerly the Marconi Research Centre.

It is hoped to operate a couple of stations on HF (80 to 10m) and also on V/UHF. The stations will operate from 1000 to 1600 BST. This year it is hoped that we can achieve the award for working 15 other IMD stations.



Operators / attendees

CARS members wishing to attend should email Paul G4PVM by 14th April to let him know what times they plan to be on site and which bands they would prefer to operate on. **NB pre-registration is essential.**

Coming Up: Steve Hartley G0FUW & QRP

For our next meeting on May 4th we are delighted to have **Steve Hartley, G0FUW**, who will be talking about **QRP** – operating with low power, the G-QRP Club and how he went from being a CBER to now being Chairman of the G-QRP Club.

Steve is also a Trustee of the RCF and leader of Bath Based Distance Learning – and a former RSGB Board member too!

In brief: **Is life too short for QRP, and how did I get here?**

NOTE: This meeting is planned to be the first physical one – at the refurbished Danbury Village Hall - tbc

This Week's Bargain

Once upon a time you would pay a fortune for precision verniers, micrometers etc

This one is surprisingly good value and comes in a nice box, including a spare battery!

Stainless steel, 150mm, nice large LCD display of mm/inches

Amazon:-

- Price: £22 inc free postage
- Item: <https://www.amazon.co.uk/gp/product/B01MAY5ECH>



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