

The newsletter of the
Crystal Palace Radio & Electronics Club

Affiliated to the Radio Society of Great Britain
Established January 1956

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.

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|------------|--|
| Web sites: | Club Admin: http://cprec.btck.co.uk/ |
| | Club Technical: http://cprec.btck.co.uk/OurTechnicalSite |
| Email: | cprec.g2lw@gmail.com |
| Club Net: | Each Wednesday at 20:00 on FM on 145.525MHz (S21) ± QRM Experimental net each Saturday at 20:00 on FM on 51.55MHz |
| Twitter | @BobFBurns or www.twitter.com/bobfburns |

Next meeting: Friday 2nd August 2019

Summer Social, Pixie Completion and On the Air

In this issue: *Future Meetings & Events, Recent Event News, Points of Interest by 'Theorist', Technical Snippets, Members News, Miscellaneous, Noticeboard, Diary of External Events, News from other Clubs, Local Training Courses and Club Contact Information.*

Dear Reader

Future 2019 Club Meetings and Events

| | | |
|--------|---|---|
| 02 Aug | M | Summer Social, Pixie Completion and On the Air |
| 06 Sep | M | Specifying Power Transformers by Paul Dyer |
| 04 Oct | M | Emergency Service Communication by Steve Shorey G3ZPS |
| 01 Nov | M | The Gliwice Radio Tower Incident by Phil Tate M1GWZ |
| 06 Dec | M | Christmas Social |

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

02 Aug 2019 - Summer Social and On the Air

The next meeting will be our Summer Social with an opportunity to operate the club station on the HF/VHF bands and look at/finish your Pixie CW transceiver.

Please bring along a contribution of food, sufficient for yourself and any accompanying guests, which will be added to the buffet table.

Alan will bring along some tools and a soldering iron and be available to help any constructors with problems. If you would like to finish your own Pixie during the evening please bring along sufficient tools and your own soldering iron to avoid a tools queue.

Please also come along early to give a hand with setting up the aerials and radio equipment.

Recent Event News

05 June 2019 - Street Party Station

The special event station GB2QE was set up in conjunction with a street party held at Jim's (M0JFL) QTH on Saturday June 8th to celebrate the Queen's birthday. Band conditions were good and Jim's antenna was effective. The station was manned by Damien, Jim and Steve (M0PEL) and many contacts were made on 80 and 40 metres plus a number on 2m. It was successful in radio terms but the weather conditions were awful

05 July 2019 - Admiralty Signalling by Jim M0JFL

Jim's interest in this topic started around 1955/56 while attending a motorcycle which had a section labelled Telegraph Hill. A lot of information is available from two books by authors Geoffrey Wilson and Tom Homes respectively. The book by the latter



author is extremely detailed and difficult to extract summary information.

During the Napoleonic Wars in the 1700s combatants could be influenced by local Windmill blades used as signals. Similar equivalents were used by others including code flags used on ships at sea.

The Admiralty used messengers on horseback which took a lot of time and was not without risk.

The Rev George Gamble invented a frame to use with line of sight signalling with four shutters. The Rev Lord George Murray had a similar system using six shutters arranged as two horizontal by three vertical and each shutter was hinged.

The picture below shows Jim holding two models of the signalling devices.

Smog was a major problem in London so the signal path often had to start outside of London, typically at Sheerness with paths to Dover and Plymouth. These line of sight points were known as Semaphore Stations and were arranged as high as possible in a chain to their final destinations. The six shutters



each had two possible states giving a total of 64 codes, one of which had to be 'not in use'. A system of mechanics was required to control the shutters and prevent them being affected by the wind.

Each station was equipped with a good clock (costing 8gns or £8 8s), two good telescopes (costing 12gns or £12 12s each) and a staff of two signallers, one handyman and one uniformed manager (usually a lieutenant). With practice London to Plymouth could take as little as three minutes end to end. Semaphores could do about 6 - 8 words per minute.


Closer view of two shutter systems on the right.



When peace broke out at the end of the 1700s the shutter telegraph

system was abandoned. When hostilities started again, a new semaphore system was developed by Parsley using a tall mast topped by a wide slat arranged in one of four possible positions but was not very popular. A similar system developed by Popham used a tall mast containing two slats, one above the other in a similar diagonal arrangement. It was not unusual to build the shutter system on top of a cottage.

The diagram below shows one of the vocabularies that was in use:

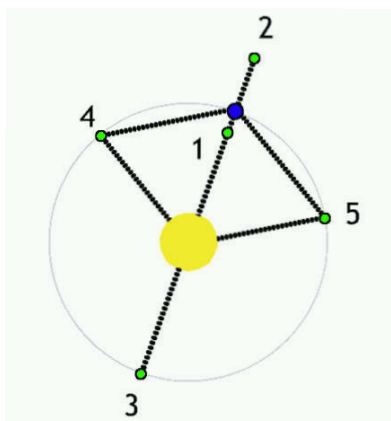
| COAST STATION VERSION VOCABULARY | | | | | | | | | | |
|---|---|----|-------------------|---|---------------------------|---|----|----------|------------|----|
|  | 1 | 2 | 1 was — No 1 Flag | | <div>Orthographical</div> | | | | | |
| | 3 | 4 | up to | | | | | | | |
| | 5 | 6 | 8 was — No 8 Flag | | | | | | | |
| | 7 | 8 | then.... | | | | | | | |
| | | | 15 was No 9 Flag | | | | | | | |
| | | | 16 | " | A | " | IJ | 35 | was H Flag | R |
| | | | 17 | " | B | " | K | 36 | " I " | SZ |
| | | | 18 | " | C | " | L | 37 | " K " | T |
| | | | 25 | " | D | " | M | 38 | " L " | UV |
| | | | 26 | " | E | " | N | 45 | " M " | W |
| | | 27 | " | F | " | O | 46 | " N " | X | |
| | | 28 | " | G | " | P | 47 | " O " | Y | |
| | | | | | | Q | 48 | " Finish | | |
| | | | | | | | | | R SZ | |
| | | | | | | | | | T UV | |
| | | | | | | | | | W X | |
| | | | | | | | | | Y | |

Popham developed a separate language for this system which provided a degree of encryption and also developed a similar system for use at sea with the two masts arranged side by side. Our modern flag based semaphore system is a descendant of this work.

Points of Interest by 'Theorist'

Imagine two large bodies in orbit around each other, the Earth/Sun system for example - which I will use as the base example throughout. Are there any points where a third body such as a satellite could maintain its position relative to both bodies without using any energy to do so? In other words where all three bodies would always have the same relationship or 'pattern' to each other? If there are then a satellite at such a position would not need any fuel to keep it where it was. The answer is yes, otherwise I wouldn't be writing this article, but I was reminded of it all recently when a new X-ray satellite was launched, the Spektr-RG.

In fact for two large bodies there are five such points called the Lagrange points after an Italian mathematician who wrote an essay about them in 1772. They are denoted L1 to L5, although as Lagrange was aware three of the points had already been identified by a great Swiss mathematician named Leonhard Euler. Just (I hope) to be clear, if the diagram to the right is rotated about the common centre of mass (inside the Sun) then as the Earth orbits/rotates so all five points retain the relationship shown in the diagram.



A semi-obvious place where this could occur would be somewhere between the two bodies on a straight line between them at L1. The further an object is from the Sun the longer its orbital period is, so an object closer to the Sun would be expected to orbit faster than the Earth. However if the Earth's gravity can reduce the effects of the Sun's gravity on an object then the orbital period of the object can be reduced. At the L1 point shown in the diagram this is precisely what happens, and a satellite at this position will maintain its relative position to the Sun/Earth system by orbiting at the same rate as the Earth. The actual L1 position is about 1/100th of the distance from the Earth to the Sun. Because it has an uninterrupted view of the Sun this point is currently occupied by the SOHO (Solar and Heliospheric) observatory, and the Deep Space Climate Observatory designed primarily to warn of solar magnetic storms.

The second point and third points L2 and L3 are also on a straight line between the Sun and the Earth but outside the smaller and larger bodies respectively. For L2 the combined gravity of both bodies combine to increase the orbital rate of something at L2 to the same rate as that of the smaller body. For L3 a similar thing happens although the orbital distance from the larger body (e.g. the Sun) is very slightly less than that of the smaller body (e.g. the Earth).

Since L2 has the Sun, Earth and Moon behind it anything placed there has a clear view of deep space, so it is currently occupied by the WMAP satellite measuring the Cosmic Microwave Background left over from the big bang, and will soon be occupied by the James Webb space telescope, the Hubble replacement, and also the aforesaid Spektr-RG. L3 has no obvious practical use although it has featured in sci-fi stories and movies as a hidden location occupied by aliens and even another 'mirror' Earth. Both L1 and L2 can use the fast conventional Ka-band for comms, if that means anything to you (it doesn't to me).

The problem with these three points is that they are points of unstable equilibrium. If a slight perturbation occurs to something at one of these points it will gradually fall out of orbit - it cannot maintain position indefinitely. Satellites at these positions therefore do need to be nudged back into position with thruster burns every now and then.

L4 and L5 are harder to understand since they lie at the corners of equilateral triangles in the orbital plane, either behind or ahead of the smaller body as it orbits the larger. They only exist though if the ratio of the masses of the two large bodies is greater than 24.96. This is certainly the case for the Sun/Earth system and also for the Earth/Moon Lagrange points. I cannot think of any simple way of explaining why these two points should be Lagrange points with the appropriate properties. However it turns out that these are points of *stable* equilibrium. What happens here is that if something gets slightly perturbed at one of these points it will swing back, adopting a sort of 'broad bean' shaped orbit around the point, but not drifting away.

Because L4 and 5 are points of stable equilibrium material can collect at these points naturally, whereas it is very unusual for that to happen at the other three points which are in unstable equilibrium. For example

the Earth/Moon L4 and 5 points contain small clouds of interplanetary dust called Kordylewski clouds that have occurred naturally. Similar clouds and at least one asteroid occupy the Sun/Earth L4 and 5 points. All the planets have similar sorts of objects at these points associated with their various moons, and so on. In the 1970s a group called the L5 Society devoted a great of effort promoting and working out the details of developing a permanent space colony at L5. I don't know why that was preferred to L4, which would also do.

An Anniversary. I missed a centenary anniversary a couple of issues ago, when the black hole picture was released and took precedence. The anniversary, which didn't seem to get reported in the press, was that of a total eclipse of the Sun on 29th May 1919 visible from the island of Principe off the west coast of Africa. The reason this particular eclipse was so important is that it was observed by Arthur Eddington (later Sir Arthur) a Professor of Astronomy at Cambridge who was intent on proving Einstein's theory of gravity called General Relativity. Einstein's theory appeared in 1915 during the first world war, meaning that it did not get the attention it would normally receive, particularly with the anti-German sentiments prevalent at the time.

As a Quaker, Eddington would not fight, but Cambridge University successfully argued that he be given an exemption from conscription. Also as a Quaker he had no problem with looking at work by a German (or anybody else) and as a first rate Mathematician was one of the few people who understood Einstein's new theory which predicted that light should be bent by gravity.

The 1919 eclipse was his first chance to test Einstein's prediction. By leading an expedition to Principe and taking pictures of stars in the area around the Sun during the eclipse he was able to show that the stars he had photographed did not appear to be precisely where they should have been. Their light had been deflected by the Sun's gravity, proving that Einstein was right.

Members News

A) New members: we welcomed Brendon Caligari M0PTP and Gary Wilson 2E0GGQ who both joined at the July meeting.

b) New PC - I have just taken delivery of a new bespoke desktop PC which has taken a considerable number of days to get configured, software installed and the contents of the backup drive restored to the correct drive volume. It uses an Intel i7 eight core 3.6GHz processor, 16GB out of a possible 32GB of RAM, 3 x 1TB hard drives and an Nvidia 4K dual monitor graphics card, all running under Windows 10 Professional. Interestingly the five internal cooling fans are barely audible and a lot quieter than the previous PC.

This exercise has involved a steep learning curve in Windows 10 and the limitations of the new hardware - for example:

- the new mouse driven UEFI BIOS does not provide for a diskette drive, serial or parallel ports so all software transfers must use USB, CD/DVD, BluRay or networking.
- The new motherboard hardware will only run Windows 10, nothing earlier, so Windows XP and

Windows 7 must be run using a virtual machine and a software virtualisation package, in this case, VMWare.

- The UEFI BIOS causes problems with Linux and the GRUB bootloader.

Ubuntu Linux installs with no major issues but the hardware is so new that there are no bespoke drivers for the graphics card yet so the screen runs at low resolution. Ultimately, after a number of trials, I installed Mint Linux which automatically runs some graphics routines using the main processor instead of the graphics processor so I am not forced to use unworkable low resolution screen displays.

The UEFI BIOS has a number of inbuilt security options which may be enabled or disabled as required. It also has a very useful option for booting from a nominated device without permanently changing the boot order.

The majority of the software and technical libraries from the previous PC have been installed and are being tested. One or two packages will not run under Windows 10 so are being migrated to the Windows 7 or XP virtual machines which can share the PC resources. The good news is that Lotus Organiser v5 that I first started using in 2000 does work under Windows 10 with no issues.

I have always formatted my hard drives into multiple volumes and never held any working data on the C drive. This enables data files to be held in related folders (like family trees) on each drive, easily located and minimises the risk of accidental deletions. For example, drive D holds working data, H holds hardware data and technical data sheets, M holds Manuals, P holds Photos etc. All folders are named with their function and the total file count currently stands at about 950,000.

There is a simple Windows batch job using XCopy which ensures that the latest version of any file is copied to an external hard drive and a separate backup process to copy files to BluRay media (25GB maximum per disk with some file compression).

The desk top publisher, web editor, Office packages and a number of the software editors and development systems including the PIC Assembler, Microsoft Access 2013, Borland C compiler and the (several) Harbour database application compilers are now up and running.

The Harbour database platforms have been developed over many years from the old dBase and Clipper platforms which were very popular in the 1970s and 80s. The dBase language is similar to BASIC and relatively easy to learn and Harbour offers both procedural and object oriented options.

Another distinct benefit is the provision of database manipulation functions within the natural language like Add, Edit, Delete, Search etc and options to connect to SQL databases using replaceable database drivers or ODBC. However, you can write programmes that do not use any database facilities if required. My Workbench program on the technical website is one such example.

Unlike dBase and Clipper which were p-code interpreters, the Harbour compiler uses an extra intermediate process to translate the source code to C/C++ source code which is then compiled and linked to form the final executable program. This makes it fast to

execute and very difficult to reverse compile back to the source code so protecting the developers intellectual property. Harbour offers both command line (DOS like) and GUI (graphical user interface) based executables that will run under 32bit and 64bit versions of Windows including Windows 10.

A simple procedural code snippet from my log keeping programme is shown below to give you a flavour of the syntax:

```
m_callsign = callsign
m_frequency = frequency
* check which data index is in use
if s_chkindx = 2 .or. s_chkindx = 4
    fill_wkd()          && populate data fields
    repaint_wkd()       && refresh the updated fields
endif
IF update_scrn
    repaint_scrn()      && refresh the entire display
ENDIF
```

Logical operators are surrounded by full stops.

Note that the 'then' clause is implied and not actually required in the If - then - else - endif code. The language is not case sensitive although it does help to use upper case to make code items stand out. Some context sensitive editors will show sections of code in different colours.

There is a source code debugger to assist with error detection and to monitor variables during program operation.

By default the contents of a Harbour database are not encrypted so if data security is required then the developer has to write their own encryption routines.

Code comments, which help in development and maintenance and are automatically ignored by the compiler, use the double ampersand (&&) to the right of a line of program code or the asterisk (*) at the start of a line.

Most of the Harbour variants are free but xHarbour does incur a small charge for personal use and significantly more for commercial use. There are a number of modern GUI based commercial dBase/Clipper variants that are not free.

If you are interested then search for Harbour, Harbour Extended, FiveWin, Visual Objects, XBase++, dBase 2019, Flagship, Xailer, FiveDBU and Marinas IDE - some of which are free, others are not. Despite its age, the dBase language is still very popular and has many extensions to make it compatible with modern GUI based operating systems and data processing requirements.

Miscellaneous

a) The ITU World Radio Conference in 2019 (WRC-19) has a number of Agenda Items that are relevant to the amateur and amateur satellite services.

Most attention by amateurs is likely to be focussed on the prospect of harmonising the 50MHz allocation, but several other topics are included which concern and potentially threaten amateur activities including new allocations for the aeronautical mobile service in the

range 144-174 MHz would extend the existing usage in the band 138-144 MHz.

After due consideration, and as reported in GB2RS news on Friday, 5 July 2019, RSGB President Dave Wilson M0OBW wrote to Ofcom strongly expressing the RSGB's concerns about the proposed WRC-23 aeronautical Agenda Item that includes 144-146 MHz.

[Source - RSGB web site]

b) Drake TR7 Transceivers: your scribe has started working on these all solid state units which were donated to the club from the estate of a deceased club member. The PS7 (13.5v 25A) linear power supply has been cleaned and tested with no detected issues. The units had been stored in a damp environment so all require a good clean. Each TR7 requires an external 13.5v 25A PSU to run at full power.



So far, the first one has come to life on receive and transmit on all bands - all contacts and connectors have been cleaned and sparingly lubricated with Electrolube. A full re-alignment is in progress with receiver sensitivity better than 1uV on all bands and 100W transmitter output on most bands with 50-75W on 21 and 28MHz which is normal for this model. AM output can be set to 30W. Transmit spurious outputs are better than 60dB below peak carrier.

There is only one linear regulated PSU available so I have constructed two new power connectors for the second TR7 for use with a different PSU. Once repairs are complete these units will be offered for sale.

b) The Museum of London in Docklands is running an exhibition entitled "Secret Rivers" which describes the rivers of London, a lot of which are now underground. This event runs until 27th October 2019.

c) The Science Museum: Marking 100 years since the birth of the UK's Intelligence, Security and Cyber agency GCHQ, the Science Museum's latest exhibition takes you on a journey through the world of codebreaking, ciphers and secret communications, embarking on the transition from ciphers to cyber security.

Running from 10 July 2019 to 23 February 2020 the 'Top Secret' exhibition explores a century's worth of communications intelligence through hand-written documents, declassified files and previously unseen artefacts from GCHQ's collections and features stories that underpin secret and secure communications in the past, present and future.

The exhibition is located in the basement gallery of the Science Museum, where visitors may also catch a glimpse of the 'Driverless: Who is in control?' exhibition on the floor above it as they walk towards the gallery. Seems rather fitting to have this particular exhibition in

the basement, with "secret bunker" connotations of its location seemingly matching the purpose of the gallery.

See:

<https://eandt.theiet.org/content/articles/2019/07/top-secret-from-ciphers-to-cyber-security-at-the-science-museum>

for more information.

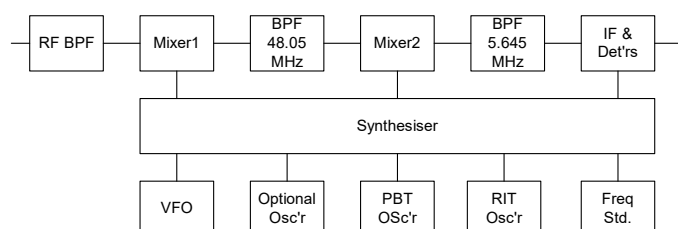
d) The RSGB Examinations Standard Committee has published their latest annual report which includes a proposal for a single examination for direct entry to a full licence. A consultation is planned for later in 2019.

<https://thersgb.org/publications/committees/esc/2019/2019-may-annual-report-of-the-rs-gb-examination-standards-committee.pdf>

Technical Snippets

a) The Drake TR7 was a high end analogue transceiver when sold in the 1980s and still perfectly usable on today's HF amateur bands. Transceiver frequency coverage is the original 1.8 - 30MHz amateur bands with additional receive coverage of the WARC bands and 5MHz - the transmitter is disabled on those bands. It may be possible to enable the transmitter on those bands but I have not researched that topic. There is no microprocessor and no hidden menus so operation from the front panel controls is straightforward.

The frequency conversion architecture, shown in summary form below, is a dual conversion superhet with fixed IFs, both containing crystal filters, at 48.05MHz and 5.645MHz. The RF signal enters on the left hand side and the final audio signal exits on the right hand side. The synthesiser output is locked to a VFO or an optional set of crystal controlled frequencies. A 40MHz internal frequency standard is used for both the synthesiser and



the six digit frequency counter.

The transmitter is the reverse of the receiver part of the above diagram and the synthesiser is common to both.

Operational modes are CW, USB, LSB, RTTY and AM. The latter is implemented by reinjecting the carrier to the SSB signal. There is no FM option.

The receiver has both pass band tuning and receiver incremental tuning and there are a set of high pass filters to reduce the effects of strong local broadcast signals.

There are a number of internal adjustments and preset controls whose operation is interlinked and their setting order is critical. The service manual contains a detailed set of realignment procedures. A full set of documents is available on the Internet including the user and service manuals and several covering updates and improvements to the original design.

A useful function is that the internal frequency counter has an external input and selector switch on the rear panel. When the external input is selected the frequency counter may be used to measure external signals up to 150MHz.

Most of the electronic components are still available so maintaining these transceivers is still possible.

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. Some of the current list of items may be viewed at:

<http://cprec.btck.co.uk/SaleofClubEquipment>

All excl P&P.

Wanted:

I have a big bundle of J-Beam elements for 2M, and a folded dipole in their style. The elements have end-caps in white (maybe yellow once upon a time), brown and black – three different lengths. As I'm missing any boom I wonder if anyone has stashed away assembly instructions for any of their 2M aerials from which I could try and replicate whatever it was, presumably 4 elements upwards. There are many multiples of each colour, but just one folded dipole. An email scan would be great or even brief details of spacing and element lengths. I have some tubing that will do for the boom, I just need to know where to drill it! Thanks. Gareth, G4XAT, [g4xat\(at\)ntlworld.com](mailto:g4xat(at)ntlworld.com).

For Sale

Two AVO 8 Mk VI test meters: One has a broken terminal the other is fine. Both working but no leather carrying cases. £55 each ono. Contact Noel Brown on 0208 761 5883.



PC with 2.8GHz quad core Athlon processor, heat pipe cooling, 600W PSU, 4GB of RAM, 1TB and 0.5TB hard drives, CD/DVD RW drive, BluRay BD-RE (25GB) drive, Windows 7 professional 64bit operating system, digital TV and FM radio card, dual monitor graphics card, Ethernet network port, 6 USB ports, legacy parallel port card, 3.5inch diskette drive and all driver software. No mouse, keyboard or monitor. Offers to Bob on 01737 552170 or [g3oou\(at\)aol.com](mailto:g3oou(at)aol.com)

CPREC has a large bank of fundamental and overtone quartz crystals, from 1.0 – 99.91MHz and the list is on the club website as a downloadable PDF file. Prices are £1 each to club members and £2 each to non members, excluding P&P. Contact Bob on 01737 552170 or [g3oou\(at\)aol.com](mailto:g3oou(at)aol.com).

73

G3OOU

Diary of External Events

18 Aug 2019 - Rugby ARS Rally

Princethorpe College, Princethorpe, Rugby CV23 9PY

Entry £3, NGR is SP395710. Open from 10am to 4pm, trader access from 8.30am. Car boot area, catering on site. Details: Steve, G8LYB on 07956 855816 or email rally(at)rugbyats.co.uk Web: www.rugbyats.co.uk

25 Aug 2019 - Milton Keynes ARS Rally

Irish Centre, Manor Fields, Watling Street, Bletchley MK2 2HX. Entrance £3. Trader options available with extra indoor pitches available for 2019. Free parking and on-site catering. Open to traders 7am, public from 9am. Additional information at www.mkars.org.uk/rally or contact Francis Hennigan, M0UKF rally@mkars.org.uk or 07563 498 156

27-28 Sep 2019 - 11th National Hamfest

Newark & Nottinghamshire Showground, Lincoln Road, Winthorpe, Newark, Nottinghamshire NG24 2NY.

Free parking. Nearest rail station is Newark where taxis are available. For more information including the flea market, bring & buy and trader list see:

<http://www.nationalhamfest.org.uk/>

11-13 Oct 2019 - RSGB Convention

Kent's Hill Park Training and Conference Centre, Swallow House, Timbold Drive, Kent's Hill Park, Milton Keynes, Buckinghamshire MK7 6BZ.

19 Oct 2019 CW Convention and CW Boot Camp

3rd Witham Scout & Guide HQ, Rear of Spring Lodge Community Centre, Powers Hall End, Witham, Essex CM8 2HE. Registration at 8.30am, start 9am. Finish at around 4.30pm. Pre-register as places are limited to G0IBN: g0ibn1@yahoo.com or 0745 342 60 87 Previous events have welcomed visitors from all over the UK.

News from other Clubs

Club Secretaries – please ensure that your future meeting details are present in your newsletters, on your websites or sent to our newsletter editor Bob G3OOU. Palace Pulse is published about ten days before our club meeting which is on the first Friday of each month and closes for editorial contributions a few days before publication. Due to differing publication dates and short lead times it is getting increasingly difficult to include other clubs' events although we will endeavor to do so if advised in time. **If we are regularly unable to obtain the information then that club entry will be removed from this newsletter.**

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

Bredhurst Receiving and Transmitting Society

Meet on Thursday night from 8:30pm at the Parkwood Community Centre, Long Catlis Road, Rainham, Kent, ME8 9PN. Contact secretary@brats-qth.org or <http://www.brats-qth.org/brats/>

25 Jul Spectrum Matters by Barry Lewis G4SJH
26 Sep The GB3VHF and GB3UHF Story

Bromley & District Amateur Radio Society

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 enquiries(at)bdars.co.uk. Web: www.bdars.co.uk

20 Aug Operating and Social Evening

17 Sep Millimetric Microwaves by G0FDZ
15 Oct DMR Hotspots - An Introduction by Damien 2E0EUI
19 Nov The Nicky TRF by M0YRG
17 Dec Quiz and Mince Pies

Chelmsford Amateur Radio Society (CARS)

19:30 on the first Tuesday of each month at Oaklands Museum, Moulsham Street, Chelmsford, Essex, CM2 9AQ. Contact: secretary(at)g0mwt.org.uk Web:

www.g0mwt.org.uk

06 Aug Constructors Competition
03 Sep Life as a Radio Officer by Dave Ellis G4AJY
01 Oct CARS AGM

Couldson Amateur Transmitting Society (CATS)

8:15pm on 2nd Monday each month. Contact: Andy Briers G0KZT on 07729 866600 or secretary(at)catsradio.org. Web site:

<http://www.catsradio.org/>

12 Aug Club Annual BBQ
09 Sep Construction evening and general chat night
24 Nov CATS Bazaar
09 Dec CATS AGM

Crawley Amateur Radio Club (CARC)

Every Wednesday 20:00 – 22:00, every Sunday 11:00 – 13:00. Formal events are on the fourth Wednesday of the month, 7-30pm for 8pm. Phil M0TZZ on 07557 735265 or secretary(at)carc.org.uk or Web: <http://www.carc.org.uk/>

31 Jul Intro to 6m by Chris Deacon G4IFX of UKSMG
28 Aug Dayton & Friedrichshafen Report by Stewart G3YSX
25 Sep Plastics in Amateur Radio - TBC

Cray Valley Radio Society (CVRS)

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 secretary[at]cvrs.org .Web www.cvrs.org

01 Aug CVRS IOTA trip report Giles M0TGV
05 Sep Dayton 2019 Highlights

Dorking & District Radio Society

Meetings at 7.45pm. Contact: David Browning (M6DJB) at djb.abraxas@btinternet.com. Web site: <http://www.ddrs.org.uk>

24 Sep Small loop antennas by Colin Berry
22 Oct Hermes Lite SDR by Alan Hopper
26 Nov AGM & film

Echelford Amateur Radio Society

Meetings on 2nd and 4th Wednesdays of each month at new venue: St. Hilda's Church Hall, Stanwell Road, Ashford, TW15 3QL. Enquiries to Phil at m1gwz(at)icloud(dot)com. Web site:

<http://www.qsl.net/g3ues/index.htm>

14 Aug Space Weather by Dr Colin Forsyth (UCL)
09 Oct Aerials, Feeders and ATUs by Bob G3OOU

Hastings Electronics & Radio Club

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: sionet3344(at)hotmail.co.uk

Web: <http://herc-hastings.org.uk/>

28 Aug Construction Contest
25 Sep Photos Presentation by Alan Harding

27 Nov Video Presentation

Horsham Amateur Radio Club

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 Alister Watt G3ZBU at [g3zbu\(at\)hotmail.com](mailto:g3zbu(at)hotmail.com) or <http://www.harc.org.uk/>

01 Aug From the Low to the Northern Countries - G4EFO / G4JHI

05 Sep Life with Auntie by Richard G3ZIY

20 Sep HARC Weekend - South Devon

03 Oct Junk Sale

Mid-Sussex Amateur Radio Society (MSARS)

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](mailto:M6ZRJ(at)msars.org.uk) or www.msars.org.uk

09 Aug Treasure Hunt with a Difference - Stella and Alan

16 Aug How I Started in Amateur Radio by David Parker

13 Sep Air Ambulance Presentation

04 Oct Talk by Chris Saunders

18 Oct Where is Radio Going by Phil Godbold

North Kent Radio Society

Meets at the Hurst Community Centre, Room 15, Hurst Place, Bexley, Kent, DA5 3LH. Doors open at 8PM. More information from Stephen G8JZT on secretary@nkr.org.uk or 07985 753370 evenings or weekends. Web: <http://www.nkr.org.uk/>

06 Aug International Lighthouses and Lightships

Event Planning

17/19 Aug International Lighthouses and Lightships Event

South East Essex Amateur Radio Society (SEARS)

Contact Mark Callow 2E0RMT on 07842 336444 or [secretary\(at\)southessex-ars.co.uk](mailto:secretary(at)southessex-ars.co.uk) or <http://www.southessex-ars.co.uk/>

Meetings: 7pm 2nd Tuesday each month at The White House, Kiln Road, Benfleet, Essex, SS7 1BU.

13 Aug Social/Radio night

10 Sep Radio Control Helicopters by Tony G0JYI

Surrey Radio Contact Club (SRCC)

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](mailto:secretary(at)g3src.org.uk). Web: <http://g3src.org.uk/>

05 Aug SRCC Annual Barbecue at G3ZPB

02 Sep Software Defined Radio - TBC

07 Oct Autumn Surplus Equipment Sale

04 Nov Inter-Club Quiz: SRCC / CATS / S&CRS

02 Dec Construction Contest

Sutton & Cheam Radio Society

8pm on 3rd Thursday every month. Contact Chris Howard at [info\(at\)scrs.org.uk](mailto:info(at)scrs.org.uk) Web: <http://scrs.org.uk/>. SCRS run a practical group most Monday evenings at the Bandstead Scout Hut.

15 Aug Heil Sound by Bob Heil, K9EID

19 Sep Introduction to Oscilloscopes, Martin Butler, M1MRB

17 Oct HMS Belfast Radio Volunteers, Jorgen Faxholm, M0AXP

21 Nov Receiving Es'hail2 by Paul Kenny 2E0PCK

12 Dec Christmas social and friendly quiz

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

Local Training Courses

Crystal Palace Radio & Electronics Club is a member of the South East Tutors training group.

| Licence Level | Dates | Location | Club Provider | Format | Further details |
|--|-----------------------|-----------------|------------------------|---------------|--|
| Please note that a new syllabus will apply for all exams from July 2019. | | | | | |
| Foundation | 22 Sep - 6 Oct | Bromley BR2 7NH | Bromley & District ARS | 2 days (Sun) | www.bdars.org |
| Full | 07 Oct - 30 Nov | Eltham, SE9 2SD | Cray Valley RS | TBA | www.cvrs.org |
| Intermediate | Feb or Mar 2020 - TBC | Bromley BR2 7NH | Bromley & District ARS | Three Sundays | www.bdars.org |
| | = course commenced | | | | |

CPREC Committee Information

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|---|---|--|
| Officers: | | |
| Chairman: | Secretary: | Treasurer: |
| Damien Nolan 2E0EUI | Alan O'Donovan G8NKM | Ian Skeggs M6FZC |
| E: cprec.g2lw(at)gmail.com | E: cprec.g2lw(at)gmail.com | E: cprec.g2lw(at)gmail.com |
| Committee Members: | | |
| Bob Burns G3OOU | Newsletter Editor | T: 01737 552170 E: g3oou(at)aol.com |
| Nick Stapley | Web Manager | |