



# Chelmsford Amateur Radio Society

Established 1936

Affiliated to the RSGB  
President-Carl Thomson, G3PEM  
Treasurer-Roland Taylor, M0BDB  
Club Call Sign-G0MWT  
Chairman- Chris Chapman G0IPU  
Vice President-John Bowen, G8DET



LOTTERY FUNDED

Newsletter No 589

Web Address: [www.g0mwt.org.uk](http://www.g0mwt.org.uk)

April 2015

## April Meeting

Tue 7-Apr-2015, 7.30-10pm

Oaklands Museum, Moulsham Street, CM2 9AQ

## "Raspberry Pi"

By Peter Onion G0DZB & David Whale

First released in Feb-2012, the Raspberry Pi has been a best-selling phenomenon with over 5 million of these low cost credit-card size computers sold. They use an ARM processor, can run Linux and have a variety of options for interfacing to sensors and radios. Originally targeted for educational use, a whole community has grown up around it.

Peter, G0DZB will be joined by co-presenter David Whale who is a STEM ambassador and Pi expert. So together they will enlighten us on how you can have your Pi and enjoy it!

Visitors are welcome, and CARS will have its famous raffle.



Raspberry Pi illustrated left.

The top Raffle prize at the April meeting will be a 'Raspberry Pi' together with a CamJam EduKit .

Why not take this opportunity to learn more about this exciting piece of British hardware and take your place at the forefront of computing!

Flash. The CARS Twitter page is live!  
Follow it at

<https://twitter.com/ChelmsfordARS>

Get the latest news as it breaks!

### Dates for your Diary

Tues 14 <sup>th</sup> , 21 <sup>st</sup> , 28 <sup>th</sup>	CARS - Evening Radio Nets @ 8:00 pm (Local). See Website for details.
Every Monday	Essex Ham 2m Net @ 2000h GB3DA
Saturday 28 <sup>th</sup> March	Essex 2m FM Activity Day 1300 – 1600h
Thursday 16 <sup>th</sup> April	Morse Classes resume – Danbury Village Hall
Monday 20 <sup>th</sup> April	CARS Skills Night – Danbury Village Hall
Thursday 23 <sup>rd</sup> April	St George's Day /P as GB1STG, Galleywood Common
Saturday 25 <sup>th</sup> April	IMD Cars operating GX0MWT from Sandford Mill 1000-1700h

**Nets** Tuesdays 2000h (14<sup>th</sup>) GB3DA, (21<sup>st</sup>) GB3ER, (28<sup>th</sup>) 1.947MHz

Net Controller for April is Carl, G3PEM

Thanks to Colin, G0TRM & John, G8DET for March.

March Meeting  
Tue 3-Mar-2015, 7.30-10pm  
Oaklands Museum, Moulsham Street

"The GB3VHF Story"  
By Chris Whitmarsh G0FDZ

Propagation beacons provide a vital service, but do you know what is in one? [GB3VHF](#) at Fairseat (formerly Wrotham) in Kent is a prime example and flagship for modern beacon technology. Transmitting on 144.430 MHz, it can be heard over 1700km away, reminding us of how propagation can vary and that VHF isn't always line of sight...

Beacon keeper Chris G0FDZ is no stranger to construction, from VHF up to millimetre wave bands. Over the course of ~70 slides, the talk gave an overview of some beacon essentials, followed by the history of GB3VHF (which is one of the worlds oldest beacons) and then details of the current beacon, its relocation to Fairseat, finishing with a preview of the new GB3UHF 70cm beacon.

GB3VHF has its roots as GB3IGY in Kent which was prompted by the 1956/7 International Geophysical Year, and operated over 1957/8. As a long term facility, GB3VHF itself started operating in December 1960 at the BBC Wrotham site in Kent and had involved amateurs working as BBC engineers. Originally transmitting on 144.500 MHz, later band plan changes saw it move to its current frequency of 144.430 MHz. Chris described with the aid of some fascinating illustrated slides how it evolved through several generations of hardware:-

1. Original Valve design and punched tape mechanical keyer
2. 1970 Discrete diode /transistor matrix keyer (pre-TTL)
3. 1980 Z80 microprocessor keyer
4. 2006 current GPS-locked synthesiser

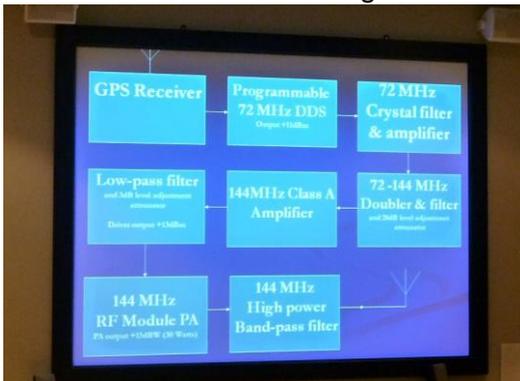


Compared to its outstanding performance and accuracy nowadays, early reports on the RSGB Bulletin (now RadCom) used to indicate its frequency drift (up to ~1.5kHz). Chris had kept some of the early hardware such as this driver unit:-

The former 1970s driver unit, included a Cathodeon crystal oven

In May 2003, Chris G0FDZ became the beacon keeper due to the death of the previous keeper Bob Merish G8JNZ. It was becoming obvious that a new generation of design and performance was necessary which led to the current

groundbreaking introduction of GPS-locked synthesis. This delivers not only a very accurate carrier frequency, but also adds a sequence of digital modes and phase reversals for weak-signal DX reception and scientific time-of-flight measurements.



The latest construction standards are also very high and it is designed to be fully accessible from the front of the 19" rack format. Interestingly the PA is fanless for maximum reliability and lower noise artefacts. In February 2010 both costs and access at Wrotham had become unsustainable. A lot of hard work occurred so that by April it was re-sited to the nearby BT tower at Fairseat (JO01EH). For this great care was taken with the professional antennas and feeders to achieve near identical coverage compared to its former Wrotham location.

Left - System block diagram for the current beacon



The current GPS-locked GB3VHF, which is received regularly across the UK and Europe

Chris finished with a rare preview of the new GB3UHF 70cms beacon which is similar in concept and will be on 432.430MHz. After a long gestation period, RSGB managed to get Primary User and Ofcom approval for a series of 70cm beacon changes in 2014. The new GB3UHF is a key element as it will enable comparisons with GB3VHF.

More information & photographs available [here](#).

**Science Sunday**  
**Sun 22-Mar-2015, 10am-5pm**  
**Museum of Power**



Coordinated by James 2E1GUA, CARS operated GX0MWT at the Museum of Power at Langford near Maldon for Science Sunday, 22nd March. This was part of a very busy activity period over Science Week. The museum was originally a pumping house and has a varied collection of classical steam engine pumps and other exhibits. Lots more detail & photos on the website [here](#).

**International Marconi Day**  
**Sat 25-Apr-2015 Sandford Mill**

**CARS Operating GX0MWT**  
**by CARS Members**

A promotional poster for the Sandford Mill Marconi Day event. The poster features the website address www.chelmsford.gov.uk/sandfordmill at the top. Below this, it reads "Sandford Mill SCIENCE EDUCATION CENTRE" and "MARCONI DAY SAT. 25 APRIL 10am-5pm". A small photograph of the Sandford Mill building is shown. The text describes the event: "Access to the Engine house and Barn Industrial heritage displays, Marconi TV camera and Morse key display and demonstrations." and "Essex Historic Military Vehicle Association." It also mentions "Talks, demonstrations and live radio transmission from Chelmsford Amateur Radio Society." and "A talk by Dr Elizabeth Bruton on The Marconi Company's role in WWI." The poster includes the text "ADMISSION FREE" and "LIGHT REFRESHMENTS" and provides contact information for Sandford Mill, including the address, phone number, and email. The Chelmsford City Museums logo is at the bottom right.

CARS will be at Sandford Mill operating GX0MWT on Saturday 25th April as an 'Award Station' as part of International Marconi Day. A full programme of activities is planned for both radio aspects and public visitors at Sandford Mill.

Chelmsford's former waterworks at Sandford Mill is primarily a museum collections store and science education resource however it is open to the public for special events during the year.

Sandford Mill has featured in TV programmes such as Great British Railway Journeys and The Wave Messengers. The building houses an extensive radio collection, with some equipment dating back to the

1890's. There is a series of five ship's radio room displays representing different decades including some very rare Marconi equipment from ships contemporary with the Titanic.

On Saturday, 25 April from 10am to 5pm the collection will be open to the general public to celebrate the birthday of **Guglielmo Marconi** who was born 25 April, 1874.

The Chelmsford Amateur Radio Society will be operating a demonstration station, call sign GX0MWT, in the historic Marconi 2MT Writtle broadcast hut which is now housed inside the museum.

On the first floor **Colin Page, G0TRM** and his team will be demonstrating the impressive Mechanical Morse and Morse Key display with the opportunity for the youngsters to try their hand at sending Morse. The Morse punched paper tape sending and decoding process always proves to be a big hit with potential junior CW operators.

During the day there will be several presentations in the Barn on the museum site. At 2:15 pm radio communications historian **Dr Elizabeth Bruton**, well known for her presentations at the RSGB Convention, will give a talk on Marconi. This includes details about the vital wartime contribution made by the Marconi Company and Marconi Company Engineers and staff employed by the British military during World War One. It will include a local element: the establishment of a signals interception station located in the Hall Street works in Chelmsford.

CARS Vice President **John Bowen, G8DET** will be giving three presentations titled "Saving Lives at Sea – up to and including the RMS Lusitania" at 11am, 1pm and 3.30pm.



Sandford Mill is run with the help of the Friends of Chelmsford Museums and other ex-industry volunteers. It relies on the support of several voluntary bodies including Chelmsford Amateur Radio Society, the Radio Officers Association, the Marconi Veterans Association and the Susan Trust. Susan is the last wooden Chelmer Barge and is undergoing restoration (financed by funds devotedly raised by the Susan Trust), before returning to her moorings at Sandford Mill.

The Museum is located in Sandford Mill Road, Chelmsford, Essex, CM2 6NY, admittance and parking are free. Web <http://www.g0mwt.org.uk/sandfordmill/>

## Obituary for Fred G2HNF Silent Key.

Fred Aaron Leach G2HNF died peacefully at home on February 11th, ten days short of his ninety-third birthday. Fred's funeral was on Tuesday March 17th at Chelmsford Crematorium where we said our good-byes and heard an interesting account of his life.

Fred grew up on Canvey Island and later the family moved to Chelmsford where he joined Marconis in 1937 as an apprentice instrument maker and remained loyal to the company throughout his entire career apart from war service. He spent most of the war as a wireless instructor for native troops in India. He returned to Marconis after the war and eventually became a development engineer in the radar company. Fred was a passionate believer in right and wrong and was a devoted union representative.

He was introduced to his hobby of Amateur Radio while he was in India. He was a loyal member of CARS with a passion for construction, giving many talks and demonstrations on the subject, and always ready to help members to become proficient in that branch of the hobby. Fred had a very well equipped workshop and could turn his hand to anything as well as being a competent artist.

After his funeral and together with family and friends we were invited back to the family home by his daughters Debbie, Susan and son-in law Bob for refreshments, where we all recalled our happy memories of Fred. Fred was a devoted father, grandfather and husband of Eileen who he nursed with passionate devotion and loving care through the last years of her life.

The huge 12 volt power unit at Sandford Mill, permanently installed in the Marconi Hut, is one of a number constructed under Fred's supervision with others owned by various CARS members. This masterpiece is surely living testament to Fred's design and construction skills.

Geoff Lovegrove, G7KLV & John Bowen, G8DET.

## Essex 2m FM Activity Day March 28

In response to the lack of activity on 2m FM in Essex, the Thurrock Acorns Amateur Radio Club decided to arrange a Saturday afternoon activity session.

The goal is to get people talking on 2 metres and also to encourage the newly licensed amateurs to join in.

• **Date: Saturday, March 28, 2015**

• **Time: 1300 to 1600 GMT**

Amateurs from across Essex should be active and the Thurrock Acorns will be operating using their club call G4HKO.

Additionally, amateurs in other counties are planning to put out CQ calls on 2m FM during the afternoon and it is hoped to get as many people on-air as possible.

Further information is available at <http://www.essexham.co.uk/news/essex-2m-activity-mar-2015.html>

**Trevor M5AKA**

## Cars Skills Night – March 2015

Monday the 16th of March saw an excellent turnout with 65 people attending CARS Skills Night at Danbury Village Hall. Topics included:-

- |   |  |
|---|--|
| <input type="checkbox"/> Antennas & ATUs            | <input type="checkbox"/> Morse Arduino & Logging |
| <input type="checkbox"/> Satellites                 | <input type="checkbox"/> SSTV and SDR Demos      |
| <input type="checkbox"/> March-20 Solar Eclipse     | <input type="checkbox"/> Essex CW Club           |
| <input type="checkbox"/> Radio Programming          | <input type="checkbox"/> Quiz - very testing!    |
| <input type="checkbox"/> Construction & Patch leads | <input type="checkbox"/> CARS Membership         |



*Peter, M0PSX giving an overview of this month's features*

Skills Night isn't just CARS - as Essex CW, Essex Repeater and other clubs/members come to visit to offer advice, socialise etc.

The quiz was hosted by Clive G1EUC, including some topical questions related to Easter, band plans and the Raspberry Pi

Another busy evening, and a very successful Skills Night. The next Skills Night takes place on Monday the 20th of April.

More photographs and information [here](#).

## British Science Week Sat 14-Mar-2015, 10am-4pm Sandford Mill

www.chelmsford.gov.uk/sandfordmill



### British Science Week at Sandford Mill

Sat. 14 March 10am-4pm

Hands on activities including: circuits, bridge construction and catapult building. Displays from Chelmsford Society of Model Engineers.

PLUS industrial heritage collections and amateur radio.

**ADMISSION FREE**

Sandford Mill, Sandford Mill Rd, Chelmsford CM2 6NY 01245 475498



CARS was at Sandford Mill on Saturday 14th March as part of "British Science Week". Most activity was in the 2MT Hut where the club's FT-847 was operating and over 150 QSOs were made during a very busy and sunny day. The CARS RF-Space SDR-IQ receiver and HDSDR software was also part of the visual attractions for visitors.

Demonstrations included showing different signals on the frequency spectrum, decoding Morse Code visually plus a chance to play Charlie M0PZT's "Morse Mouse" game - this appeals to not only the youngsters, but also those who may have let their CW speed lapse.

*The SDR display and Charlie, M0PZT's Morse Mouse game*



*The Mouse game uses a Arduino-Uno controller and Morse key (Photos by Charlie M0PZT)*

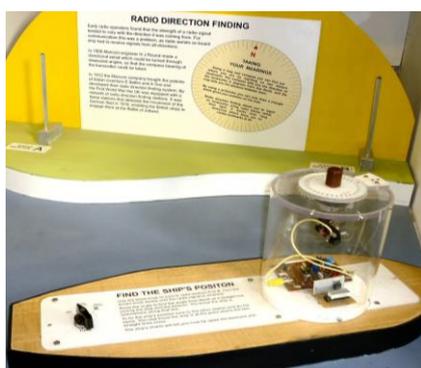
Most operating was on 40m. James 2E1GUA our event coordinator ended up with an overall total of 150+ QSOs. and the new club headphones proved helpful. Brian M6UHN took to the microphone in one of his first HF outings since getting his licence. Dorothy 2E0NCE also had a go which added to the pile-up of people wanting to work us. Other visitors who operated included Peter Onion G0DZB who contributed 13 QSOs to the overall total.



*Peter G0DZB operating*



*James 2E1GUA & Dorothy 2E0NCE operating (photos by Essex Ham)*



In addition to its historic exhibits, the museum has a number of hands-on educational items for both children and adults. Geoff Lovegrove G7KLV who is both a CARS Member and a Friend of the Museum created this one shown left, for showing how a directional antenna can help triangulate a ships position from a pair of radio beacons.

*Hands-on model to demonstrate radio direction finding (Photo by Murray G6JYB –*

### ISS Amateur Radio STEM Opportunity

Astronaut Tim Peake KG5BVI has issued an invitation to UK students to contact him via amateur radio whilst he is in space.

Tim will launch to the International Space Station (ISS) in November of this year and will spend 6 months working and living on the ISS. Ofcom has issued the callsign GB1SS for amateur radio operations on the space station and Tim will use it when he is talking to UK students via scheduled amateur radio contacts.

Last year Tim trained to use the Ericsson 144 MHz handheld radio which is installed in the Columbus module of the ISS. At the time he said "Will be great to chat with schools next year from space using this ham radio on board the ISS."

The selected UK schools/organisations will host a direct link-up with the ISS during a two-day, space related Science, Technology, Engineering and Maths (STEM) workshop.



The students taking part in the link-up will have to obtain their Full amateur radio licence to be eligible to operate the radio and one lucky student at each of the selected schools will be responsible for making contact with the ISS.

*Above - Tim Peake KG5BVI training on ISS amateur radio equipment*

The RSGB will assist schools taking part in this programme by providing training courses to help students obtain their amateur radio licence and, in partnership with ARISS, will provide all necessary technical support.

The opportunity to be involved in this exciting project opened 20 March 2015. Eligible institutions are invited to apply in order to register their interest.

Further details and a video are at <http://amsat-uk.org/2015/03/20/tim-peake-uk-students/>

**Trevor, M5AKA**

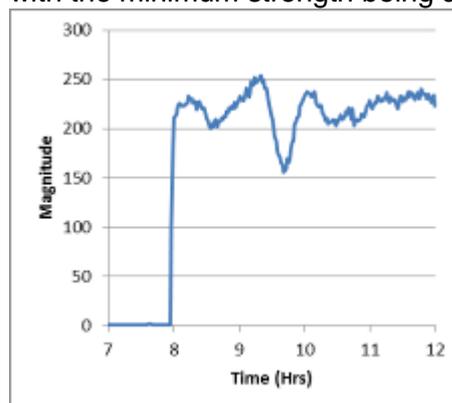
### CONGRATULATIONS

Congratulations to Rob, M0KCP, and to Steve, G4GHO, who have just passed their 25 wpm and 20 wpm respectively, RSGB morse test.

Classes will resume at Danbury village hall again on Thursday, April 16th. **Andy, G0IBN**

### Essex Partial Solar Eclipse - Results

Although it was totally cloudy in Chelmsford during the eclipse, a dip in the 23.4 kHz VLF signal from the DHO38 transmitter in German was detected. This is shown in the plot below. One characteristic of DHO38 is that the transmitter is switched off for an hour between 7 and 8 am. Around the time of maximum eclipse there was a symmetrical dip in VLF signal strength. The start and end times of the dip were 09:22 and 09:59 UT with the minimum strength being at 09:41 UT.



The minimum strength time did not correspond to maximum eclipse here at the receiver (09:31 UT) but to the maximum eclipse time at the transmitter site near Rhauderfehn, Germany at 09:41 UT. The average of the start and end dips times is also 09:41 UT. I'm not sure why this should be the case, as I expected the minimum time to correspond to the mid-point between here and the transmitter.

**Peter, M0ZBU**

### Fred Leach G2HNF Silent Key Sale.

2m 25W multimode, ICOM, IC-275A/E,	£200
HF 25W TX/RX Trio-K'wood, TS-120V	£100
HF 100W TX/RX, Trio-K'wood, TS-430S,	£250
Morse Key Marconi	£35
Morse Key AM D	£35
HF Vertical. Aerial Hustler 6BTW	£100

### All open to Near Offers

For further detail of these and other items contact Geoff G7KLV on 01245-473822 or [geoffrey.lovegrove@sky.com](mailto:geoffrey.lovegrove@sky.com)

### Firing-up that old radio.

Recently, I offered to help Oliver, M0WAG, to get going a splendid old Eddystone 840C Communications Receiver. The main problem was that the previous owner had removed the BFO coil and its associated components; no idea why. Fortunately the coil was still available, but Oliver was concerned that the electrolytics might explode after years of sitting on the shelf.



He arranged to borrow a Variac (see *left*) from Dave G3SVI, so that he could wind up the mains slowly.

On asking John G8DET how to contact Dave, John asked if I'd considered the old technique of powering up the radio via a light bulb, to limit the current



(see picture above showing John's device).

I hadn't, but impatient to get on with things I decided to give it a go. John said he usually used a 20W bulb for four days! I looked at [www/vintage-radio.com](http://www.vintage-radio.com) which gave recommendations for starting up an old radio, and which components are likely to need changing, and they also suggested the series lamp method, using a bulb of equal wattage to the radio.

In the end I used a sequence of bulbs, and measured the resulting mains voltage on the radio. A 15W bulb gave me 40V, 40W was 115V, 60W was 150V with 70V DC on the HT line, and a 100W bulb gave me 185V mains with 96V HT (normal HT is 115V). The theory is that a prolonged period on lower voltage gives the electrolytic capacitors a chance to 'reform' without blowing-up, but the technique isn't foolproof.

While the radio was working on low voltage the series light bulb glows gently, but I noticed it took some time before it glowed at all. I realized that if the volts weren't being dropped across the lamp they must be being dropped across the radio, and so it was. The lamp resistance is low when it is cold, and while it is heating up, full mains appears across the radio, so any capacitors across the mains input (common on AC/DC sets) get the full mains treatment. However, nothing blew up on the Eddystone and it is now working.

**John Roe, G4IMS**

## **Presidential Jottings**

Just a short note this month. With the improving weather it is time to venture into the garden and carry out some work on the aerials.

Our talk last month was a great insight into the GB3VHF beacon, silly me I still thought the beacon was located at Wrotham hill so it was a shock to discover it had move a good few years ago to a new site.

Thanks must be given to James 2E1GUA and Charlie MOPZT for organising our two stations for part of the Science Week activities. Thanks also must go to all the club members who came and offered support as operators or hosts.

Our next meeting at Oaklands Museum is about the Raspberry Pi and it has been decided to offer a Raspberry Pi as one of the raffle prizes. So I hope this meeting will be well supported it should be very interesting evening.

**Carl, G3PEM**

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### **Free to a Good Home**

XP 2.6 kW Mains Welder  
80-100 Amps. Heavy  
Buyer Collects. Danbury  
Stan Atkins; Phone 01245 223992

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### **A plea from the editor!**

My seasonal work for an examination board starts in May and thus I will only have limited time available for the production of the newsletter during May & June.

Therefore I would be grateful if any articles sent could be formatted in Arial font, size 11 point, left justified, single line spacing and open punctuation with the return key only used for paragraph spacing. The easiest way to do this is to use a word processing program and send the article as an attachment NOT in the main body of an email message.

This will save me a lot of time that is usually spent in reformatting and I would also be grateful if articles were sent rather than references to websites requiring extraction and reformatting.

**Alan, G0RTH**

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***Closing date for items in the next Newsletter –  
Friday 24th April.***

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