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:	cprec.g2lw@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 7th September 2018

Practical Session - Building a Compact VHF Aerial by Damien 2E0EUI

In this issue: *Future Meetings & Events, Recent Event News, Logically 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

* Please note the following two last minute changes:

07 Sep 18	M	* Practical Session - Building a compact VHF Aerial by Damien 2E0EUI
05 Oct 18	M	* Introduction to Electronics - Power Supplies by Bob G3OOU
02 Nov 18	M	Network Radio by Martin Butler M1MRB
07 Dec 18	M	Christmas Social
04 Jan 19	M	Video Evening
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.

07 Sep 2018 - Practical Session - Building a Compact VHF Aerial by Damien 2E0EUI

Due to a last minute change of travel plans we have had to swap the planned talks for the September and October meetings.

Damien writes: 'At the next meeting we will be attempting to build the 2m / 70cm Flower pot antenna that we discussed at a previous meeting. The aim is to so how easy it is to build a simple working atenna for use on 2m / 70cm and hopefully encourge you all to try it out on the bands.'

This low cost aerial can be made for a single band or using the open sleeve technique with some aluminium foil it can cover an additional band e.g. 144MHz and 432MHz [Editor].

See http://vk2zoi.com/articles/half-wave-flower-pot/

Recent Event News

03 Aug 2018 - Summer Social

This meeting was our Summer Social and Evening On he Air with members contributing food to the buffet.

Thank you to Alan G8NMK for rigging up the club VHF station with the best contact being made to Guildford, a good distance considering the aerial was only a few feet above the ground.

We welcomed visitor Tony Booth to the event.

Playing With Radio (In a Field) by Damien 2E0EUI

A couple of weeks ago I had the opportunity to go and play radio in a farmers field on a hill near Reigate in Surrey. This was the annual summer camp for the Wimbledon District Amateur Radio Society,Special event station GX3WIM.

This event has been run every year but this was my first chance to take part and boy am I glad I did.The summer camp ran from Saturday to the following Sunday. I arrived on the Monday and stayed for two nights (camping) and then came back and stayed for another two nights Friday and Saturday (due to family commitments) but some operators stayed all week or just the odd night.

The main station was set up by John G8MNYs van in an awning and powered by several petrol generators which float charged a lorry battery.This supplied the shack with a steady supply when needed.

John G8MNY in the shack.

The guys from the Wimbeldon club had done us proud with every band covered and usally with more than one antenna to play with on the the band of operation.The main operators were John G8MNY, Steve 2E0DIZ, Andy G4ADM, Kim G6JXA, Eric G0KRT and myself Damien 2E0EUI.

Some of the antennas we had at our disposal were for example:

- a TH33 3 Element Yagi at 56 foot (great for 20m DX)
- 2m 9 elementYagi at 46 foot for 2m FM/SSB contacts.
- A random wire for top band (160m) also a dipole for 80m, a trapped dipole for 40m all at about 40 foot up.
- Also a 7 element yagi for 6m with a V2000 colinar above that for 6m,2m and 70cm and also a 4m vertical on a seprate mast.

ICOM 735 and T500M PA

The main station radio was a ICOM 735 which went through a Transworld T500M PA to give us 400w transmit power.

The main operating / contacts where made during the day (mainly UK and Europe) and at night with the best DX on 20m between the hours of 22.00 – 02.00.(using the 3 element yagi)

We had plenty of contacts on 20m into the USA ,Canada etc and long path to Morocco and Kazakhstan.There were plenty more contacts with all members of the camp taking part.

Some of our other qso contacts included Australia and Japan on 20m, Saudi Arabia and Israel on10m and Bulgaria and Turkey on 6m.

FT690 plus homebrew linear(250w) 6m setup

3 Element Yagi at 56 foot

Several regulars did not Camp this year for various reasons but briefly visited including June and Dave G4RBQ, Graeham G4WNT, Jim G4WYJ, Linda and Colin M0GXV and Alvin G6DTW.

I think all who attended had a excellent time and I for one am really glad I attended as it was great fun and it gave me the opportunity to play with antennas and power that I could only dream of and of course enjoy great company of like minded individuals.

Damien 2E0EUI making dinner

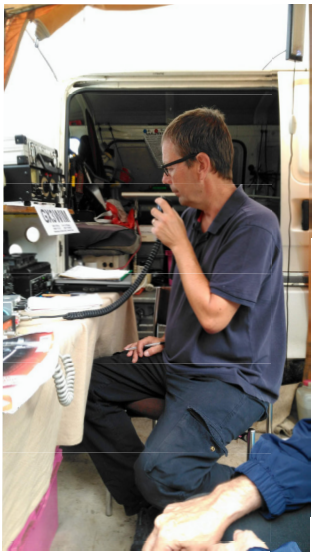
Summer Camp Antenna Farm.

I would like to give my thanks and gratitude to Andy G4ADM for arranging the summer camp and John G8MNY who supplied most if not all of the kit and great with his advice and operating tips and all the other operators and visitors to the camp who made it a cracking week. In all there were 10 members and 7 visitors who visited at the camp.

So if it sounds like your thing why not give it a go next year you wont be disappointed and I for one am putting a date in my diary.(just don't tell the XYL)

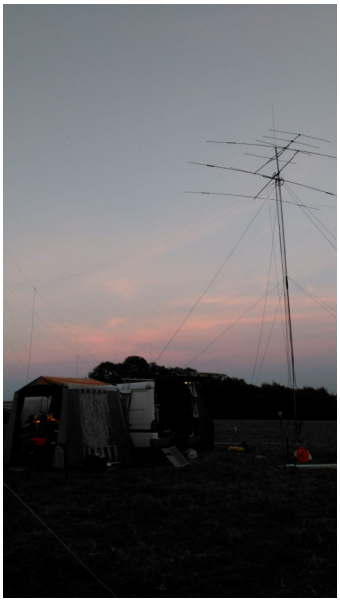
From the logs:

- 160m with 30W/400W had 34 contacts with Dx to CT DL ON OZ PA,
- 80m with 400W saw 98 with Dx to EA F YL,
- 40m saw 126 Dx DL EA EI F GI HB I LA OE OH OK OM ON PA R SA7 SM UA YO YT YU ZB,
- 20m saw 295 some of Dx 3V CT CN E7 A/K/N/W OK R SQ SV TG TK UA UN VE XQ YV,
- 10m saw 19 Dx 4X EC HZ OE SP,
- 6m with 250W we had 21 contacts in 2 sporadic E events Dx 9A EA F I LZ PA YL,
- 4m with 25W end fed dipole at 10m saw 11 QSOs.
- 2m with 50W FM to colinear at 14m / 200W SSB to 9el at 17m saw 52 QSOs.
- 70cms 40W FM Just 1 QSO.



Steve 2E0DIZ (left) on HF and Syd 2E1HAT (right) who visited with (the camera shy) Dave G4IQE (all the way from Essex no less).

Myself 2E0EUI and Kim G6JXA doing some late night DX.



Sunset at the summer camp.

I'd also like to thank Steve 2E0DIZ and John G8MNY for their input as regards some of the finer detail.

73 De 2E0EUI

Logically by 'Theorist'

There are several different types of logic in mathematics. The type that is relevant to electronics and computing is called Boolean, after George Boole, who introduced it in a book he wrote in 1847 called 'The Analysis of Logic'. Technically it is an algebra in which the only values allowed are True and False (or if you like 1 and 0), and the main operations that can be performed on the values are 'AND', 'OR' and 'NOT'. For comparison in normal algebra the values are numbers and the main operations are addition and multiplication. Since Boolean algebra uses 1 and 0, the implications for digital electronics should be obvious, not least because a transistor can be on or off.

Indeed in 1930 an engineer called Akira Nakahima independently re-invented Boolean algebra, of which he was not aware. He was working for NEC on switching circuits, and found a way to use it to design circuits in terms of 'logic gates'. Claude Shannon picked up on this in his own work on switching circuits whilst working for Bell Labs. Today cheap DIL packaged logic gate chips are readily available.

The three basic logic operations referred to above are a minimal set, since all other so-called 'secondary operations' can be constructed from them. If you were wondering what happened to subtraction and division in the normal algebra description above, it is that they are secondary operations that can be represented in terms of addition and multiplication. As is typical, mathematicians use a variety of different symbols to represent each operation in order to confuse the layperson, but I will stick with using ^ for 'AND', ˅ for 'OR' and ¬ for 'NOT', a common notation.

The ^ operation takes two inputs (0 or 1) and outputs a 1 if both inputs are 1, but gives a 0 if one or both of the inputs is 0. The ˅ operation takes two inputs and returns a 1 if at least one of the inputs is 1, returning a 0 only if both inputs are 0. The ¬ operation takes only one input and changes it so that ¬1 gives 0, and ¬0 gives 1. The NOT operator is in effect an inverter. Conventionally results like these are displayed in a so-called Truth Table, an example of which is shown nearby.

The ˅ operator needs some comment. In English if you asked somebody 'would you like tea or coffee' you would not expect the reply 'both', although you might get the reply 'neither', since English is idiosyncratic and definitely not mathematical. In strict logic there would be three allowable answers to the question, namely 'tea', 'coffee', and 'both'. The ˅ operator is sometimes called the *inclusive or* operator for this reason. If you want to exclude the answer 'both' you would need to use the *exclusive or* (EXOR) which is often given the symbol of a plus sign with a circle drawn round it, which my word processor does not allow me to type, so I will use Θ.

The Θ operation returns a 1 if both inputs are different, but a 0 if they are the same. The Θ operator is an example of a secondary operation since it can be constructed from the three basic operators as follows: x Θ y = (x ˅ y) ^ ¬(x ^ y) and so could be implemented electronically using chips that implement the basic logic operators.

Of particular importance to digital electronics is the NAND (not AND, or ¬^) gate. It negates the AND operation and thus gives a 0 if both inputs are 1, and a 1 if both inputs are 1 or different. It is important because any boolean expression can be represented entirely and

only by a combination of NAND gates including the basic operations, a property called functional completeness. And *that* is extremely important in terms of manufacturing because in the most widely used CMOS technology only 4 MOSFET transistors in one layer are needed to implement a NAND, but 6 transistors in 2 layers are needed to implement an AND or an OR. This increases the packing density and delay as well as using a more complex and expensive manufacturing process. It therefore makes economic as well as logical sense to have a chip where all the logic gates are one type - NAND gates, which can be used to implement any function. It also makes the chip design simpler. Note also that the NAND gate has a NOT function already implemented, using only one of the two inputs. As a smartphone can have more than 2 billion transistors in it all these factors are very important.

For the sake of completeness NOR (not OR) gates also have functional completeness and could be used in place of NANDs. However NAND gates are preferred for a variety of technical reasons including the fact that for the same delay time NAND gates can be made ever-so-slightly smaller. Only a function with a NOT capability can have functional completeness since otherwise the NOT function cannot be represented.

NOT gate	
A	$\overline{A}$
0	1
1	0

INPUTS		OUTPUTS					
A	B	AND	NAND	OR	NOR	EXOR	EXNOR
0	0	0	1	0	1	0	1
0	1	0	1	1	0	1	0
1	0	0	1	1	0	1	0
1	1	1	0	1	0	0	1

Clarification. In my last article I should have made it a bit clearer that the speed of light given in the textbooks is the speed it travels at in a vacuum. This is the maximum speed that light and thus all electromagnetic radiation can travel, and nothing can pass you faster than this speed, nor can information/messages be sent to anybody faster than that speed. An interesting problem arises if you consider the rotating beam of light given out by a lighthouse. As you go further away from the lighthouse surely the beam must sweep round faster and faster, so that if you went a sufficient distance away it would exceed the speed of light. Wouldn't it?

[Anyone care to do the maths - Ed?]

Members News

a) New club email address: Our webmaster Nick has created a new email address on the club web site which is cprec.g2lw@gmail.com.

b) Club Net: Considering the number of licenced club members the weekly net on 145.525MHz is very poorly attended. Can anyone suggest a better day, time or band to increase attendance?

c) Jim M0JFL has been testing his HF station and aerial and puts in an S9 signal in Coulsdon on 80m SSB.

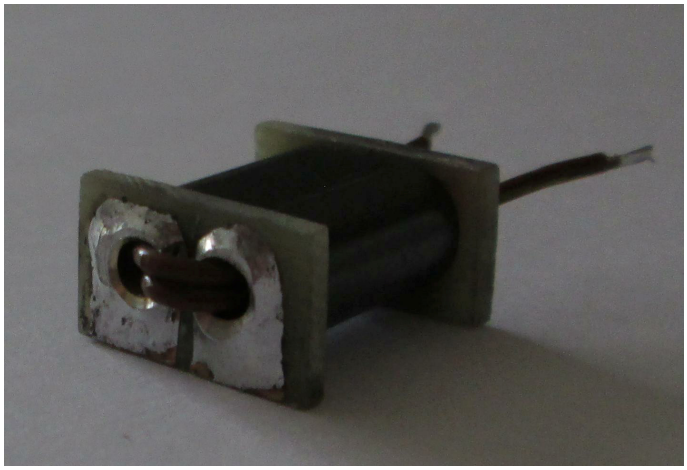
Technical Snippets

a) Quartz Crystal manufacturer IQD has just announced the development of fundamental mode crystals in hermetically sealed packages up to 200MHz.

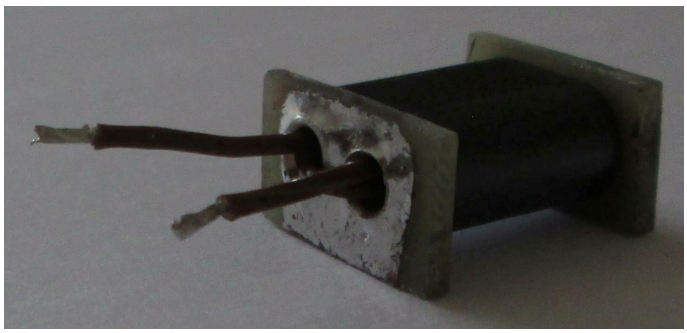
b) Broadband Transformers: Balanced mixers and solid state HF power amplifiers rely on the wide frequency characteristics and low losses of this type of transformer. They are usually ferrite cored and very low impedance windings can be made of brass tubing with the other winding inside the tubing. PTFE coaxial cable may also be used to obtain very tight coupling between the primary and secondary.

The home made transformer shown further on consists of two windings, a one turn primary made from thin walled brass tubing and a two turn secondary wound with PTFE insulated wire. The core is a two holed (binocular) type, number BN43-0202 and the completed structure is approximately 0.7" (18mm) long. The first photo below shows the low impedance one turn end and the second photo shows the higher impedance two turn end.

The brass tubing is soldered to the single sided PC board copper surfaces at each end, filed down smooth and then deburred with counter sink bit. The two turn winding may then be put in place. One of the PCBs has the copper area separated with a small gap, the other PCB copper surface is continuous.



PTFE insulation is required to prevent it softening or melting during construction (soldering) and operation. This type and size of transformer may be used to drive a pair of push-pull output devices from a single



ended driver or in the collectors/drains of those output devices to drive a single ended 50ohm load up to about 20 watts. Higher power will require a larger core and designs are available up to at least 1KW.

The completed transformer is soldered down on the surface tracks of the power amplifier board and lacing twine or a tie wrap may be used for extra mechanical

stability. The bandwidth should be adequate to cover 1.8 - 50MHz with a single parallel compensation capacitor on each collector/drain winding.

c) Ladder filters update: Some additional work has been carried out on the effect of placing a capacitor in series with a ceramic resonator or quartz crystal used in a ladder filter. This was required following some unusual measurements on a 37.5MHz filter whose crystals had been raised in frequency with series connected capacitors.

One 37.5MHz crystal was connected in series with a 15pF capacitor and the complete circuit measured as a black box. The process was repeated with a 455KHz ceramic resonator connected in series with a 150pF capacitor. The results were entered into a crystal modelling package to determine the equivalent internal parameters.

These parameters were then entered into a filter design package using an eight section 0.5dB filter model. The main effect of the additional series capacitor was to significantly reduce the equivalent value of the motional capacitor resulting in a considerable reduction in the maximum possible bandwidth when used in a ladder filter. The unmodified ceramic resonator would provide a ladder filter maximum possible bandwidth of around 9KHz but with the additional series capacitor the maximum bandwidth had reduced to around 3KHz.

In the case of the 37.5MHz filters, detailed modelling shows that:

- the default centre frequency of the narrow filter at 37.489MHz can be moved up to that of the wide filter at 37.494MHz
- Both filter centre frequencies can be moved up to 37.500MHz whilst retaining the original 7.5KHz and 15KHz bandwidths

d) New motherboard battery: My PC suddenly started behaving eratically with random dates and times appearing after a cold start. The problem turned out to be an almost flat clock backup battery on the motherboard - the 3 volt CR2032 button cell was down to 0.5 volts which was extremely good going considering the motherboard is nine years old with the original battery. The processor is an AMD type running at 2.8GHz with 8GB of memory, 1.2TB of hard disk space and running a 64 bit version of Windows 7 Professional. The processor is cooled using a heat pipe to conduct heat to the rear heatsink.

Each year the PC is disassembled and vacuum cleaned to remove dust from the numerous heat sinks and case alcoves. It helps to check the fans as well, particularly in colder temperatures when they can be slow to start.

UK Amateur Radio Licence Training:

Syllabus 2019 is now available in four files: Foundation, Intermediate and Full as well as a combined document. Comparison documents prepared by the Exams Group also help explain changes from the previous syllabus. Find all of them on:
https://rsgb.org/main/clubs-training/tutor-resources-2/syllabus/

Miscellaneous

a) Crystal Palace Subway will be paticipating in the Heritage Open Day on Saturday 8th September 2018. More information from their wensite at:

http://www.cpsubway.org.uk/

Heritage Open Days 2018 will be 6-9 & 13-16 September.

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 ono.

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.

73

G3OOU

Diary of External Events

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

Entrance tickets may be purchased online with a card from www.nationalhamfest.org.uk. Rail travel tickets are a lot cheaper if purchased well in advance. Taxis are available from the local railway station for around £5 per journey.

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.

27 Ooct - Essex CW Club Boot Camp

3rd Witham Scout & Guide HQ (rear of Spring Lodge Community Centre), Powers Hall End, Witham, Essex, CM8 2HE. Opens 8.30am for registration, session runs 9am-4.30pm. Free parking, entry £10, free snacks. Contact Andy, G0IBN, 0745 342 6087 or info@essexcw.org.uk
Web: [www.essexcw.org.uk].

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/

11 Oct	Practical Radio Astronomy for Amateurs Talk by Paul Hyde
08 Nov	Junk Sale
13 Dec	BRATS Christmas Party 2018

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

18 Sep	Aerials by G4WGZ
16 Oct	SDR / Construction
20 Nov	TRF / Construction by M0YRG
18 Dec	Quiz and Mince Pies by G0HIQ

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

04 Sep	999 Emergency Communications - G3ZPS
02 Oct	CARS AGM
06 Nov	Propagation by Gwyn Williams G4FKH

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/

10 Sep	TBC
08 Oct	Inter-Club quiz -- To be confirmed with SRCC
12 Nov	Apollo 13 - Terry G4CDY
18 Nov	CATS Bazaar

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/

26 Sep	Surplus Equipment Sale
28 Nov	HARC/CARC Challenge
07 Dec	Annual Fish and Chip Supper

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

09 Sep	35 Years as an Amateur Radio Journalist by Don Field G3XTT
20 Sep	EME DXpedition to Belize by Iain G4JMM
04 Oct	Annual surplus 'junk' sale

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

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

1-2 Sep	High Power Field Day
27 Sep	Adventures at 50 MHz - Phil Miller Tate, M1GWZ
26 Oct	'Hernia Cup' Quiz night - St Mary's Church, Sunbury - Note that this is in place of the normal Thursday night meeting.
08 Nov	Weather Satellites & Earth Images - David Simmons, G1MAL & Francis Bell, G7CND

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 Sep	Photos Presentation by Alan Harding
24 Oct	I Was A Cold War Spy by Alan Spiby
28 Nov	DVD Show by Tony Lunn G0EYE

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/

07 Sep "Show and Tell" – members bring equipment in to talk about it.
05 Oct Poss. demo. of 3D printing. Nigel (G4XTF).
02 Nov The 'L' Band Matrix – Mike G3LZM.

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/

06 Sep I was a cold war spy by Brian Browby
04 Oct Club - Junk Sale
25 Oct HARC/CARC Challenge - Crawley Club (Provisional – TBC)
01 Nov Space Project - Dr Chris Bridges TBC

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

31 Aug Foxhunt 4
14 Sep EGM
12 Oct AGM
02 Nov Surplus Equipment Sale - UPSTAIRS
23 Nov Construction Contest

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.

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/

03 Sep Echo Satellites by George Emsden M0TPH
01 Oct Autumn Surplus Equipment Sale and Special Catalogue Sale
05 Nov Inter-club Quiz
03 Dec Construction evening

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 Sep TBC
18 Oct Solar power for Radio Amateurs Milton G1RUV
15 Nov Receivers Over the Ages by Bob G3OOU

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

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 - 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 - 25 Nov	Eltham, SE9 2SD	Cray Valley RS	3 days (Sat)	www.cvrs.org
Foundation	02 - 09 Feb 2019	Eltham, SE9 2SD	Cray Valley RS	2 days (Sat)	www.cvrs.org
Intermediate	17 Feb - 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
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