CPREC

G2LW

Palace Pulse

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.

Web sites:	Club Admin:	http://cprec.btck.co.uk/
	Club Technical:	http://cprec.btck.co.uk/OurTechnicalSite
Email:	crystalpalaceradio.club@gmail.com	
Club Net:	Each Wednesday at 20:00 on FM on 145.525MHz (S21) ± QRM	
Twitter	@BobFBurns or www.twitter.com/bobfburns	

Next meeting: Friday 6th July 2018

Compact HF and VHF Aerials by Bob G3OOU and Damien 2E0EUI

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

See page 8 for club contact information

Dear Reader

Future Club Meetings and Events

06 Jul 18	M	Compact HF and VHF Aerials by Bob G3OOU and Damien 2E0EUI
03 Aug 18	M	Summer Social
07 Sep 18	M	Introduction to Electronics - Power Supplies by Bob G3OOU
05 Oct 18	M	Practical Session - Building a compact VHF Aerial
02 Nov 18	M	TBA
07 Dec 18	M	Christmas Social
04 Jan 19	M	TBA
01 Feb 19	M	Annual General Meeting

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

06 Jul 2018 - Compact HF Aerials by Bob G3OOU and Compact VHF Aerials by Damien 2E0EUI

The illustrated HF talk looks at the various types of HF aerial that may be implemented in typical small suburban gardens:

It commences by looking at the numerous decisions that must be made in selecting a suitable aerial and then moves on to examine a number of types of aerial that may be made in a full size or more compact form. These includes 'long' wires and 'large' loops, dipoles, multiband dipoles, trapped dipoles, groundplanes, trapped verticals, folded monopoles and a clothes line aerial. The talk finishes by examining feeders.

On display will be the clothes line aerial, some homebrew open wire feeders and a dual Z-Match aerial matching unit covering 1.8 – 146MHz.

The VHF talk will cover the half wave Flower Pot aerial which will feature in a club project later this year. We have also been promised a donation of electronic text books from a local source at this meeting.

Recent Event News

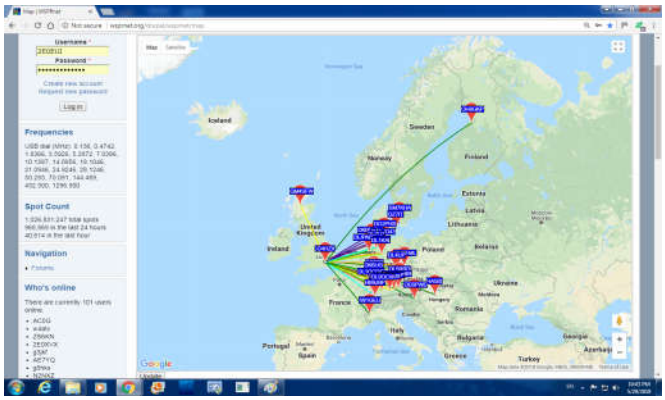
01 Jun 2018 - Whisper (WSPR) Evening - Damien 2E0EUI

Damien explained that WSPR stands for Weak Signal Propagation Reporter and is generally known as Whisper. He explained that unlike normal amateur radio communication, WSPR enables amateur radio stations to participate in a world-wide network of low power beacons. Data received from WSPR beacons is uploaded to a real-time server where signal reports may be viewed using the internet.

Whisper enables radio amateur to ascertain propagation conditions and using WSPRnet (shown below) it is easy to see "open" propagation paths. Damien explained the screen shot presented shows results he obtained on Wednesday 30 May using the 40m band.

Damien's WSPR system is based upon the small WSPRlite 200mW 40m beacon from SOTABEAMS and he noted that apart from examining propagation paths it is also used to ensure antennas are working efficiently.

Using just 200mW Damien has had signal reports from as far away as the US.



Damien noted that although a WSPR station may work autonomously the station may need to be manned to ensure licence conditions are met. In many countries remote or unmanned operation is not allowed, even if the station is totally automated.

During the talk Damien used his loop antenna connected to a WSPRlite beacon (see picture below). He used a laptop PC connected to WSPRnet (using the internet) to see whether his signal was being received. Unfortunately no contacts were made but it was interesting to see how the system is configured.

03 Jun 2018 - Street Party at Overhill Way

On Sunday 3rd June Jim (M0JFL) and his neighbours held a street party and as part of the festivities CPREC set up an HF and a 2m VHF station. Damien 2E0EUI, Steve 2E0DIZ and myself were present although we thought a few more members might have come along considering how nice the weather was.

We used Jim's HF rig, a Yaesu FT450D connected to an 80m Windom. The 2m VHF set was a small KT-8900 transceiver which Steve brought along and we connected it up to Jim's colinear aerial.

A few local contacts were made on VHF but the HF bands were very poor. We had fun making sure the HF antenna was properly tuned using Damien's antenna analyser. Jim uses a Z match ATU and Damien used the analyser to produce an ATU calibration chart for all the HF bands. Once the Z match was connected to the transceiver via an SWR bridge and using the calibration chart we achieved a 1:1 match on all bands up to 10m and 2:1 match on 6m. We knew our signal was getting out because we made a couple of contacts on SSB but because the QRM was rather poor we had difficulty completing the QSOs.

There was plenty of food on hand, including bacon rolls made by Doris and barbecued burgers and sausages courtesy of Jim's neighbours. In addition Jim's electric tram was a great success with the children, they all loved hanging on to the tram while Jim piloted the "Lugsden Flyer" up and down the garden.

Alan G8NKM and Steve 2E0DIZ

73, Alan G8NKM

Emphasis by 'Theorist'

The music industry has been hit hard by the trend towards streaming services such as Spotify. The number of CDs sold annually has dropped as a consequence, and the remaining buyers tend to be the older members of the population who used to buy LPs and like physical media. Classical music has been particularly hard-hit due to declining interest and a huge back-catalogue of performances of all the standard works. Why go to the expense of hiring an orchestra and recording a symphony that has already been recorded dozens of times by great conductors in the past?

Curiously LPs (now called 'vinyls') have made a come-back in recent years. The number sold in the UK in 2017 was 4.1 million, the highest number since 1991, and representing 3% of all music consumed, which includes streaming.

In 1954 the Recording Industry Association of America published an 'equalisation' specification for the recording and playback of what were still called 'phonograph records'. Before this each record company applied its own equalisation. On recording, equalisation progressively emphasises higher frequencies – boosting them - whilst progressively de-emphasising/attenuating lower frequencies (see Figure 1). On playback the inverse is carried out electronically by a 'phono pre-amp'. The high frequencies are suppressed and the low frequencies boosted to restore a natural flat frequency response. This has the advantage that any high frequency noise arising from the vinyl/stylus interaction or a warped record is suppressed.

Fig 1 RIAA Curve Vertical Scale is in dB at 1 kHz

In addition de-emphasis of lower frequencies reduces the movement that the cutter needs to make to cut a groove on recording, and the mechanical forces on the stylus that would occur during playback, and which might cause damage to the stylus or groove, as well as introducing extra distortion. This means more grooves can be fitted on the record giving a longer playing time. However a downside is that any low frequency 'rumble' from the turntable will be amplified on playback emphasis, which can be reduced by good turntable design.

One issue with modern Hi Fi amplifiers is that they generally do not have a phono input with a built-in pre-amplifier. You cannot simply take the turntable output and feed it into a standard line input on the amplifier because of the RIAA curve, not if you want undistorted sound anyway. A few modern turntables apparently have a pre-amp built in, but the Hi Fi enthusiast will probably buy a dedicated pre-amp unit that sits between the turntable and amplifier, or seek out one of the few available amplifiers that still has a phono input.

I have a very large music collection which includes a hundred or so legacy LPs, and have always had a reasonable Hi Fi system on which to play them. The first amplifier I bought as a student in the 1970s was decidedly low budget, and used op-amps in the pre-amp stage. This was somewhat frowned upon as audio op-amps had a reputation for noise and a low slew rate, which is effectively the response time to changes in input. My current newish amplifier also has a built-in phono input which works well and also uses op-amps.

Fortunately modern audio op-amps are vastly different from their predecessors and greatly improved. I have been looking at them recently in the context of pre-amp design because I noticed a pre-amp on sale at Richer

Sounds for £349, down from £399. This seemed more than a little bit on the expensive side: you can get a very decent amplifier for that amount with a built-in pre-amp. They did have cheaper units though, including one for about £25 which only catered for the common moving magnet cartridges and not the rarer and generally much more expensive moving magnet type.

This variation in price made me wonder exactly what was in these units assuming that they all use op-amps, which I think is highly likely. It also made me wonder how easy it would be to construct one, and whether it would make any significant improvement to my system if I did. There are a fair number of enthusiasts who have made pre-amps and published the details on-line. All the ones I could find used modified reference designs published by Texas Instruments, and used very low noise TI chips. The requirement is to provide a gain of about 30 – 40 dB at 1kHz, follow the RIAA curve and (obviously) have low noise and distortion.

There seem to be two basic approaches. The cheapest an easiest, and which according to a TI document I found is apparently used in most commercial pre-amps, is based on the circuit shown in Figure 2 (one channel shown) which is from TI.

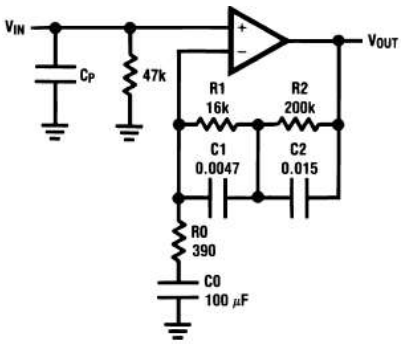


Figure 2

Better is to use the circuit used in Figure 3 (again one channel shown below).

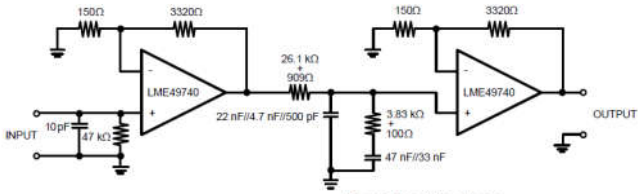


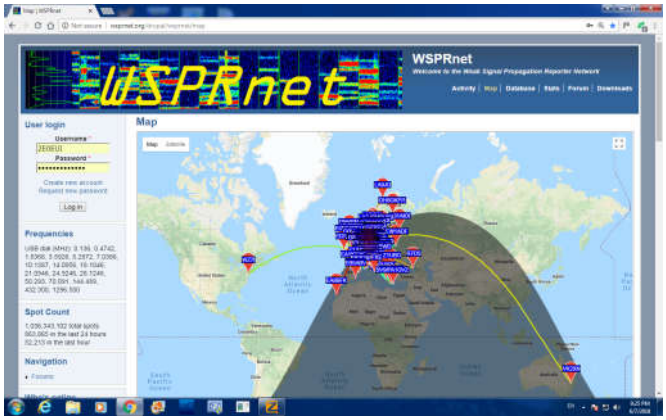
Figure 3 Two Stage Design

This is taken from the TI data sheet for the LME 49740 which is a 14 pin IC containing four op-amps, so only one of these chips is needed. The arrangement is an initial linear input gain stage followed by an RIAA filter (the resistors in series and capacitors in parallel) and then a second linear output gain stage. This two stage amplification means that each op amp is working well within its capability, not trying to amplify too much in one go. It took me a while to realise that 22 nF//4.7 nF//500 pF meant three separate capacitors in parallel and that 26.1 kΩ + 909 Ω meant two separate resistors in series (27.009K). You can judge from this how familiar I am with looking at circuit diagrams. I do know something about op-amps though, and the specification for this chip looks absolutely fantastic compared to what was available in the 70s. However audio purists would no doubt want to use four separate single op amp packages rather than a single chip.

Both of these circuits use passive rather than active equalisation. It almost goes without saying that pre-amps should be shielded from stray signals by enclosing them in a separate metal box as noise introduced here will be amplified throughout the signal chain.

Members News

Damien has sent in a screenshot from his WSPR greyline operations on 14MHz using 200mW and wsprlite:



The most distant reports in this picture were from WZ7I in USA and VK2XN in Australia.

Technical Snippets

a) Programmable Oscillators: If you want to construct a stable VFO for a transmitter or receiver you could review the Vackar VFO article on the Technical website. However, the SI570 clock generator from Silicon Labs is an ideal and probably easier candidate to consider. This eight pin surface mount IC contains a crystal oscillator, programmable dividers and phase locked loop to provde a stable output over a wide frequency range.

The IC is controlled using a two wire I^2C bus and a PIC, Arduino or similar low cost processor for which example software is available via the Internet.

Although the sideband noise is higher than from a Direct Digital Systhesis (DDS) IC, the SI570 does not suffer from low level spurious responses. A fine frequency control pin provides a facility for narrow band frequency modulation.

A family of devices cover 10MHz to a range of maximum frequencies from 160MHz to 1417MHz. The lowest frequency range device typically costs £10 + VAT.

A related family of devices, the SI5351, contains three or eight separate phase locked loops and their respective output pins. Farnell list the lowest frequency version covering 8KHz to 160MHz with three separate outputs for 78p + VAT for one off.

Perhaps this would make an interesting club project?

b) Receiver/Transceivers: There are many types of receiver designs ranging from regenerative, direct conversion, single or multiple superhets to all digital signal processing. As always, you 'gets what you pays for' so you should not expect high performance from something that is extremely simple. Nevertheless making a very simple receiver work

sets you off on the home construction path leading to higher confidence and more complex projects.

As mentioned earlier in this publication, the availability of low cost microprocessors and clock generators gets round a lot of the problems in making stable tuneable oscillators for receivers and transceivers and there are a number of low cost kits that you can purchase and build at home.

The choice then reduces to deciding on a suitable receiver architecture that can be used in reverse for a matching transmitter.

- Regenerative or reaction detectors can provide sensitive performance on the lower HF bands but they are difficult to adjust and their performance is affected by aerial coupling and incoming signal level. Modes are limited to AM, CW and SSB and nothing there that can be easily used for transmission.
- Direct conversion receivers convert the incoming signal direct to audio so are a simple type of superhet and can provide good results at fairly low costs but are limited to CW and SSB modes so fine for HF band operation. The local oscillator may be used on transmit but must be offset for CW.
- Superhets which convert the incoming signal to an intermediate frequency prior to detection are the most common type of receiver and can provide good to excellent performance over a very wide range of frequencies. A lot of the design process hinges on the modes that you require. On the HF bands, CW and SSB are the most popular modes in use wheas on VHF FM is probably the most used mode for local contacts and CW/SSB for longer distance contacts. Your choice of modes will determine the type and number of filters that will be required and the intermediate frequencies that may be used.

  The local oscillator, IF filter and BFO may also be used on transmit but the BFO must be offset on CW receive.
- Digital signal processing is moving on rapidly. Initially it was used to provide gain and signal detection at the very low frequency, typically 20-30KHz, back end of the receiver but has now advanced to provide nearly all receiver functions - for example see the Icom IC7610 which uses direct digital sampling from the incoming frequency up to 60MHz. The digital signal processing circuits may also be used to generate the transmitter signal but a separate power amplifier will be required on transmit to obtain the required output power.

If you select the superhet option then you must decide how many frequency conversions to use and whether the first conversion is to a frequency above, within or below the range of required bands.

- Conversion to an IF above 30MHz significantly eases image frequency problems but requires higher frequency local oscillators and more complex filters. Filters at these frequencies are often called roofing filters and have a bandwidth equal to the maximum bandwidth mode to be used. Frequencies are typically 35MHz, 37.5MHz, 45MHz or higher. A further frequency conversion will usually be required to a frequency where adequate selectivity for each mode and gain can be more economically provided.
- Conversion to a mid range intermediate frequency, for example 9MHz, is common and filters can be made or purchased for most modes. Other well used frquencies are 8.867MHz, 4.915MHz and 3.2768MHz where ladder filters are easy to construct but the maximum bandwidth may be insufficient for FM on the lower frequencies.
- Conversion to lower frequencies like 1.4MHz or 455KHz is perfectly possible and filters are easily available but suppression of the image frequency become a lot more difficult on the higher frequency bands.

A receiver would make an ideal club project but agreement on the architecture to use might require a considerable amount of discussion!

Further reading is recommended using the RSGB or ARRL Handbooks, available new from the RSGB and second hand from many radio rallies.

Already having three 37.5MHz filters in stock I ordered some 37.5MHz fundamental mode surface mount crystals from a Far Eastern source to build some experimental roofing filters. This frequency is useful as it is almost the geometric mean of 30MHz and 50MHz and therefore more applicable for a rig covering both the 10m and 6m bands compared to 45MHz.

More to follow next month.

c) Modern Semiconductor Devices: Gallium Nitride (GaN) is the material of choice for the latest series of high power RF semiconductors. Qorvo have just announced the QPD1025 dual transistor which has a linear gain of 22.5dB, 1.86KW output power from 1 - 1.1GHz and runs from a 65v supply.

Qorvo have also just announced the QPL9095 low noise amplifier covering 500-1000MHz with a gain of 24dB and a noise factor of 0.6dB.

More information from https://www.qorvo.com/

A number of semiconductor manufacturers supply high power GaN transmitting devices that will run from 28V, 50V or 65V DC supplies. Using a 1000W device throttled back to 400W output would provide a very low distortion output spectrum and be very close to failure proof subject to removing typically 400-500W of dissipated heat away from the device.

Miscellaneous

a) GDPR: The following text has been placed on the club web site:

'*On 25th May 2018 the EU General Data Protection Regulation will come into force. This requires that organisations that hold data that could be used to identify an individual conform to certain regulations. This will affect CPREC, and the purpose of this page is to explain what this means to us as a club, and to you as a member*

or visitor. It is our understanding of the GDPR at the present time, and so some of what follows may change. Not all of the requirements are applicable to us as we do not use your information for any purpose other than to contact you about forthcoming lectures and activities concerning the club.

The data we hold on individuals is some or all of the following: Name and address, email address, telephone number(s), membership status (paid up or not), call sign. If you become a member of the club you are implicitly agreeing that we hold your name and membership status as a minimum as otherwise the club could not function. However you have the right to see what data we hold, to ask that data be deleted, the right to be 'forgotten' on leaving the club (all data deleted), and the right to correct any incorrect information we hold. This can be done by sending an email to crystalpalaceradio.club@gmail.com

The data is only used to contact you about forthcoming talks and activities concerning the club, or to ask you about your future membership status. We do not share your data with any other organisation and the only people who might see and use your data to contact you are members of the committee.

Data we hold about you is held securely in an encrypted form. Only the secretary and the newsletter editor have copies of the data although they may share information held with other members of the committee if necessary.

Data is held for as long as you remain a member of the club and for a period of not more than 5 years after that, although you may ask for all your data to be deleted at any time after you leave the club.'

This has also been sent to all club members to advise them of the data which the club holds and the purpose for which it is used.

b) Contest Operation: I spent two to three hours taking part in the CQ WPX weekend long CW contest during the late evening of Sunday 27 May and made 62 contacts.

One interesting characteristic of operation during the evenings before and after sunset is grey-line propagation. The 'grey-line' is a band around the Earth that separates daylight from darkness and propagation along this line is very efficient. One major reason for this is that the D layer, which absorbs HF signals, disappears rapidly on the sunset side of the grey line, and it has not yet built upon the sunrise side.

As the evening progressed, the ten and fifteen metre bands became much less active but suddenly contacts could be made with some countries that were thousands of kilometres away.

Best contacts were PZ5 (Surinam), VP5 (Turks and Caicos), FY5 (French Guiana) and 8P5 (Barbados) all on 15m, YW4 (Venezuela) on 10m and YV8 (Venezuela) on 15m. I also contacted stations in USA, Canada, Greece, Morocco and Europe on 10, 15 and 20m. The highest serial number (QSO count) heard was 4300.

This contest is a good test of your receiver dynamic range as stations fill the CW end of 20m in the evenings spaced less than 1KHz apart and with S9+20dB signal levels. Most of the time I had to use a 250Hz wide filter and occasionally a 100Hz filter. My Icom IC-7400 uses digital signal processing to provide the back end selectivity and the filters show very little sign of ringing.

There are SSB and RTTY versions of this contest earlier in the year and all have different sections based on transmitter power and the number of operators/teams in your station. 100W is described as low power. Scoring is based on a points per QSO, which differs by location, multiplied by the number of unique prefixes contacted. Stations may be contacted once on each band for points but prefixes may only be counted once across all six HF bands.

These contests bring out a host of unusual prefixes and some contest groups make a point of travelling to unusual locations that have little or no regular amateur radio activity, so ensuring that they are in constant demand.

c) Team Work: Most radio clubs have a small percentage of members who possess a variety of specialist skills and facilities from mechanics to electronics. If we could bring these people together into one team then multiple clubs would reap the overall benefits.

I have been very fortunate in the past to work with a few teams where co-operation was high and egos well under control or non-existant so the team output was of a consistently high level.

Could we implement this concept with other local clubs for the benefit of all radio amateurs? An attempt to bring local clubs together in a similar manner two or three years back failed dismally, probably due to suspicions of poaching members. We should be all able to do better than that!

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.

For Sale

a) Remaining items donated for club use or club funds by two Norbury residents:

- Four text books: '*HF Communications - A Systems Approach*' by Nicholas Maslin, '*Communications Systems*' by Simon Haykin, '*Telecommunications Engineering*' by Dunlop & Smith, '*Introductory Topics in Electronics and Telecommunications - Modulation*' by F R Connor. £1 each.
- Gould Digital dual beam 20MHz storage scope type 4035 with manual on CD, working, £30.

Offers to our Chairman Damien on 07900 242541 or email Gorby928(at)gmail.com.

CPREC has a large bank of fundamental and overtone quartz crystals, from 1.0 – 99.91MHz. The list, which is on the club website as a downloadable PDF file, has recently been updated with new frequencies and case

classifications and sorted in frequency order. Prices are £1 each to club members and £2 each to non members, excluding P&P.

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G3OOU

Diary of External Events

29 Jul - Chippenham & DARC Rally, Electronics Fair & Car Boot Sale

Kington Langley Village Hall & fields, Church Road, Kington Langley SN15 5NJ. Opens 10am (disabled 9am), entry £2, car boot sale, catering, flea market, SIGs, talk-in, trade stands. Contact Brian Tanner, G6HUI on 0772 224 2741 or rally@g3vre.org.uk

19 Aug - The RATS (Rugby Amateur Radio Society) Rally

Princethorpe College, Princethorpe, Rugby CV23 9PY. Open 10am to 4pm (8.30am for vendors). Entry £3, car boot sale and catering on site. Tony, G0OLS, 0775 968 4411, rally@rugbyats.co.uk or www.rugbyats.co.uk

28 - 29 Sep - 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, disabled facilities, trade stands, Bring & Buy, car boot area, flea market, SIGs and RSGB bookstall. Representatives from the RSGB Services and committees. Morse proficiency tests, on-site catering outlets and a seating area. Information from www.nationalhamfest.org.uk

12-14 Oct - 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. Principal sponsor Martin Lynch & Sons. www.rsgbevents.org.

18 Nov - 41st CATS Bazaar

Oasis Academy Coulsdon, Homefield Rd, CR5 1ES Coulsdon. £1.50 entry and plenty of free parking! Applications from traders, clubs and private sellers most welcome. Contact bazaar@catsradio.org or ring Andy G0KZT on 07729 866600.

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.

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/

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

17 July	A Technical "Show and Tell"
21 Aug	Operating and Social
18 Sep	Aerials by G4WGZ

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

03 Jul	Three Short Talks
07 Jul	Constructors Competition
04 Sep	999 Emergency Communications - G3ZPS

Coulsdon 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/

09 Jul	Evening on the Air/Social -- Details to be confirmed.
13 Aug	CATS BBQ @ G4CDY QTHR

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/

27 Jun	Meteor Scatter by Mike Davies G0KAD
25 Jul	QE2 Communications by Duncan Brooker
26 Sep	Surplus Equipment Sale

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

5 July	SOTA for beginners – Richard G8ITB
19 Jul	Les Minquiers IOTA DXpedition + natter night – CVRS IOTA team
28 Jul	Annual BBQ + G1RCV activity in IOTA contest

Dorking & District Radio Society

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

24 Jul	South Downs Evening
Aug TBA	Summer Social
25 Sep	Small transmitting loops by Prof. Mike Underhill G3LHZ
23 Oct	Practical evening - Making antenna traps by Tom Ellinor G4DFA
27 Nov	AGM & RSGB Video

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 or 01784 451898.
Web site: http://www.qsl.net/g3ues/index.htm

28 Jun	TBA -or- On-Air / CW Practice / Bring & Buy / Natter Night
1-2 Sep	High Power Field Day

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/

25 Jul	Bring & Buy Sale
22 Aug	Construction Contest
26 Sep	Photos Presentation by Alan Harding

Hereford Amateur Radio Society
Meets on the first Friday of each month at Hill House, Newton, Nr Leominster, HR6 0PF. Contact: enquiries@herefordradioclub.uk or http://herefordradioclub.uk/

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 or http://www.harc.org.uk/

05 Jul	Amateur Radio: Fact or Fiction? Mike G8CKT

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 or www.msars.org.uk

13 Jul	Chairman's Barbeque
27 Jul	Foxhunt
31 Aug	Foxhunt

South East Essex Amateur Radio Society (SEARS)
Contact Mark Callow 2E0RMT on 07842 336444 or 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.

11 Jul	Terry Genes G4POP - Log40M Software
19 Aug	Special Event - Museums on the Air, Bay Museum Canvey
09 Oct	Andy Tyler G1GKN - Ex military radios in Amateur Radio

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. Web: http://g3src.org.uk/

02 Jul	Annual Barbecue
06 Aug	TBA
03 Sep	Echo Satellites by George Emsden M0TPH

Sutton & Cheam Radio Society
8pm on 3rd Thursday every month. Contact John Puttock G0BWV on 020 8644 9945 or email info(at)scrs.org.uk Web: http://scrs.org.uk/. SCRS run a practical group most Monday evenings at the Bandstead Scout Hut.

20 Jul	TBA
16 Aug	SOTA for Beginners – Richard Perzyna – G8ITB

Please replace the (at) with @ when using any email

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

Local Training Courses

Licence Level	Dates	Location	Club Provider	Format	Further details
Advanced	22 Jul to 9 Sep	Bromley BR2 7NH	Bromley	5 days (Sun)	www.bdars.org
Foundation	07 & 21 Oct	Bromley BR2 7NH	Bromley & District ARS	2 days (Sun)	www.bdars.org
Intermediate	03, 10 & 17 Nov	Eltham, SE9 2SD	Cray Valley RS	3 days (Sat)	www.cvrs.org
Intermediate	17 Feb, 03 & 17 Mar 2019	Bromley BR2 7NH	Bromley & District ARS	3 days (Sun)	www.bdars.org
	= course commenced				

CPREC Committee Information

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