

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

Next meeting: Friday 7th July 2017

GPS by Nick Stapley

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

Dear Reader

Future Club Meetings and Events

07 Jul 17	M	GPS by Nick Stapley
04 Aug 17	M	Summer Social
01 Sep 17	M	Antenna Modelling by Quin Collier
06 Oct 17	M	SDR Without Maths by Alan G0TLK
03 Nov 17	M	Millimetric Microwaves – Chris G0FDZ
01 Dec 17	M	Christmas Social
05 Jan 18	M	TBA
02 Feb 18	M	Annual General Meeting

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

07 Jul 2017 - GPS by Nick Stapley

Nick will give a brief history of the GPS system with its origin commonly said to lie in the signals received from Sputnik. He will give an overview of the way the system works, before delving into specific details of the Space, Control and User segments into which the system is divided. Finally he will look at how it is linked to surveys, maps and mapping, and look at future developments.

Recent Event News

02 Jun - Sub-sea Telegraph Cables at Enderby Wharf by Richard Buchanan

Richard presented an illustrated talk on the cable making activities at Enderby Wharf and some information on cable laying at sea. In the first days of cable laying there were no electronics of any sort, just a very long cable with a central copper conductor, insulation and steel supports to give it strength. The signal return was via the ground so the overall losses were very high. Typically a thousand or more volts at the sending end resulted in millivolts at the receiving end.

The Enderby Wharf marshy site started out as a seaman's hospital in the mid 1700s. The Navy then built a gun powder store on the site and filled it with gun powder from the Tower of London. The store was then replaced by Enderby Mill - the Enderby family having made their money from whale oil trading but availability of gas killed the oil trade so they looked for alternative trading products and in 1830 became involved in rope making.

In 1845 the mill (rope works) burnt down and was replaced in 1846 by Enderby House which included a structure called the Octagon Room which was used as a meeting place by the Geographical Society.

In 1850 the first undersea cable was laid across the English Channel but not without some problems - the cable finished one mile from the shore and had to be extended. At this time the Americans wanted a cable across the Atlantic from England to Newfoundland.

Cables of that time for deep sea use had a seven core centre conductor surrounded by an insulator made from Gutta Percha, a layer of steel strengthening and an outer insulating protection layer. After manufacture, cables were stored outside and exposed to the sun. In the summer this could cause the insulation to soften and the central conductor to move towards the outer

strengthening layer, lowering the breakdown potential of the insulation.

In 1857 Glass Elliott & Co took over the Enderby site and moved in their cable manufacturing facilities.

Cables for shallow sea use had an extra protection layer covered in layers of hemp. Gutta Percha, which is water proof and hard at room temperature, is made by boiling a latex product extracted from trees in South East Asia. Cables were made in two mile lengths. Steel for the original armouring of the cables was made by medieval methods with component materials specified in wide percentage terms. From 1865 onwards steel was made with much more precisely defined component materials.

In 1857/8 the first cable across the Atlantic was laid in two halves by starting at the centre join with two ships which sailed away from each other, one towards Newfoundland and the other towards England but one half broke. A second cable was laid but the insulation failed at high voltages. A third and final cable was laid which was successful.

Cables were first laid by the steam ship HMS Agamemnon. Later cables were laid by the Great Eastern which had some unique features - a propellor, paddle blades and sails to provide it with excellent control of its position. Lost cables had to be recovered with a grappling hook which was extremely difficult in depths of 2000 fathoms.

Signals were sent along the cables using Morse code but with positive and negative pulses - care was required to ensure that cable did not become charged due to excessive use of one or other polarity. This was resolved with the use of special control characters to leave the cable with little or no charge.

Simplex signalling meant that only one end could transmit at a time. This was resolved by the use of Wheatstone bridges at each end to enable duplex (bidirectional) communications. Received signals were applied to a galvanometer with an attached mirror and light source allowing the operator to see very small movements. Initial data rates were typically four words per minute (wpm) and this was then increased to 100 wpm by the use of compensation networks using inductors at each end. The original cables looked like massive capacitors which severely limited the maximum frequency response.

Later cables used embedded correction networks and then active repeaters to decrease the overall losses. Repeaters used modified gun barrels for an outer protection layer. Modern undersea cables use fibre-optics and active repeaters.

Repeaters were powered by a 2 amp constant current source which required up to 2000 volts at the sending end.

Undersea cable timelines:

1850 - 1950 Telegraph era

1950 - 1986 - Voice era

1986 - date - Optical era.

Richard also provided a copy of an article on Communicating with the Special Operations Executive (SOE) during WWII and the following photos after the talk:

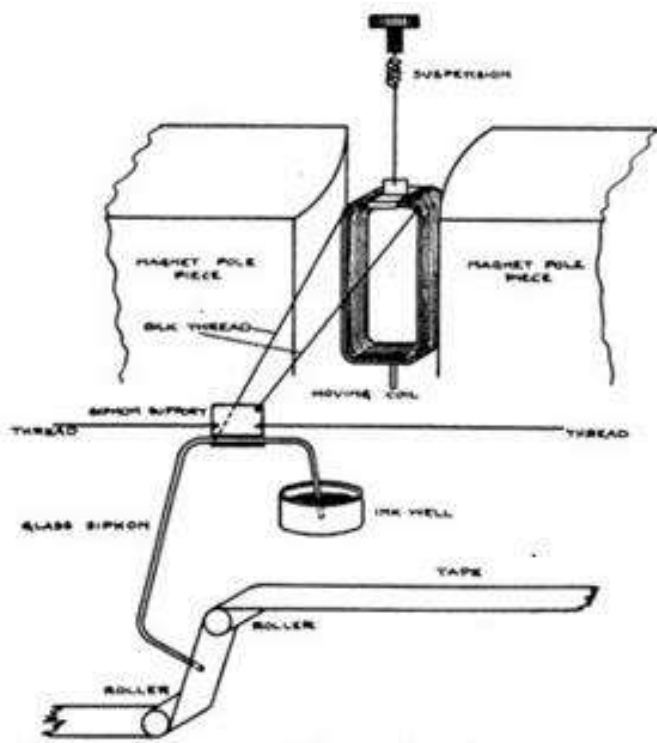
The SOE document will be reviewed in a future newsletter.

Typical undersea cables:

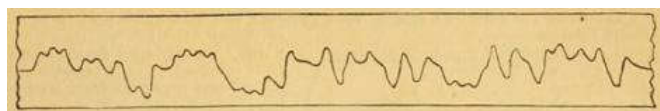


The cable on the extreme left has a diameter of 1.125 inches.

Moving coil galvanometer with mirror and recording device.



Paper Strip Recording



Saturday 17 June - Street Party in Beckenham

Apologies as this recently confirmed event did not make it into the last newsletter although most club members were subsequently advised of it by email a week beforehand.

Our Secretary Alan G8NKM was unfortunately unable to attend having fractured a rib a few days prior to the event so Jim and myself set up the HF and VHF stations and did most of the operating. Paul Dyer called in on his way

to Eastbourne and two Bromley club members also visited us.

The HF station consisted of Jim's FT450D, SEM Z-Match and recently erected 3.5MHz Windom aerial, my IC-7400 and home made HF-VHF dual Z-Match. The VHF station was Jim's FT726 and three band collinear.

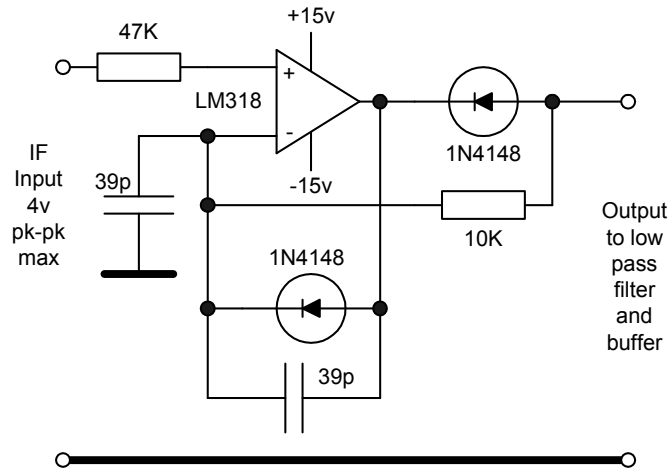
HF conditions were poor during the day but improved a little later in the afternoon. Nevertheless contacts were made around Europe on SSB and CW on 3.5, 7, 10 and 18MHz. VHF operation was on 144MHz FM with a number of local contacts. Nothing was heard on 50MHz.

This operation also provided an opportunity to test Jim's FT450D, Windom aerial and SEM Z-Match. The aerial was tested fed with 450ohm feeder and also configured as a Marconi vertical with the feeders strapped together and fed against a 30 foot counterpoise laid on the ground. The Windom configuration was one S point better for nearby UK contacts on 80m, probably because of the high angle radiation. Some minor issues with Jim's FT450D were corrected by carrying out a Factory Reset to restore the internal settings to their default values.

The weather was good but very warm, particularly in Jim's garage where the HF station was located - Jim is planning to insulate this area so that he can work there in the winter. Some of the street partygoers visited the stations and an information sheet on the club was available to visitors.

Technical Snippets

Continuing with the previous theme of detectors the following is an op-amp based AM detector for 455KHz. High frequency performance is a function of the frequency response of the op-amp which limits this particular example to about 1.5MHz.



In the interests of simplicity supply rail decoupling has been omitted. Circuit provided by WA1QIX

By placing the detector diode in the negative feedback loop of the op-amp the non-linear characteristic of the diode at low signal levels is almost completely corrected.

This circuit must be followed by a low pass filter to pass the audio signal and remove the IF signal and a buffer to isolate the filter from the following circuit. The remaining output signal consists of the recovered audio and a negative going DC potential proportional

to the incoming signal level that may be used for automatic gain control (AGC) and signal level indication.

TMFEIP by 'Theorist'

One of the few benefits of belonging to the Crystal Palace Radio and Electronics club is that the editor of this newsletter is so desperate for material that he will include almost anything. [*Strangled gasp* - Ed]. How else would I get published? You can of course stop me by writing something relevant to our radio/electronics club, and if you do I am sure the editor will be delighted. All this is a long-winded way of saying that this month's article has very little to do with radio, and nothing to do with electronics, but is a (sort of) follow up to last month's potted history of the theory of light. Unusually for me I have taken a few liberties with the truth here and there in what follows, to avoid detailed explanation.

The Most Famous Equation In Physics is undoubtedly $E = mc^2$. This gives the energy that is 'contained' in some way in a particle or object of mass m . Since the speed of light, c , is a very large number, the energy locked up in matter is huge. This is most obvious in nuclear explosions. However it is not generally appreciated that a consequence of this is that if you have a mechanical watch and wind it up, its mass will increase ever so slightly, or rather that of the spring that you have just wound. The energy you have added must 'go somewhere', and it ends up as mass.

Likewise some chemical reactions are called exothermic, which means that they give out energy in the form of heat. An example is adding strong sulphuric acid to water. If you do a great deal of heat is given off. No atoms are destroyed in this process, but energy has been given out, so the mass of the mixture must go down a bit. Endothermic reactions require energy to get them started, so in their case the mass of the components increases ever so slightly after the reaction. Incidentally always 'add acid to water and do what you oughter' for safety.

Photons definitely have energy, which is why you get warm when the sun shines, and why solar panels work. The energy of a photon is determined by its frequency and is given by the formula presented last month, $E = hv$, where v is the frequency. Yet photons have no mass. They are massless particles, yet they do have momentum. What is going on? One way of thinking about it is that while something like an electron, say, could be regarded as 'condensed energy', so a photon could be looked at as 'uncondensed mass'. You can work out what mass a photon should have if it were condensed by $E = hv$, to get the energy of the photon, and using TMFEIP then get the equivalent mass.

The Sun produces vast amounts of energy every second. It does this by nuclear fusion in its core, a by-product of which is the production of vast amounts of photons, and particles called neutrinos, every second. The energy output can be calculated, so using TMFEIP the mass loss of the sun can be calculated as 4 million tonnes per second. The surface of the Sun is hot enough that electrons and

protons boil off its surface, generating a solar wind of ionised particles. Satellite observations reveal that by this means the Sun loses another 1.5 million tonnes of mass every second, bringing the total to 5.5 million tonnes per second. Even so the Sun will keep shining for another 5 billion years, and by that time will have lost only about 0.034% of its current mass.

As these photons are produced in the core, they have to get through a lot of matter to get to the surface to escape. On average this takes 1 million years by a random walk process, although since the initial photon is repeatedly absorbed and re-emitted before it gets there, you could argue (and I would) that it is a different photon that escapes and not the original.

Last month I set a challenge to estimate the number of photons emitted by a 100 Watt light bulb in one second. The key word is 'estimate'. Here is how it is done, but make sure you use SI units throughout: Look up the frequency (ν) of visible light and choose a value somewhere in the middle of the spectrum, and assume that all the light from the bulb is of this frequency. Then look up Planck's constant and use the formula given above to get the energy of one photon of visible light. As a 100 W bulb emits 100 Joules of energy in one second, you can then estimate the number of photons emitted in one second. [Your answers will be checked at the next meeting - Ed]

Members News

a) Jim 2E0JFL has been working on improving his HF and VHF aerial systems. The VHF collinear is now several feet higher on a new short mast which also supports one end of a 80m Windom aerial with 450 ohm feeder into the shack. Jim is S9 on the club net channel in Coulsdon.

b) Linear Amplifiers - For some while I have been thinking about the design of medium power linear amplifiers and their cooling requirements with input from Jim on the cooling mechanics. The high gain 4CX250B radial-beam tetrode had been selected for use at VHF and a parallel arrangement of lower powered glass valves for HF as I have a collection of both types and their bases. However, the 4CX250B has some demanding requirements for a stabilised screen grid supply for linear operation and cooling air at a minimum of 6 cubic feet per minute and a pressure of 0.8 inches water gauge which requires a fairly substantial (and possibly noisy) centrifugal fan.

As a possible alternative option, I have been investigating the Gi7B, a low cost Russian UHF high slope power triode which has a dissipation of 350 watts with sufficient cooling air and will work from low frequencies to 1300MHz and more.

The air requirement is specified as 40 cubic metres per hour for 350w dissipation and 27 cubic metres per hour for 250w dissipation, both of which can be met with a 15-20 watt flat body fan and a simple insulated chimney to contrate the air flow over the anode structure.

This high slope valve is designed for grounded grid operation and will provide a minimum output of 250 watts in linear mode and 300 watts in class C with a



2000 volt supply which is similar to the 4CX250B. However, the grounded grid power gain is only 12-13dB so some 20 - 30 watts of drive is required.

As you can see from the above picture the concentric base assembly on the lower left is relatively simple and a suitable socket can be fabricated from small pieces of aluminium and printed circuit board or purchased ready made. Connections, from left to right, are Filament, Cathode and filament, Control grid and Anode. The filament requires a 12.6v supply at 2 amps.

Grounded grid amplifiers have a variable input impedance over the driving cycle so for best gain and linearity a resonant matching circuit must be provided with a loaded Q in the range of 5 - 10. The control grid ring may be clamped to the chassis with the standby and quiescent (zero drive) anode current controlled by the cathode circuit for which a ready made control board is available for purchase. Another benefit with the triode compared to the 4CX250B tetrode is that there is no requirement for a regulated screen power supply.

Cost is typically \$35 - \$50US from a number of Russian or Eastern bloc countries and one has just been received for evaluation but its linearity has yet to be determined. Apparently the Gs9B is an equivalent to the Gi7B with superior linearity - more to follow. There are many design articles on the Internet showing the use of one to six Gi7B valves in medium to high amplifiers from Top Band to 23cms - two valves being the most popular format. Google Gi7B for data and applications.

Miscellaneous

a) Newsletter

A big thank you to Nick Stapley who completed the last newsletter while I was away.

b) Japanese Holiday

Cathy & I have recently returned from a trip to Japan, staying on the main island of Honshu and touring Tokyo, Hiroshima, Hakone (Mount Fuji area), Nara and Kyoto.

Japan is over 70% mountainous terrain with approximately 18% of the land mass suitable for human settlement. Hence Japanese cities are typically sprawling and densely populated.

Central Tokyo has a population of 11 million people, with the population of the Greater Tokyo prefecture estimated

at over 35 million people. Japan is very seismically active with over 1,500 earthquakes per year. The two major religions in Japan are Shinto and Buddhism.

We visited Miyajima Island, off the coast of Hiroshima, which houses the Itsukushima-jinja shrine, with its red torii gate and the Peace Park with its one remaining bomb damaged building left as a memorial and the wonderfully archived Peace Museum.



From Kyoto we travelled to see Kinkaku-ji, which was originally a retirement villa for the 14th century Shogun, who wished to coat the exterior in gold leaf. After he died, the building was converted into a Zen Buddhist temple, in accordance with his wishes.



We travelled at speeds of 300 Km per hour on Japan's high-speed Shinkansen (Bullet Train). Very smooth, quiet, comfortable and running exactly to time.

Kyoto, the former capital, is 'old Japan' with quiet temples, beautiful gardens, colourful shrines and its Gion geisha district but also in part is very modern, catering for the many tourists who want to shop and explore.

Convenience and technology is the norm – see this typical vending machine arrangement – you can get beer, spirits, snacks, sandwiches, tins of coffee (red button means hot) at any time. Don't get Cathy started on the spotless and plentiful public loos (UK please take note!) and no graffiti.



Water and waste pipes are all underground, but the majority of the 100V AC mains supply is well above head height in the streets as you can see from this photo.



It was easy to get around in Tokyo with road signs in Japanese and English. The Metro was simple to negotiate and mainly 'civilised' despite the high volume of people using it. Cold tap water in houses and hotels is perfectly safe to drink and clearly labelled in public facilities if not potable.

The flight time was around eleven and a half hours and due to the eight hour difference in time zones the day going out was 16 hours long and the day coming back was 32 hours long.

Three amateur radio aerial installations were spotted during our travels but no on-air activity was attempted.

Seemed to us to be a very respectful society so all in all a good holiday and another experience to chalk up.

c) CQ WPX Contest on 27/28 May

There are SSB and RTTY versions of this contest earlier in the year. This contest provides a good test for receiver selectivity and dynamic range as it is usual to hear S9+20dB signals every 500Hz of the 14MHz CW band in the evenings.

Despite having some lingering problems with jet lag from my flight back from Japan on 22 May I decided to have a go at the CQ WPX CW Contest during the weekend of 27/28 May. This is an annual HF bands international contest where everyone contacts everyone so there is no lack of opportunity. There are categories based on transmitter power, single operator, multi-operator single transmitter and multi-operator multi-transmitter.

The scoring rules encourage entrants to make contact with as many different amateur radio prefixes as possible and as a result there are some unusual prefixes activated over each weekend.

Saturday was a bit of a disaster as tiredness caught up with me fairly early so after about five contacts I gave up and went to bed. Sunday was much better but unfortunately conditions were worse and the 21 and 28MHz bands were very quiet for most of the day, only coming to life after 17:00 hours. Top Band and 80m were busy but with a lot of QRN (electrical noise).

By the end I had made 152 contacts with 115 different prefixes including OH0X (Aland Archipelago) 4M1K (Venezuela), VP2MDG (Montserrat), KP2M (Virgin Islands), WP3C (USA) and ZA/OG1N (Albania). The majority of the contacts were with European stations with little heard from South America and nothing from Japan and Australasia.

In previous years it was usual to hear leading stations with serial numbers on the four to five thousands but this year the highest that I heard was in the three thousands.

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 ono. A photo may be seen at <http://www.qsl.net/g3oou/pto.html>
- 1.4MHz crystal filters 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)

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



G300U

Diary of External Events

1-2 Jul 2017 - VHF Field Day

Club/group based field day event on the 50 / 70 / 144/ 432 / 1296Mhz bands. Full rules on the RSGB web site at <http://rsgb.org/>.

14-16 Jul 2017 - Ham Radio Show, Friedrichshafen

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].

16 Jul 2017 - MCMICHAEL RALLY

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. Tabeles and car boot spaces are £10. Details, by email, from [m5alg\(at\)radarc.org](mailto:m5alg(at)radarc.org) or [www.mcmichaelrally.org.uk/]

2-3 Sep 2017 - SSB Field Day

Portable and fixed station HF bands contest with multiple sections. Full rules on the RSGB web site.

29-30 Sep 2017 - National Hamfest

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].

13-16 Oct 2017 - RSGB CONVENTION

Kent's Hill Park Training and Conference Centre, Swallow House, Timbold Drive, Kent's Hill Park, Milton Keynes, Buckinghamshire MK7 6BZ. The Convention programme of lectures for all interests will be available on the website.

05 Nov - WEST LONDON RADIO & ELECTRONICS SHOW (Kempton Rally)

Kempton Park Racecourse, Staines Road East, Sunbury on Thames, TW16 5AQ.

19 Nov - 40th CATS Bazaar

Oasis Academy Coulsdon, Homefield Road Coulsdon.

News from other Clubs

Club Secretaries – please send your meeting programs to our newsletter editor Bob G300U. 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.

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
28 Sep 999 Emergency - Talk by Steve Shorey G3ZPS

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](mailto:enquiries(at)bdars.co.uk). Web: www.bdars.co.uk
18 Jul Morse Code by Graham G4NPD
15 Aug Social and On-air Evening
19 Sep Short Talks Evening

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](mailto:secretary(at)g0mwt.org.uk) Web: www.g0mwt.org.uk
04 Jul "Three Short Talks"
01 Aug "Constructors Competition" - CARS Members
05 Sep Radio Caroline " - by Martello Tower Group

Coulsdon Amateur Transmitting Society (CATS)

8:15pm on 2nd Monday each month. Contact: Andy Briers G0KZT on 07729 866600 or [secretary\(at\)catsradio.org](mailto:secretary(at)catsradio.org). Web site: <http://www.catsradio.org/>
10 Jul TBA
08 Aug CATS Annual BBQ

Crawley Amateur Radio Club (CARC)

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 [secretary\(at\)carc.org.uk](mailto:secretary(at)carc.org.uk) or Web: <http://www.carc.org.uk/>
28 Jun Talk by Nick, G3RWF, RSGB President
26 Jul PCB production Matt Nassau, M0NJK

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](mailto:secretary[at]cvrs.org). Web www.cvrs.org
06 Jul Operating in East Africa by Nick Henwood
20 Jul DXing without the Luxuries by Richard G8ITB
29 Jul Summer Barbeque / IOTA

Dorking & District Radio Society

Meetings at 7.45pm. Contact: David Browning (M6DJB) at [djb.abraxas\(at\)btinternet.com](mailto:djb.abraxas(at)btinternet.com). Web site: <http://www.ddrs.org.uk>
25 Jul South Downs evening
26 Sep ISS project with schools by Mike Senior G4EFO

Echelford Amateur Radio Society

Meetings on 2nd and 4th Thursdays of each month at the Weybridge Vandals Rugby Football Club. Enquiries to John at [jho_g4gsc\(at\)btinternet.com](mailto:jho_g4gsc(at)btinternet.com) or 01784 451898. Web site: <http://www.qsl.net/g3ues/index.htm>

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/>

- 26 Jul On air operating and chat
- 23 Aug Construction Contest
- 27 Sep View and discuss online AR YouTube videos

Hereford Amateur Radio Society

Meets on the first Friday of each month at Hill House, Newton, Nr Leominster, HR6 0PF. Contact: enquiries@hars.wagnet.co.uk or <http://herefordradioclub.uk/>
07 Jul HARS Club meeting

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@hotmail.com or <http://www.harc.org.uk/>
29 Jun Thursday Evening Fox Hunt
06 Jul Pirate Radio - Mick Senior G4EFO
03 Aug FPGAs by Rahil Chaudery
07 Sep DXing from Africa, Nick Henwood G3RWF

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@msars.org.uk) or www.msars.org.uk
07 Jul Chairman's Barbeque
28 Jul Fox Hunt: Walking Burgess Hill - Start from Cyprus Road Car Park
25 Aug The RNLI by Penny

South East Essex Amateur Radio Society (SEARS)

Contact Dave G4UVJ on: 01268 697978 or [secretary\(at\)southessex-ars.co.uk](mailto:secretary@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.

- 16 Jul Club Barbecue and Play Day
- 08 Aug SEARS 35th Anniversary evening its 35 years since SEARS was formed on 18th August 1982
- 12 Sep "The Moving Coil Meter" by Dave Ellis, G4AJY,
- 10 Oct Latest news from the RSGB by Vic RSGB DRM

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@g3src.org.uk). Web: <http://g3src.org.uk/>
10 Jul SRCC Summer Barbecue
02 Oct Autumn Surplus Equipment Sale

Sutton & Cheam RS

8pm on 3rd Thursday every month. Contact John Puttock G0BWV on 020 8644 9945 or email [info\(at\)scrs.org.uk](mailto:info@scrs.org.uk) Web: <http://scrs.org.uk/>. SCRS run a practical group most Monday evenings at the Bandstead Scout Hut.
20 Jul The Icom IC7300 SDR Transceiver – Mike Davies – G0KAD
17 Aug ICQ PodCasts – Martin Butler – M1MRB

Wimbledon & District Amateur Radio Society

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](mailto:andrew.maish@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	17 Sep & 8 Oct 2017	Bromley Kent	Bromley & District ARS	2 days (Sun)	www.bdars.org
Full	2, 9, 14 Oct & 4, 11, 18 Nov 2017	Eltham, SE9	Cray Valley RS	2 evenings (Mon) + 4 days (Sat)	www.cvrs.org
Foundation	3 & 10 Feb 2018	Eltham, SE9	Cray Valley RS	2 days (Sat)	www.cvrs.org
Intermediate	Mar/Apr 2018 (TBC)	Bromley	Bromley & District ARS	3 days (Sunday)	www.bdars.org
	= course commenced				

CPREC Committee Contact Information

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