

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.gsl.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: Friday 4th August 2017

## *Summer Social*

In this issue: *Future Club Meetings, Recent Event News, Technical Snippets, 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

04 Aug 17	M	Summer Social
01 Sep 17	M	Antenna Modelling by Quin G3WRR
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.

### **04 Aug 2017 - Summer Social**

The next meeting will be our summer social at which there will be opportunities for informal discussions over some food and also to operate the club radio station.

Please bring along a contribution of food (just sufficient for yourself and any accompanying friends or colleagues) which will be laid out as a shared buffet.

We can heat food in the kitchen oven but are not planning to do any proper cooking.

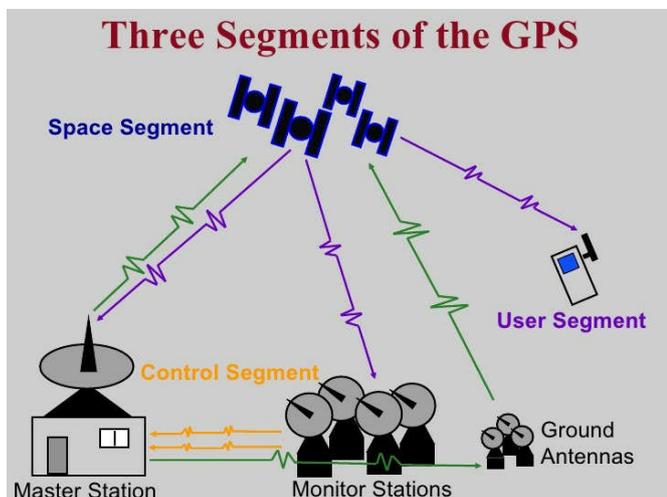
### Recent Event News

#### **a) 07 Jul 2017 - GPS by Nick Stapley**

Nick presented an illustrated talk on the Global Positioning System (GPS) commencing with the following brief timeline of events:

- Origins said to lie with Sputnik in 1957
- 1960 TRANSIT - five satellites allowing hourly fix for Polaris submarines
- 1967 - TIMATION satellite demonstrated the use of atomic clocks in space
- 1973 – Pentagon meeting defined the blueprint for 'NAVSTAR' which became GPS
- 1975 - First Block I GPS Satellite launched
- 1983 - Korea Air Lines Flight 007 resulted in President Reagan allowing non-encrypted signals for civilian use
- All 24 planned satellites launched by 1994
- To present day – additional signals and improvements

The basic concept:



- GPS satellites continuously orbit the Earth at a height of about 12,550 miles in semi-synchronous orbits and

transmit their current time and position in the L band originally at 1176.45MHz and 1575.42MHz.

- The satellites have a number of on-board Rubidium and Caesium atomic clocks, from which a common 10.23MHz standard is derived.
- GPS receivers monitor multiple satellites and solve simultaneous equations to determine the precise position of the receiver
- Minimum of four satellites needed to get latitude, longitude and altitude and a time difference error
- 24 satellites are required to allow at least 4 satellites in line-of-sight 24x7 from anywhere on Earth

Ground control stations monitor and control the satellites, and form one of the three 'segments' of GPS which are the Space, Control and User segments.

A simple two dimensional case with fixed transmitters was analysed as a basis for examining the more complex real 3D case. In the real case a number of complex issues have to be resolved to get a position:

- Transmitters are moving so need some way of accurately knowing their positions at all times
- Need a way to identify and select a particular satellite's messages
- Many sources of error other than timing differences
- The speed of light is defined as 299,792,458 m/s *in vacuo*, which is about 186,282 miles per second or 670,616,629 mph. This is equivalent to travelling 30cms in one nanosecond or 300m in one microsecond. Timing is therefore critical.

- The satellite clocks, although derived from an atomic standard, run at a slightly different speed compared to those at ground level, as time goes slower in a stronger gravity field than in a weaker field, in accordance with the general theory of relativity. The satellite clock errors are corrected by the ground control stations; these send correction factors to the satellites which are then sent to the receivers in the satellite messages.

- The receivers can then correct for the time sent in the message using some maths routines. Relativistic errors would amount to 38 microseconds/day if this were not taken into account. Ground stations send correction data to the satellites every four hours.

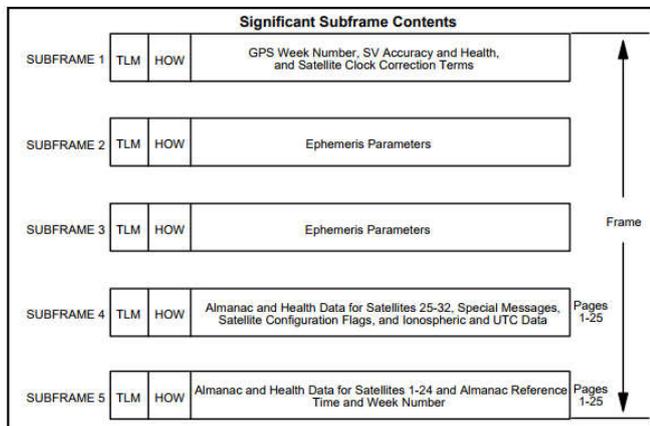
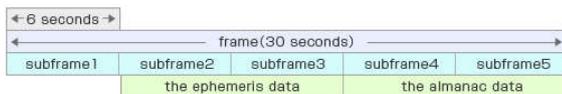
- Transiting the ionosphere cause delays to the satellite signals which then result in location errors at the receiver. This can be alleviated by monitoring the ionosphere and using modelling to derive correction factors, and by using signals at two or more different frequencies. Correction data for this is also contained in the satellite messages sent to the receivers.

The receiver has to continuously receive data from a minimum of four satellites and solve at least four simultaneous equations in order to calculate and display its position to the user.

Each satellite transmits messages at 50 bits per second and a complete message takes 12.5 minutes. The message structures are complex and are broadly as shown in the diagram over the page. A message consists of 25 frames each of which has 5 sub-frames of 10 words. Each sub-frame starts with a telemetry word (TLM) which identifies the satellite, and a 'hand-over word (HOW) which has the timing information. Sub-frames 2 and 3 have ephemeris data which is precise positioning data for the transmitting satellite. Sub-frames

4 and 5 primarily have almanac data which gives approximate position data for all the satellites. This enables a receiver to know what satellites will be in view and thus speeds up a cold start.

This diagram shows the Frame Structure of the Navigation Message sent by X25 at 50 bits per second:



It was originally planned to have 24 satellites in orbit but this was increased to 27 in 2011 and 31 by 18th April 2017. Six satellite are in line of sight at any one time from almost everywhere on the Earth.

A typical GPS error budget (metres per satellite) includes the following items:

<b>Ionosphere</b>	<b>5.0 – 7.0</b>
Troposphere	0.5 - 0.7
Signal arrival (C/A)	2.0 – 3.0
Satellite Clock Errors	1.5 - 3.6
Orbital Errors	1.0 - 2.5
Multipath	0.6 - 1.2

To increase the overall accuracy of the system the following can be done:

- Use more frequencies
- Use more satellites
- Use other systems as well (e.g. GLONASS)
- Use 'Differential GPS'
- Use 'Carrier Phase enhancement' - CPGPS or Real Time Kinematic Positioning/RTK

Other GPS systems in operation or planned are:

- GLONASS (Russia) 1995 and 2011 - 24+3 Satellites
- GALILEO (EU) Planned for completion in 2020 - 27+3 Satellites
- BeiDou/COMPASS (China) - 10 Satellites in Geostationary orbit to be expanded (COMPASS) to 35 satellites by 2020
- IRNSS (India) - 3 Satellites planned in Geostationary orbits + 4 Geosynchronous
- Quazi-Zenith (QZSS) (Japan) - 3 Satellites for communications and navigation

## b) Outcome from May's "One Route Through Project Design" by Bob G300U

Following a short talk, club members split into three groups for separate brain storming sessions and came up with three possible projects and their specifications which our Secretary Alan has summarised as follows:

### Group 1 Project: Receiver

Attributes:

- A simple 2 band receiver with FM and medium wave AM capabilities.
- Analogue frequency display with on/off, tuning and volume controls.
- The receiver should be constructed on a single pcb.

[There are a number of current ICs that may be used to construct such a receiver relatively easily - Ed]

### Group 2 Project: Power Supply

Attributes:

- A more complex design providing 0 to 30 volts at 10 amps with a digital display of parameters.
- Construction is to be modular with an on/off switch, a rotary control to alter the voltage and banana output posts.
- Protection of the mains input and the DC output should be included.

### Group 3 Project: Antenna

- A complete multiband short wave antenna covering 1.6 to 30MHz.
- The antenna needs to be compact and easy to erect, both inside a house or flat and also on an external balcony.
- The antenna should be capable of receiving and transmitting.

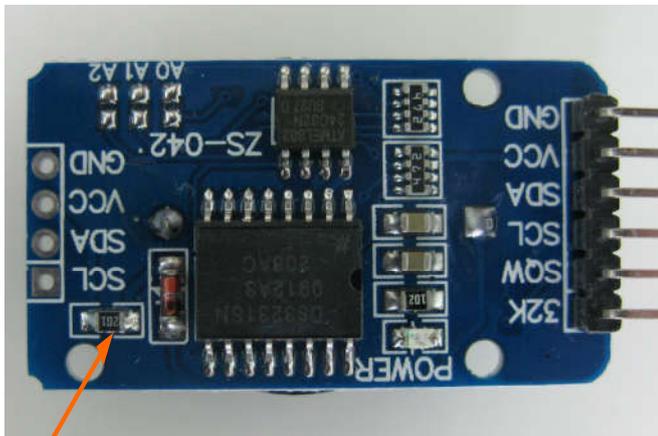
The August club meeting will be an ideal opportunity to discuss these ideas and decide which project(s) to take further.

Your scribe has recently completed a 13.5v 25amp DC power supply using mostly standard parts which will be available for examination at the meeting together with a circuit for a general purpose bench power supply developed and produced in small quantities some years ago.

### c) Frequency Counter Update

Alan writes: 'It's come to my attention there's a problem with the Real Time Clock module used in the frequency counter. The module's circuit includes a battery charging arrangement comprising a resistor and diode to Vcc which puts almost 5v onto the battery. It seems the device was designed to use a rechargeable battery type LIR2032. The battery shipped with the module is a lithium CR2032 and should definitely not have any voltage applied to it! The cure is to simply to remove the resistor in the charging circuit shown by the arrow in the following photo.

To remove the resistor you should be able to lift the module away from the main board exposing the module's underside. Using a soldering iron with a flat tip you can then heat the whole resistor up and when the solder melts, flick it away from the board.



I tried this technique on two boards with great success. If you experience any problems bring your counter along to the August meeting and I will sort it out for you.

73s

Alan G8NKM'

### Technical Snippets

**a) During the recent hot spell** my hard drive based video recorder developed picture and sound errors and the upper case became hot after a few hours of operation. The support desk said that retuning it (a software controlled process) would solve the problem - it did not. Some investigation on the Internet suggested that the manufacturer had received complaints of excessive cooling fan noise and had issued a software patch to permanently turn it off after a short run at switch-on. A low cost but not very intelligent solution.

After inspecting the electronics it was apparent that with a few additional components the fan could be turned on when the unit was switched on and not in standby mode. This modification has now been implemented and the picture and sound errors have disappeared. I now plan to add a thermostatic control, similar to that on the club technical web site, so that the fan only runs when it is needed and also investigate if a quieter fan can be installed. The fan is a 40mm square unit which is a standard size.

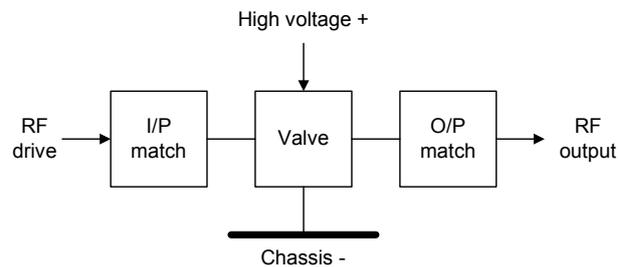
### **b) New Power Amplifier**

As mentioned in the last newsletter I have been working on the design for a new linear amplifier using a single Russian Gi7B or the more linearised version known as a Gs9B and I now have both in stock. The plan is to fit separate HF and VHF amplifiers into a Heathkit SB-101 case and the mechanics are now well advanced. The HF amplifier needs a lot more space due to the physical size of the tuning and matching components to cope with a 2000V supply and 300W of RF.

The VHF amplifier uses a loaded quarter wave line on 144MHz and additional loading inductors on 50 and 70MHz contained with the valve in a square metal cavity. The cavity makes the external screening much simpler and also acts as a guide for the cooling air from the fan mounted at the rear end. Grounded wire

grids on the air inlets and outlets protect the fans and the surrounding electronics from the high RF field inside the PA enclosures and around the valve anodes and also prevent the user from touching the high voltage areas.

Grounded grid amplifiers are generally stable but have some specific requirements to obtain maximum gain and linearity.



The input match must be a tuned circuit, generally based on an L section or pi section network whose flywheel action helps to offset the change in input impedance over the driving cycle. Without this it is almost impossible to obtain the best gain and linearity, particularly when solid state transceivers are used as drivers.

The valve should be monitored for anode and control grid current and exhaust air temperature as a minimum with input SWR being a useful extra. A high voltage supply fuse protects against damage from internal flashovers. If the amplifier is to be used in class AB1 then the control grid current must be zero.

A simple anti-parasitic network should be used at the anode and the anode RF choke should not have any spurious resonances in the bands to be used otherwise it is likely to overheat.

The output network can be a Pi or Pi-L network - the latter is best for harmonic suppression. Alignment is critical for best results as the impedance at the cathode is affected by the output match settings.



All of the metal and plastic work is home made so things proceed slowly. The space on the right is for the VHF amplifier which uses physically smaller fixed and variable components and has its own fan which has yet to be fitted. The tuning control positions on the front panel have yet to be determined, hence the remaining masking tape. Some form of flexible couplings will connect the front panel controls to the variable component shafts.

I will bring this 'work in progress' project along to the next meeting, warts and all.

There are many ways to achieve higher power output than is available from a conventional 10/50/100W transceiver. Some examples are:

- One or two valves on a high voltage supply (2KV plus) using 811, 813, 4CX250B, 4-250, Gs9B etc.
- Multiple smaller valves in parallel on lower supply voltages, typically 600 - 800v using 6146, PL509 etc.
- Multiple bipolar power transistors with power combiners using 13.5, 28 or 50V supplies
- Multiple MOSFET power transistors with power combiners using 13,5v, 28v or 50v supplies
- New dual MOSFET power transistors can achieve 1000W output from push-pull operation of two transistors in a single package. These usually operate from a 28V or 50V supply and can be broadbanded to cover the HF bands from 1.8 - 30 or 50MHz in a single amplifier.

Each approach has its advantages and disadvantages and it all depends on your construction abilities, what you have in your junk box, the amount of money that you wish to spend and your preferences about high or low voltage supplies.

The use of multiple line output valves was popular with Stateside amateurs at one time but these had very questionable linearity and are now becoming difficult to obtain and therefore more expensive. One US design featured ten in parallel to obtain 1000W output but at the expense of driving the valves well beyond their safe levels so very limited key down time. In comparison, the modern MOSFET transistors are almost bullet proof as long as properly cooled.

## **Members News**

### **a) Scrap MDF, ladder rack and not breathing the dust.**

Three main activities go on in my study. Design work on mechanical devices like motorcycles (I can't leave anything well alone), learning french (tutor says with a small " f " is polite) and my radio station including Advanced licence study which is even worse than the french no matter what size the initial letter.

To keep a semblance of order I decided to make a dedicated radio area. Ruling out the American white oak and the the posh walnut, which I don't like anyway, I had a scout 'round the garage and found some 10mm MDF.

Dreadful stuff, banned in the USA and known as Maximum Danger Fiberboard by a friend in the trade. Don't Breathe The Dust. My stuff was warpy and not thick enough for work surfaces. I also found some 5 foot lengths of ladder rack, the sort with strong brackets which slot in at 32mm intervals together with some brackets.

I gave a lot of thought to the layout of the station and decided to have the HF set at eye level due to it's need for careful adjustment. The VHF, being channelize, goes above. It doesn't need so much knob twiddling so I don't

mind having it a bit higher than optimum. As the FT726R is deeper than the HF setup so it's on an L shaped shelf. The cut out bit of the L allows me to lean over the little table to do the log.

The "not thick enough" MDF had hung in the rafters in the garage for a long time and and taken on quite an interesting standing wave. I cut out twice as many pieces for the shelves and table so that I could double them bearing in mind of the sense of the standing wave. I hoped that when I glued them together with waves in the opposite sense on each piece they would come out flat. Working on a flat surface, ie the motorcycle bench, and using PVA glue I placed all the heavy objects in the workshop on them. The warping did cancel out and the pieces came out flat and now thick enough at 20mm. The table needed stiffeners underneath but the shelves seem OK without.



All that remained to do was to cut all the pieces accurately to size, plane the edges square and smooth and varnish them before fitting. Having all my radio work in one place has been very successful in keeping order and cutting searching time. Should have done it sooner.

73, Jim, 2E0JFL

### **b) Equipment Sale**

Victor G1PKS has asked if the club would assist in the sale of some of his amateur radio equipment. A list is included in the Noticeboard section of this newsletter.

## **Miscellaneous**

**a) Richard Buchanan**, our June speaker, provided a document on the Special Operations Executive (SOE) entitled 'Communicating with the European Resistance',

copies of which may be obtained from the Society of Post-Medieval Archeology.

This document examines the UK based communications facilities. Established in 1940, the SOE was responsible for coordinating all acts of sabotage against the enemy overseas. This was only possible with the aid of a reliable communications link with the Resistance. By examining SOE's Home Stations, this article demonstrates the value the organisation placed in reliable wireless communications.

The document will be available for reading at the next club meeting.

**b) Youngsters on the Air (YOTA) 2017** - this event will take place at Gilwell Park, the UK Scouting HQ, from 5-12 August 2017. There will be 80 young people under the age of 26 from 30 countries – from all over IARU Region 1 as well as Japan — representing their national amateur radio societies at this event.

Activities will include a special event station, a buildathon, antenna building, an Amateur Radio Direction Finding (ARDF) contest and a Summits on the Air (SOTA) activation. There will also be an opportunity to visit Bletchley Park—including the National Radio Centre—and the Science Museum.

More information from:

<http://rsgb.org/main/about-us/yota-2017/>

[Source RSGB website - Ed]

### c) RSGB Strategy

The RSGB have published their new five year strategy which states: *Our new strategy for the next five years was launched at the 2017 AGM. It followed a detailed consultation with the Board, Regional Council, Committee Chairs, Honorary Officers, HQ staff as well as the wider RSGB membership and amateur radio community.*

More information is available from the RSGB web site at:

<http://rsgb.org/main/about-us/rsgb-strategy/>

**d) Operation Crossbow** - did anyone see this programme on BBC4 on Sunday 23 July at 8pm? Interesting film on the use of 3D photography in WWII.

### 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

#### a) From the shack of Victor G1PKS:

- RF dummy load and watt meter
- SEM Z match £60
- Yaesu FT 101ZD HF transceiver £150
- SWR meter
- Trio R2000 receiver with HF & VHF
- Alinco 6m DR206 transceiver (DR-M06?)
- Heathkit Oscilloscope

- PSU with variable output
- Advanced Morse Trainer MM2 by Microwave Modules Ltd plus power supply £60
- 2 Morse keys with sounders for training Cubs and Brownies £25
- Box of Transistors and chips most new £10
- Boxes of components i.e. variable capacitors, low voltage transformer, valves, etc.
- Yaesu hand held FT 252E £40

Offers to Bob G3OOU on [g3oou\(at\)aol.com](mailto:g3oou(at)aol.com) or Alan G8NKM on [Alan.odonovan\(at\)btinternet.com](mailto:Alan.odonovan(at)btinternet.com).

#### b) From the shack of Bob G3OOU:

- 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)

#### c) Donated to the club:

- 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.
- Racal 9918 frequency counter covering 10Hz to 560MHz in two ranges with temperature controlled crystal oven frequency standard and VLF adaptor that speeds up very low frequency measurements - £55.

All excl P&P. Contact Alan G8NKM 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



G3OOU

### Diary of External Events

**20 Aug 2017 - RUGBY ATS ANNUAL RADIO RALLY**  
Princethorpe College, Princethorpe, Rugby, CV23 9PY.  
Open from 10am to 4pm, entry £3. Sellers access from 8am. Car boot area, catering on site. Details from Tony, G0OLS on 0775 968 4411 or email to [rally@rugbyats.co.uk](mailto:rally@rugbyats.co.uk).  
[\[www.rugbyats.co.uk\]](http://www.rugbyats.co.uk)

**27 Aug 2017 - MILTON KEYNES ARS RALLY.**  
The Irish Centre, Fenny Stratford, Bletchley MK2 2HX (opposite Dobbies)  
Open at 10am. Contact Tim Cowell, G6GEI on 07976 262 497 or email [renegade62@hotmail.co.uk](mailto:renegade62@hotmail.co.uk)

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### 2-3 Sep 2017 - SSB Field Day

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

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### 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](http://www.nationalhamfest.org.uk)].

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### 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.

Videos of past convention lectures are available on the RSGB web site.

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

Kempton Park Racecourse, Staines Road East, Sunbury on Thames, TW16 5AQ. Talk in station and on site car parking is free. Open at 10am with disabled visitors gaining access 10 minutes earlier. Trade stands, a Bring & Buy and special interest groups, lectures, a raffle and catering on site. Details from Paul, M0CJX on 0845 165 0351, [info@radiofairs.co.uk](mailto:info@radiofairs.co.uk).

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### 19 Nov - 40th CATS Bazaar

Oasis Academy Coulsdon, Homefield Road Coulsdon. Open 10am to 1pm, entry £1.50. Car parking and disabled facilities are available. Bring & Buy and flea market. Catering on site. Details from Andy Briers, G0KZT on 0772 986 6600 or email [bazaar@catsradio.org](mailto:bazaar@catsradio.org).

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## 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.

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### 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](mailto:secretary@brats-qth.org) or <http://www.brats-qth.org/brats/>

28 Sep 999 Emergency - Talk by Steve Shorey G3ZPS

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### 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](http://www.bdars.co.uk)

15 Aug Social and On-air Evening  
19 Sep Short Talks Evening  
17 Oct Skills Night

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### 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](http://www.g0mwt.org.uk)

01 Aug "Constructors Competition" - CARS Members  
05 Sep Radio Caroline " - by Martello Tower Group  
03 Oct AGM and Awards

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### 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/>

14 Aug CATS Annual BBQ  
11 Sep TBA  
09 Oct Swimming Pool Maintenance by David G6VMI

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### 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/>  
26 Jul PCB production Matt Nassau, M0NJX

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### 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](http://www.cvrs.org)

29 Jul Summer Barbeque / IOTA  
04 Aug Current spectrum issues, by Murray G6JYB  
22 Sep Junk Sale  
06 Oct CVRS 70th Anniversary Talk

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### 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>

26 Sep ISS project with schools by Mike Senior G4EFO  
24 Oct The demise of hobbies - the rise of amateur radio David Smith M0SXD  
28 Nov AGM & RSGB film

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### 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>

27 Jul '999 Emergency' - Steve Shorey, G3ZPS  
10 Aug Raynet - Colin, M0NLP

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### 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](mailto:sionet3344(at)hotmail.co.uk) Web: <http://herc-hastings.org.uk/>

23 Aug Construction Contest  
27 Sep View and discuss online AR YouTube videos  
25 Oct On air operation  
22 Nov Forum Discussion on Amateur Radio  
Dec No meeting

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### 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/>

04 Aug The Internet and the Silicon Chip, Jeff Williams

### 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](mailto:g3zbu@hotmail.com) or <http://www.harc.org.uk/>

03 Aug FPGAs by Rahil Chaudery  
 07 Sep DXing from Africa, Nick Henwood G3RWF  
 05 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@msars.org.uk](mailto:M6ZRJ@msars.org.uk) or [www.msars.org.uk](http://www.msars.org.uk)

28 Jul Fox Hunt: Walking Burgess Hill - Start from Cyprus Road Car Park  
 25 Aug The RNLI by Penny  
 08 Sep Smart Phones by Chris G4ZCS  
 06 Oct About Aviation by Richard

### South East Essex Amateur Radio Society (SEARS)

Contact Dave G4UVJ on: 01268 697978 or [secretary@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.  
 08 Aug SEARS 35th Anniversary evening

12 Sep "The Moving Coil Meter" by Dave Ellis, G4AJY,  
 10 Oct Latest news from the RSGB by Vic RSGB DRM  
 14 Nov AGM

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

07 Aug Video Evening  
 04 Sep Sub-sea Telegraph Cables at Enderby Wharf with Richard Buchanan  
 02 Oct Autumn Surplus Equipment Sale  
 06 Nov The Metropolitan Police Communications System

### Sutton & Cheam RS

8pm on 3rd Thursday every month. Contact John Puttock G0BWV on 020 8644 9945 or email [info@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.  
 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@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)	<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>
Intermediate	25 Feb, 11, 18 Mar 2018	Bromley	Bromley & District ARS	3 days (Sunday)	<a href="http://www.bdars.org">www.bdars.org</a>
= course commenced					

### CPREC Committee Contact Information

#### Officers:

Chairman:	Secretary:	Treasurer:
Damien Nolan 2E0EUI 7 Fonthill Court Honor Oak Road London SE23 3SJ 07900 242541 <a href="mailto:Gorby928@gmail.com">Gorby928@gmail.com</a>	Alan O'Donovan G8NKM 2 Mackenzie Road Beckenham Kent BR3 4RU 020 8778 9660 <a href="mailto:Alan.odonovan@btinternet.com">Alan.odonovan@btinternet.com</a>	Ian Skeggs M6FZC Ground Floor Flat, 24 Kendall Road Beckenham Kent BR3 4PZ 020 8650 9049 <a href="mailto:ian.skeggs@btinternet.com">ian.skeggs@btinternet.com</a>
Committee Members:	Newsletter Editor	01737 552170 or <a href="mailto:G30OU@AOL.COM">G30OU@AOL.COM</a>
Bob Burns G30OU Nick Stapley		