

The newsletter of the  
**Crystal Palace Radio & Electronics Club**

Affiliated to the Radio Society of Great Britain

Meetings are held on the first Friday of each month.

The room opens at 7:30pm for an 8pm start at:

All Saints Parish Church,  
Beulah Hill, London, SE19 3LG  
(opposite the junction with Grange Road).

Visitors are always welcome.

Web sites: Club: <http://www.g3oou.co.uk/>  
Technical: <http://www.qsl.net/g3oou/>  
Club Net: Each Wednesday at 20:00 on FM on 145.525MHz (S21) ± QRM  
Twitter @BobFBurns or [www.twitter.com/bobfburns](http://www.twitter.com/bobfburns)

Next meeting: 2<sup>nd</sup> June 2017

## Sub-sea Telegraph Cables at Enderby Wharf by Richard Buchanan

In this issue: *Future & Most Recent Meetings, Club Membership, A Little Light History by 'Theorist', Technical Snippets, Noticeboard, Diary of External Events, News from other Clubs, Local Training Courses and Club Contact Information.*

## Dear Reader

I attended the funeral of Frank Springate G3BWV (1922 – 2017) on 28 April with some twenty of Frank's friends and family at the Beckenham Crematorium.

Frank, who served in the army during WWII and then worked in a variety of positions up to a contracts manager, was a lifelong amateur radio enthusiast with a particular interest in Morse.

I spoke to both of his daughters who sent their thanks to club members for their help in clearing and selling Frank's radio equipment. They have offered to scan in photos of some of Frank's early radio stations for publication in this newsletter.

Graham M0GTC emailed in recently, recalling that Frank had taught him Morse many years ago.

Bob G300U

## Future Club Meetings and Events

02 Jun	M	Sub-sea Telegraph Cables at Enderby Wharf by Richard Buchanan
07 Jul	M	GPS by Nick Stapley plus another short talk to be advised
04 Aug	M	Summer Social
01 Sep	M	Antenna Modeling by Quin Collier
06 Oct	M	SDR Without Maths by Alan G0TLK
03 Nov	M	Millimetric Microwaves – Chris G0FDZ
01 Dec	M	Christmas Social
05 Jan 18		TBA
02 Feb 18	M	Annual General Meeting

C = Contest, Co = Committee meeting, E = External event, M = club meeting, R = Rally, T = Training course, V = Visit.

### 02 June 2017 - Sub-sea Telegraph Cables at Enderby Wharf by Richard Buchanan

Richard Buchanan has worked at STC, most recently at the Enderby Wharf site, and is now a member of the Enderby Group who wish to preserve a memory of Sub-sea Communication Systems manufacture - a most important business in the commercial and economic life of Greenwich.

Richard will talk about the Enderby Wharf site from its heyday when it was the site of the Telegraph Construction and Maintenance Company (Telcon) in Greenwich to its close.

The company had been formed 150 years ago in 1864, and was the first to make a successful trans-Atlantic telegraph cable in 1866. It remained the principal sub-sea telegraph cable manufacturer in the world, despite competition, until the mid-20<sup>th</sup> Century.

## Recent Event News

### 30 April 2017 Kempton Park Rally

We booked two tables at this event to sell a lot of equipment that had been donated or left over from the clearance of Frank Springate's shack. Overall the results were good with both Racal RA17 receivers, a Vibroplex (Bug) Morse key, el-bug paddles, the three Watkins Johnson units and a selection of small items being sold with a very useful contribution to club funds. The stand was manned by Alan G8NKM, Mike G4AHT (one of Alan's friends), Damien 2E0EUI and Bob G300U.

It appeared that attendance at this event was slightly down on previous years. However, there was a good selection of equipment and components on sale.

### 05 May 2017 - One Route Through Product Design - Part 1 by Bob Burns G300U

This illustrated talk consisted of:

a) An opening part looking at

- the typical processes and groups of people involved in commercial product design
- the importance of separating out the Level One "What will it do" (the user specification) from the Level Two and onwards "How will it work" (the technical specification)
- the general principles of design
- a typical route map covering all of the design, build and test processes
- A more detailed presentation on the Level One requirements
- Some basic Level Two examples specifically related to electronic design

b) A brain storming session by the audience in which three teams looked at specifying a product of their choice which could become a future club project. The topics chosen by each team were a receiver, a power supply and an aerial. The design specs will be reviewed and published in a future newsletter.



If any of these are of interest to a sufficient number of club members then part 2 of this talk would deal with how to approach creating the technical specification followed by the appointment of a project leader and a small sub-committee to complete the design phase. The important issue here would be to regularly communicate progress with club members.

We welcomed two members from Sutton & Cheam Radio Society.

### **Mechanical Snippets - Alan's Cupboard.**

The wheel seems to have turned a full circle. My introduction to the club came when Cerie Stone asked me to give a talk about the nature and properties of wood. Now the subject has arisen again when I was talking to Alan about his newly made airing cupboard doors.

Note "airing cupboard" - that complicates things. One problem with timber is that it is never the same dimensions or shape at differing temperatures and moisture conditions. An airing cupboard is subject to large temperature fluctuations and the contents can be emitting quantities of water vapour.

All one can do is to get the wood acclimatized to its intended location for as long as possible before work starts, but for how long? When I boarded our loft floor I left the boards in the house for a few days before laying them and I also measured and recorded the width of an off-cut just out of interest. It started at 144 mm wide. Below is a table of width against time :-

Width in mm	Time
144	0 days
141.5	2 days
140.75	4 days
140.2	5 days
140.0	7 days
140.0	9 days
139.5	12 days
139.5	15 days
139.0	7 years.

Plotting this out comes to a quite smooth curve. As you'll see the sample spent almost seven years kicking about after the initial 15 day trial. It was on a bookshelf in my study gathering dust. I wanted the boards to seal the rockwool insulation that I'd laid between the joists underneath. One way of achieving this would be to use tongue and groove boarding but this is more expensive than the plain square edged.

This would allow a bit of movement in the boards without letting the rockwool dust get through, at least until the tongues got stuck in the grooves and break off. Instead I used a product called Draughtex Floorboard Insulation. They are at Alford Lincolnshire ( 0800 088 7311 ) This is a quite firm sponge rubber like material sold in three different diameters. 2, 4 and 6 mm if my memory serves on 40 m rolls. It comes with a neat little roller which pushes the product down between the boards so that it doesn't stand proud of the surface. The floor has now been in place for seven years with no problems. I suppose that I should add that I have no connection with this firm but if they would like to slip me something in a

plain brown envelope for mentioning them I wouldn't say no.

Bob tells me that that he had shrunken floor boards when he moved into his present house. He got over the problem by un-nailing them all and moving them closer together and so closing the gaps and re-nailing them after adding a make-up piece. (Best to screw down upper room floor boards rather than nailing them for fear of bringing down the ceiling below with the hammering). This was successful because the house was already decades old and the boards dry. However this method can lead to trouble. I know of a pub in Croydon where they had a dance floor which was very tightly boarded and polished to a fine finish. All was well until a water tank sprung a leak and the floor got a soaking. I saw it some days later and it would have made a skate board park. The amplitude of the waves was a good six inches so one mustn't forget that timber can swell as well as shrink.

I hope my findings on shrinkage are of use to anyone thinking of boarding a loft or laying a floor of any significant size.

73, Jim. 2E0JFL

### **A Little Light History by 'Theorist'**

Ex-chairman Jim asked me what radio waves were made of, and I told him that they are made of photons. Indeed all electromagnetic radiation – radio, visible light, x-rays, gamma rays, UV, infrared etc – consists of photons, the 'particles of light'.

Newton had said that light was made of particles, although try as he might he could not fully explain some phenomena such as diffraction. In the 19th century it was thought that Newton was wrong, and based on experimental evidence it was then accepted that light was made of waves. However it was also felt that waves had to travel *in* something that could oscillate or vibrate – a medium of transmission. Water waves travelled in water, and sound waves travelled in air for example. If light was a wave then light waves also had to travel in something.

In the absence of any obvious medium, one was invented, and was called the 'luminiferous aether', luminiferous meaning light-bearing, and aether sometimes spelt as 'ether'. Light waves were thus a vibration in/of the aether. Since stars were visible, the aether had to fill the entire universe, including the empty space between the stars, otherwise their light could not reach us. Since stars were also very distant, yet could be seen very clearly and easily, the aether had to be perfectly elastic, otherwise the light waves would damp down with distance in the same way that sound and water waves disperse and dampen with distance.

Also, when the properties of hypothetical perfectly elastic materials were investigated, it turned out that they would have to have no mass, and hence have zero density. In other words the aether was a massless, dense-less, and perfectly elastic substance of some sort that filled the entire universe. Um mm. Sounds a bit dubious doesn't it?

In the meantime James Clerk Maxwell had unified electromagnetic theory in a set of four equations. As part of his work, Maxwell had been able to show that self-sustaining electromagnetic waves could exist, and remarkably had been able to calculate their speed of propagation. It turned out to be the speed of light, cementing the idea that light was an electromagnetic wave. Although in theory self-sustaining, it seems that everybody (including Maxwell) still assumed that some sort of transmission medium was needed like the aether. Old ideas persist for a long time.

One of the most famous experiments in science is called the Michelson-Morley experiment. Without going into details, this experiment performed in 1887 effectively killed off the idea that the aether existed. However it also raised other, and new, questions which were only properly explained by a certain Albert Einstein in two of the three great papers he published in 1905. In one, he drew on an earlier idea of Max Planck who had explained some important problems by assuming that energy came in small packets called quanta, without really believing in them. Einstein applied Planck's ideas to light in order to explain the 'photoelectric effect' discovered by Hertz.

Hertz had observed that light above a certain frequency could knock electrons out of a metal or other material, a different frequency for each substance. Even a weak source of light could do this, if above the frequency. Yet light below this frequency, no matter how intense, could not release photo-electrons, as they are called. Einstein decided that light energy was carried in discrete quantum packets – photons. The energy of a photon would be related to the frequency as suggested by Planck, so that the higher the frequency the more energy there would be in the photon. The governing equation is  $E = hv$ , where  $E$  is the energy of the photon,  $h$  is Planck's constant, and  $v$  is the frequency.

The discovery by Hertz was explained by Einstein by assuming that it needed a certain energy to knock electrons out of a material. If a photon had enough energy it could knock an electron out of something. If it did not, it could not. It is a bit like a coconut shy – If you only have ping-pong balls to throw at the coconut it doesn't matter how many you chuck at it, it will stay put. Yet one well aimed cricket ball will do the job nicely.

When you transmit a radio signal you are not really sending out a wave. You are sending out a

stream of photons, which in bulk act like a wave, just as the motion of a huge number of water molecules acts as a water wave. What a radio wave model regards as a varying signal amplitude is in fact a varying number of photons being transmitted. A strong signal has more photons in it than a weak one of the same frequency.

To finish, using the equation given earlier, it is easy to estimate the number of photons emitted by an old fashioned 100 W light bulb. It is about 300,000,000,000,000,000,000 per second. I leave it you to prove it.

### **Technical Snippets**

Diode detectors have a very non-linear response just above the threshold of conduction and below that point do not conduct at all. The typical conduction threshold is about 650mV for silicon diodes, 400mV for Schottky diodes and 100mV for germanium diodes.

When used in a crystal set we rely on the voltage step up in the tuned circuit to provide sufficient signal level to enable diode conduction and high impedance headphones to minimise the amount of current required to make the detected signal audible.

There are two ways to improve this conduction threshold:

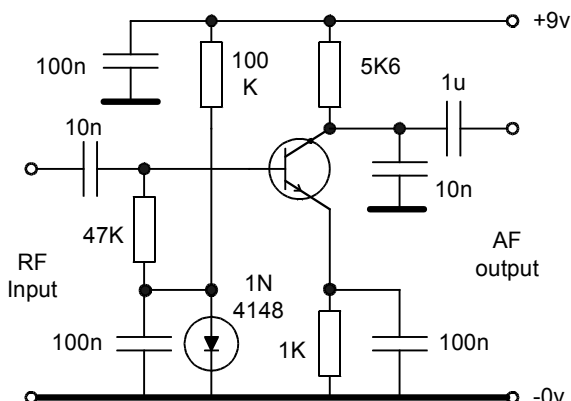
- Apply a small amount of DC forward bias to the detector diode which will increase the signal sensitivity. This is best achieved by using a second diode of the same type to act as a low voltage 'zener diode' and a current limited DC source to bring the first diode to the threshold of conduction. This circuit will be more sensitive but still have the non-linearity issues.
- Include the detector diode in the negative feedback loop of an operational amplifier (op-amp). This will require a second diode of the same type and the op-amp must have adequate gain at the required frequency. This circuit significantly reduces the diode non-linearity but performance will be limited by the op-amp frequency response. The LM318 op-amp has 30dB gain at 1MHz and will provide adequate results on the long and medium wave bands.

Another alternative is to use a transistor biased just into conduction as:

- an emitter follower (infinite impedance) detector which has current gain but unity voltage gain and is able to drive lower impedance loads.
- a common emitter stage (a.k.a. a collector bend detector) which provides both current and voltage gain, thereby increasing the overall sensitivity.

## Active Detector Circuit

The following AM detector circuit uses a transistor which is just biased into conduction using the 1N4148 as a 700mV temperature compensated bias source.



Detected audio may be taken from the emitter or the collector. The emitter decoupling capacitor should be selected to decouple the incoming RF signal but not have any effect on the detected audio and the same applied to the collector decoupling capacitor.

As shown, the detected signal will be amplified by approximately six times by the time it reaches the collector. The DC emitter voltage will increase in a positive direction and the DC collector voltage will decrease in proportion to the incoming signal level. With suitable filtering these voltages could be used to provide a simple automatic gain control.

The transistor should have an Ft many times higher than the proposed operational frequency. The emitter and collector should both be decoupled at RF.

Next month we will look at using an integrated circuit as an AM detector.

## A Little (Radio) Flutter At Kempton – The QYT KT-8900D

While at the Kempton Rally on Sunday a Chinese radio caught my eye across the isle from the club tables. I did try to resist, but eventually I ended up bringing home a QYT KT-8900D transceiver.



The QYT is a Dual Band Quad Watch Transceiver (see spec below)

## Features & Functions

- Frequency Range: VHF 136-174MHz UHF:400-480MHz
- Output Power: VHF 25Watt, UHF 20Watt
- MSK/5Tone/2Tone/DTMF/CTCSS/DCS
- Optional signal setting
- FM Radio Function
- PTT ID
- Auto Lock
- Remote stun
- Remote Kill
- Channel Name set
- 200 Channels
- Channel Spacing: 25KHz 20K 12.5
- Frequency Stability: 2.5ppm
- Operating Temperature: -20°C ~ + 60°C
- Operating Voltage: 13.8V DC ± 15%
- Dimension (HxWxD): 103(W)\*47(H)\*126(L)
- Weight (with bracket): 1kg
- Receiver
- Sensitivity: 0.25V / 0.35V
- Channel choice: ≥70dB / ≥60dB
- Intermodulation: ≥65dB/≥60dB
- Inter-modulation Rejection: ≥60dB/ ≥65dB
- Spurious Rejection: ≥70dB / ≥70dB
- Audio Distortion: ≤5%
- Audio output power: ≥2W@10%

Now this radio is tiny, but don't let that fool you as it is just amazing value for money at around £75-£85.

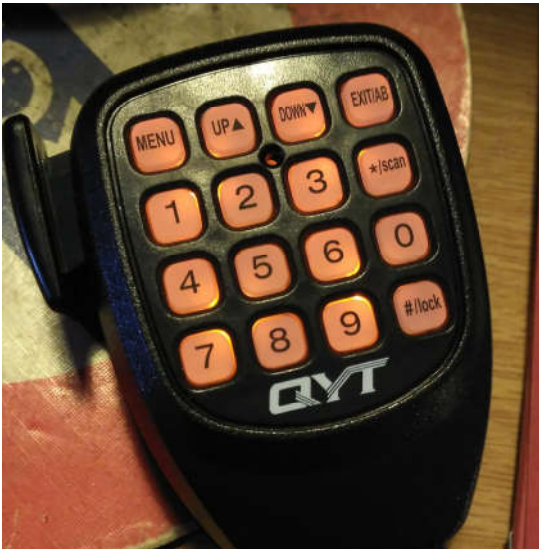
As you can see from the images below the radio is tiny (hence £2 coin for scale) but it is great to use. I have had nothing but good audio reports while using the KT-8900D on low power (10W) into local repeaters and on 2m simplex channels. Now I had been looking at this little gem for a while, and not just for its small form factor, but more for the quad watch feature which allows you to monitor 4 frequencies from your programmed channel lists. This radio will then lock onto any signal on one of your four chosen frequencies when a signal is received (I say one as this radio has a single receiver) and switch accordingly when a signal drops. The built in speaker is nice and clear, and the radio is powered with a supplied 12v cigarette lighter adapter.



The image below shows the radio in Quad watch mode.



The supplied software that comes with the radio is usable, but to be honest is pretty awful. Luckily the KT-8900D is supported in CHIRP, and this is a charm to use. I should also mention that the radio is fully programmable from the supplied DTMF microphone (see below)



You can also modify and change the look of the front screen by changing background, foreground and font colors.

I'm really enjoying using this radio as it is great fun to use, and is very portable indeed, be it in the shack or in the car. I am sure that like a lot of these Chinese radios the front end and filtering won't be as good as in its bigger and more expensive cousins, but it is fun.

73 Damien 2E0EU1

### **Notice Board – Wanted and For Sale**

The Notice Board is for all club members to use so if you have one or more items that you wish to buy or sell then please send in the details. The current list of items may be viewed at: <http://www.g3oou.co.uk/> in the "Notice Board – Wanted and For Sale" section.

#### **For Sale**

- Precision permeability tuned solid state VFO with built-in reduction drive, 7.6 - 8.8MHz £75. A photo may be seen at <http://www.qsl.net/g3oou/pto.html>
- 1.4MHz crystal filters, one each for USB & LSB, all tested, £15 each
- Pye 455KHz LC filter, 15KHz wide, £3

All excl P&P. Contact Bob G3OOU on 01737 552170 or email [g3oou\(at\)aol.com](mailto:g3oou(at)aol.com)

- Acer 19" - VGA and DVI inputs tested at 1280 x 1024 - £15
- IBM 17" - VGA and DVI inputs tested at 1280 x 1024 - nice stand - £15
- AOC 17" - VGA inputs tested at 12080 x 1024 - £15
- DIX 19" - VGA input, Wide screen, tested at 1440 X 900 - menu button problem but works ok £10.

All excl P&P. Contact Alan G8NMK on 020 8778 9660 or email [alan.odonovan\(at\)btinternet.com](mailto:alan.odonovan(at)btinternet.com)

- Kenwood TS590S as new, box, Mic, Lead & Manual £725
- Kenwood TS940S, box, mic, lead & manual £425
- Yaesu FT897 with box, mic, lead, manual & dust cover £495
- HF2V 80m/40m vertical aerial, new £325
- Two new 60ft telescopic masts £100 each or £180 the pair
- Collins KWM2A with PSU and 3182-5 VFO in Samsonite cases - £offers?
- Collins 30L1 linear (wired for 110V AC but simple rewire for 230V) £450
- Cushcraft A3WS 12m/17m 3 el beam £100
- Yaesu FT950 with mic, lead manual and box (not original) £595
- Create RC5-1 rotator new and boxed £405 plus MC2 mast clamp £75
- 30ft Versatower plus ground post £180
- 20A (?) Variac (heavy) £45

Contact Robin G3NFV on 01372 372587 and leave a message or [robin@sycomcomp.co.uk](mailto:robin@sycomcomp.co.uk)

CPREC has a large bank of fundamental and overtone quartz crystals, from 1.0 – 99.91MHz. The list has now been updated, sorted in frequency order and placed on the club web site notice board. Prices are £1 each to club members and £2 each to non-members, both plus P&P.

73

G3OOU

### **Diary of External Events**

#### **3/4 June 2017 - RSGB National Field**

HF CW contest with sections for QRP Portable, Low Power Unassisted Portable, Low Power Assisted Portable and Fixed stations. See <http://www.rsgbcc.org/hf/rules/2017/mfd.shtml>

<b>11 June 2017 - East Suffolk Wireless Revival (Ipswich Radio Rally)</b>
New venue: Kirton Recreation Ground, Back Road, Kirton. IP10 0PW just off the A14. Opens 9:30, free car parking, entry £2. Trade stands, car boot sale, Bring & Buy, Special interests groups, GB4SWR HF station and RSGB bookstall. Catering is available on site. Contact Kevin, G8MXV,0771 0046 846 [www.eswr.org.uk]
<b>18 June 2017 - 30th Newbury Radio Rally</b>
Newbury Showground, next to Jcn 13 of M4, Berkshire. Free parking on site, entry £2.50 or £12.30 for those in the car boot area. There will be an amateur radio station on display, exhibits, special interest groups, clubs and societies. On site catering and disabled facilities. Open to sellers at 8am and to the public from 9am. Advance bookings (with discount) can be made via <a href="http://www.nadars.org.uk/rally.asp">www.nadars.org.uk/rally.asp</a>
<b>14-16 JULY 2017 - Ham Radio Show, Friedrichshafen</b>
Messe, Friedrichshafen, Germany. Trade stands, special interest groups and IARU Member Societies all have stands in the main hall. Large flea market. Lectures take place each day, some in English. There will be a large RSGB book stall. [www.hamradio-friedrichshafen.de].
<b>16 JULY 2017 - MCMICHAEL RALLY</b>
Reading Rugby Football Club, Holme Park Farm Lane, Sonning Lane, Sonning on Thames, Reading RG4 6ST Talk in on S22. Opens 9.30am, entry £3. Tables and car boot spaces are £10. Details, by email, from <a href="mailto:m5alg@radarc.org">m5alg@radarc.org</a> or [www.mcmichaelrally.org.uk]
<b>29-30th SEPTEMBER 2017 – NATIONAL HAMFEST</b>
Newark & Nottinghamshire Showground, Lincoln Road, Winthorpe, Newark, Nottinghamshire NG24 2NY. Brought to you by the RSGB in association with the Lincoln Short Wave Club. Free car parking and disabled facilities. Trade stands, a Bring & Buy, car boot area, flea market, special interest groups and RSGB bookstall. There will also be representatives from the RSGB Services and committees. Morse proficiency test will be available. The venue has catering outlets and a seating area. [www.nationalhamfest.org.uk].

#### News from other Clubs

**Club Secretaries** – please send your meeting programs to our newsletter editor Bob G3OOU. This newsletter is published about ten days before our club meeting and closes for editorial contributions a few days before publication. Due to differing publication dates and short lead times it is sometimes difficult to include other clubs' specific events although we will endeavour to do so if advised in time.

If you plan to visit one of these club meetings please check with the club concerned in case of any last minute changes.

<b>Bredhurst Receiving and Transmitting society</b>
Meet on Thursday night from 8:30pm at the Parkwood Community Centre, Long Catlis Road, Rainham, Kent, ME8 9PN. Contact <a href="mailto:secretary@brats-gth.org">secretary@brats-gth.org</a>
<b>Bromley &amp; District Amateur Radio Society</b>
Meets at 19:30 on the third Tuesday of each month at the Victory Social Club, Kechill Gardens, Hayes, Bromley, BR2 7NH. Contact Andy G4WGZ on 01689 878089 or <a href="mailto:enquiries(at)bdars.co.uk">enquiries(at)bdars.co.uk</a> . Web: <a href="http://www.bdars.co.uk">www.bdars.co.uk</a>
20 Jun Direction Finding Evening by Steve 2E0DIZ

18 Jul Morse Code by Graham G4NPD
<b>Chelmsford Amateur Radio Society (CARS)</b>
19:30 on the first Tuesday of each month at Oaklands Museum, Moulsham Street, Chelmsford, Essex, CM2 9AQ. Contact: <a href="mailto:secretary(at)g0mwt.org.uk">secretary(at)g0mwt.org.uk</a> Web: <a href="http://www.g0mwt.org.uk">www.g0mwt.org.uk</a>
06 Jun "Table Top Sale"
04 Jul "Three Short Talks"
01 Aug "Constructors Competition" - CARS Members
<b>Coulsdon Amateur Transmitting Society (CATS)</b>
8:15pm on 2nd Monday each month. Contact: Andy Briers G0KZT on 07729 866600 or <a href="mailto:secretary(at)catsradio.org">secretary(at)catsradio.org</a> . Web site: <a href="http://www.catsradio.org/">http://www.catsradio.org/</a>
08 Jun TBA
<b>Crawley Amateur Radio Club (CARC)</b>
Every Wednesday 20:00 – 22:00, every Sunday 11:00 – 13:00. Formal events are on the last Wednesday of the month, 7-30pm for 8pm. Phil M0TZZ on 07557 735265 or <a href="mailto:secretary(at)carc.org.uk">secretary(at)carc.org.uk</a> or Web: <a href="http://www.carc.org.uk/">http://www.carc.org.uk/</a>
28 Jun Talk by Nick, G3RWF, RSGB President
<b>Cray Valley Radio Society (CVRS)</b>
Meets at 8pm on the 1st and 3rd Thursday of each month at 1st Royal Eltham Scouts HQ, Rear of 61 – 71 Southend Crescent, Eltham, London, SE9 2SD. Contact: Richard on <a href="mailto:secretary[at]cvrs.org">secretary[at]cvrs.org</a> . Web: <a href="http://www.cvrs.org">www.cvrs.org</a>
15 Jun Annual DF Hunt – Guy G0UKN
<b>Dorking &amp; District Radio Society</b>
Meetings at 7.45pm. Contact: David Browning (M6DJB) at <a href="mailto:djb.abraxas(at)btinternet.com">djb.abraxas(at)btinternet.com</a> . Web site: <a href="http://www.ddrs.org.uk">http://www.ddrs.org.uk</a>
27 Jun Wireless, my early days by Ken Tythacott M3CFC
25 Jul South Downs evening
<b>Echelford Amateur Radio Society (EARS)</b>
Meetings on 2nd and 4th Thursdays of each month at the Weybridge Vandals Rugby Football Club. Enquiries to John at <a href="mailto:jho_g4gsc(at)btinternet.com">jho_g4gsc(at)btinternet.com</a> or 01784 451898. Web site: <a href="http://www.qsl.net/g3ues/">http://www.qsl.net/g3ues/</a>
3/4 Jun National Field Day
08 Jun CW Practice followed by Marconi's Transatlantic Experiments - Brian Hawes, G2KQ
<b>Hastings Electronics &amp; Radio Club (HERC)</b>
Meetings held at the Taplin Centre, Upper Maze Hill, St Leonards on sea, TN38 0LQ, 7pm for 7:30 on the fourth Wednesday of each month. Information from Gordon Sweet M3YXH on 01424 431909, email: <a href="mailto:sionet3344(at)hotmail.co.uk">sionet3344(at)hotmail.co.uk</a> Web: <a href="http://herc-hastings.org.uk/">http://herc-hastings.org.uk/</a>
28 Jun Talk by Rodney
23 Aug Construction Contest
27 Sep View and discuss online AR YouTube videos
<b>Hereford Amateur Radio Society (HARS)</b>
Meets on the first Friday of each month at Hill House, Newton, Nr Leominster, HR6 0PF. Contact: <a href="mailto:enquiries@hars.wagnet.co.uk">enquiries@hars.wagnet.co.uk</a>
<b>Horsham Amateur Radio Club (HARC)</b>
Meets on the first Thursday of each month at the Guide Hall, 20 Denne Road, Horsham, West Sussex, RH12 1JF. NRQ TQ172304 at 20.00hrs local time. Contact Alistair Watt G3ZBU at <a href="mailto:g3zbu(at)hotmail.com">g3zbu(at)hotmail.com</a> or <a href="http://www.harc.org.uk/">http://www.harc.org.uk/</a>
01 Jun DMR (Digital Mobile Radio) Dennis Stanton

	G0OLX
29 Jun	Thursday Evening Fox Hunt
06 Jul	Pirate Radio - Mick Senior G4EFO
<b>Mid-Sussex Amateur Radio Society (MSARS)</b>	
Meet most Fridays in the Millfield Suite, Cyprus Hall, Burgess Hill, RH15 8DX from 7.30pm till 10.00. Contact Stella on 01273 844511, M6ZRJ(at)msars.org.uk or www.msars.org.uk	
02 Jun	Construction Contest
16 Jun	Radio Night and Table Top Sale
07 Jul	Chairman's Barbeque
<b>South East Essex Amateur Radio Society (SEARS)</b>	
Contact Dave G4UVJ on: 01268 697978 or secretary(at)southessex-ars.co.uk or http://www.southessex-ars.co.uk/	
Meetings: 7pm 2nd Tuesday each month at Swans Green Hall in Hart Road, SS7 3PE.	
13 Jun	Talk with Tim Wander, author and curator of Sandford Mill.
11 Jul	Station on the Air GX4RSE from the White House
08 Aug	SEARS 35th Anniversary evening its 35 years since SEARS was formed on 18th August 1982
<b>Surrey Radio Contact Club (SRCC)</b>	

7.30 for 7.45pm on 1st. and 3rd. Mondays every Month. Contact John Kennedy G3MCX on 020 8688 3322 or secretary(at)g3src.org.uk. Web: <a href="http://g3src.org.uk/">http://g3src.org.uk/</a>	
05 Jun	Architecture and Functionality of Low Cost Digital_Storage Oscilloscopes Pat McGuinness G4FDN
<b>Sutton &amp; Cheam RS (SCRS)</b>	
8pm on 3rd Thursday every month. Contact John Puttock G0BWW on 020 8644 9945 or email info(at)scrs.org.uk Web: <a href="http://scrs.org.uk/">http://scrs.org.uk/</a> . SCRS run a practical group most Monday evenings at the Bandstead Scout Hut.	
15 Jun	The Sun & Sky – How Space Weather Affects Radio Signals – Dr Colin Forsyth. UCL / Mullard Space Science Laboratory.
20 Jul	The Icom IC7300 SDR Transceiver – Mike Davies – G0KAD
<b>Wimbledon &amp; District Amateur Radio Society</b>	
Meets on the 2nd and last Friday in the month at Matin Way Methodist Church Hall, Martin Way Merton Park, London, SW19 9JZ at 19:30hrs for 20:00hrs. Contact: Andrew G4ADM on 020 8335 3434 or andrew.maish(at)ntlworld.com	

Please replace the (at) with @ when using any email addresses shown in this newsletter.

### Local Training Courses

Licence Level	Dates	Location	Club Provider	Format	Further details
Foundation	10 & 17 Jun 2017	Sidcup	Darenth Valley	2 days (Sat)	<a href="http://darenthvalleyrs.org/">http://darenthvalleyrs.org/</a>
Foundation	17 Sep & 8 Oct 2017	Bromley Kent	Bromley & District ARS	2 days (Sun)	<a href="http://www.bdars.org">www.bdars.org</a>
Full	2, 9, 14 Oct & 4, 11, 18 Nov 2017	Eltham, SE9	Cray Valley RS	2 evenings (Mon) + 4 days (Sat)	<a href="http://www.cvrs.org">www.cvrs.org</a>
Foundation	3 & 10 Feb 2018	Eltham, SE9	Cray Valley RS	2 days (Sat)	<a href="http://www.cvrs.org">www.cvrs.org</a>

### CPREC Committee Contact Information

<b>Officers:</b>		
<b>Chairman:</b>	<b>Secretary:</b>	<b>Treasurer:</b>
Damien Nolan 2E0EUI 7 Fonthill Court Honor Oak Road London SE23 3SJ 07900 242541 Gorby928(at)gmail.com	Alan O'Donovan G8NKM 2 Mackenzie Road Beckenham Kent BR3 4RU 020 8778 9660 Alan.odonovan(at)btinternet.com	Ian Skeggs M6FZC Ground Floor Flat, 24 Kendall Road Beckenham Kent BR3 4PZ 020 8650 9049 ian.skeggs(at)btinternet.com
<b>Committee Members:</b>		
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Nick Stapley		