

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 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 1st December 2017

[Christmas Social](#)

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

Dear Reader

I am sorry to advise you that two club members have become silent keys:

David Eaton G3TAO died in October 2017. He had been a member since 2002 but had not renewed in 2017 because of illness. Geoff Godfrey attended his funeral.

Victor Johnston G1PKS died on 4th November at St Christophers Hospice. Victor had been an active member of our club since joining in 1990, serving as Secretary, Auditor, Training and Examination Manager, helping with the organisation of our Spring Sales and outside visits, acting as chef at our summer barbecues and giving talks on his experiences in the RAF in WWII and with older style radios.

The funeral took place at 10:30am on 20th November at St Johns the Evangelist Church, Auckland Road. My XYL Cathy represented the club in my place as I was recovering from surgery.

Future Club Meetings and Events

01 Dec 17	M	Christmas Social
05 Jan 18	M	Video Evening
02 Feb 18	M	Annual General Meeting
02 Mar 18	M	Club Projects
06 Apr 18	M	'The British Vintage Wireless and Television Museum'
04 May 18	M	Whisper (WSPR) Evening
01 Jun 18	M	Introduction to Electronics - Power Supplies
06 Jul 18	M	Practical Evening
03 Aug 18	M	Summer Social

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

01 Dec 2017 - Christmas Social

This will be a non-technical social evening and member's partners and other visitors will be most welcome. Please bring a contribution of food for the buffet, just sufficient for yourself and any associated friends and colleagues. We have facilities for heating pre-cooked food but insufficient time for full cooking.

A full programme of meetings to August 2018 is now in place. The March 2018 meeting will consider the next steps in the three club projects for which it would help to have some discussions prior to the meeting so as to make best use of the available time.

The June 2018 meeting will look at the issues involved in designing and constructing power supplies.

Recent Event News

03 Nov 2017 - Millimetric Microwaves by Chris G0FDZ

Chris talked about his collection of microwave stations, the problems encountered during their construction and operation and explained the general arrangement of each one.

This event was a bit of an eye opener for those club members accustomed to thinking in terms of half wave dipole aerials for the HF bands with lengths from 16 feet up to 264 feet. At these microwave frequencies, a dipole is not very practical to construct because of its small size and coaxial cable can be too lossy. For example, semi-rigid coax cable and SMA connectors are just usable up to 24GHz but above that a different approach to feeders and aerials is required.

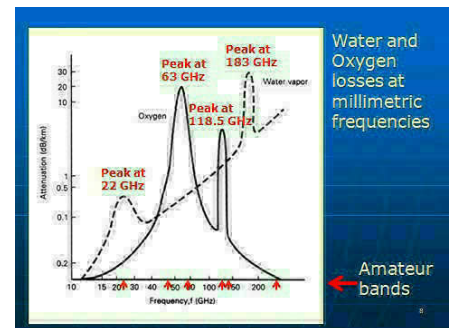
Feeders are usually waveguide, in rectangular, circular or elliptical format, which at 241MHz are of extremely small dimensions. Waveguide has a high pass frequency response so by choosing the right size, it can be used to attenuate signals well below the frequency of operation, saving on output filters. Aerials take the form of horns or dishes with a suitable launcher. Horns may be fed directly with waveguide.

Bi-directional mixers for receive and transmit use the anti-parallel format with two diodes in parallel, one the opposite way round to the other. This also allows the use of sub-harmonic local oscillator injection, typically at half the required frequency but possible down to one seventh. IFs of 144MHz, 432MHz and 1296MHz may be used.

SMT components are the norm at these frequencies with the mixer diodes being fixed down with a silver epoxy adhesive which is cured at 100°C for an hour.

Propagation is directly affected by the presence of watervapour and oxygen so best conditions usually occur when it is cold and the humidity is low. Humidity may be measured using wet and dry bulb thermometers and some

electronic instrumentation. The right hand diagram shows typical atmospheric attenuation against frequency.



Computer software can be used to calculate path losses if conditions can be measured and entered into the programme - see software by G0MJW etc. The K factor (refractive index) is typically 1.3 but a value 1.0 is usually used in calculations. For example the path between Willington Hill and the Isle of Wight is just possible to use at a distance of 110Km. Microwave communications is better over the sea than land.

Beacons are operational on 24 and 47GHz using sectoral horn aerials.

Talk back during microwave tests usually takes place on 144MHz where the path and conditions are more predictable.

Note that 1GHz = 1000MHz.

24GHz (wavelength = 12mm) - this is one of the easier microwave bands to get on because there is a lot of ex-commercial equipment available. Homebrew or modified commercial units started out using Gunn oscillators but

now the majority use a transverter usually with an IF of 144MHz from a multimode QRP rig like the FT817 similar to that shown on the right.

DB6NT can supply a a transverter for this band using a sub-harmonic mixer. With a local oscillator of 11.952GHz and an IF of 144MHz the operational frequency will be 24.048GHz. The output power from the mixer is typically 500uW

(microwatts). 2W amplifiers are available for less than £50. Receiver low noise amplifiers (LNA) using GaSFET devices are available at good prices because of their volume manufacture for satellite TV systems,



47GHz (wavelength = 6mm) - the mixer output power is typically 200-500uW. Commercial dishes for 50GHz applications will usually work on this band. The preferred sub-band is 47.088GHz. The picture to the right shows the 76 GHz horn on Chris's 47/76 dual band transverters on the LHS, with his 134/241 dual band transverters on the RHS in the background.



76GHz (wavelength = 4mm) - mixer output is 250uW at best. Local oscillator is 38GHz x 2, derived from a 9.5GHz source multiplied by four. Image reject filters typically cost £150 from Germany. Surplus equipment and parts are available on eBay. The preferred sub-band is 75.976GHz.

'High power' amplifiers of 90mW (milliwatts) and receiver LNAs are available.

A separate 24GHz installation may be used to assist with aerial alignment.

122GHz - high path losses are experienced due to oxygen absorption and little commercial gear is available.

134GHz (wavelength = 2mm) - European interest is high on this band. Mixer output is typically 200uW. The circular waveguide feed hole from the mixer output is typically 1.7mm in diameter.



To minimise drill breakage the hole is first drilled at 1.5mm with WD40 as a lubricant and then redrilled at 1.7mm. If the drill jams and breaks you have to start again with new metal so much care is required.

The picture on the right show the 134/241 GHz transverters mounted on a micrometer driven mount to ease antenna alignment.

1mW on this band is regarded as high power (QRO).

The typical aerial beamwidth is 0.8°

so pointing the aerial in the correct direction is difficult. A 5W LED light source with a Fresnel lense at one end of the path and a rifle sight at the other end helps greatly - you can see the sight on the 241GHz rig above.

The on-board frequency standard is usually at 100MHz but temperature control is not normally required. Receiver bandwidth can be as low as 600Hz but 2.4KHz is better to allow for frequency drift although the CW note is T9.

241GHz (wavelength = 1.2mm) - this is the highest frequency band allocated to UK amateurs. The waveguide aperture is typically 0.8 - 1.0mm in diameter and power output around 10uW. The first QSO took place over a path length of 30 metres.

Readers should note that only UK advanced and intermediate licence holders have access to all of the microwave bands at their respective maximum powers.

Information on microwave activities is available from the UK Microwave Group, RSGB and British Amateur Television Club and commercial amateur radio microwave equipment is available from DB6NT in Germany and Down East Microwave Inc in the United States plus others.

5 Nov 2017 - Kempton Park Rally

Your committee decided not to take a stand at this event so I attended as a visitor. The usual club and private seller stands were present along with the RSGB and Icom UK but none of the other major distributors. One stand, also seen at the Newark Rally, was selling Russian ex-military medium and high power transmitting valves and components with capacitors up to and exceeding 10KV working voltage.

The next radio rallies at Kempton Park will be 15th April 2018 and 4th November 2018.

19 November 2017 - 40th CATS Bazaar

The club had accrued large collection of equipment over the past year and although we attended the Kempton sale in April we still had a lot of items to sell. We hired two tables at the CATS Bazaar and had a very successful day. With the help of Jim 2E0EUI, Mike



G4AHT (Alan's friend), Damien 2E0EUI and Alan G8NKM we made over £280. The sale opened at 10am on Sunday and was well attended. A big thank you needs to go to the Coulsdon Amateur Transmitting Society (CATS) for organising the event.



Mike & Jim



Mike selling DAB radios

Way of Thinking by 'Theorist'

I thought I was done writing about capacitors and the like, but a particularly enquiring member of the club wanted to know more, so I have to postpone the article I had in mind until next month. This time I want to pose three puzzles/problems and then answer them, after giving some information you may need. The three are all about the situation where you have a parallel plate capacitor (PPC) which has been charged and then the battery disconnected, leaving an isolated and charged capacitor.

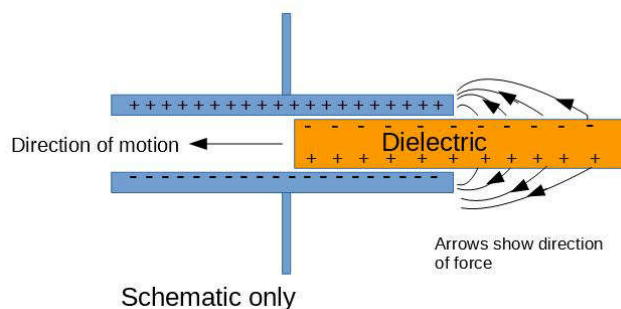
What happens to the voltage, capacitance and energy stored by the capacitor if either – P1: A dielectric slab is introduced between the plates? P2: The separation between the plates is doubled? or P3: The capacitor is connected in parallel to another capacitor? You might like to think about these before reading further, and also re-read the October 'Theorist' article. I am after *qualitative* answers here, not detailed calculations, although if you can do those don't let me stop you. In the meantime here are some things you might need.

First, energy and charge are conserved quantities; you cannot lose either. Second, fields store energy. If you pick up something from the floor and put it on a table (expending some energy in so doing), you will have increased its potential energy. But where is the energy being stored? It must have gone somewhere, and the answer is it is being stored in the gravitational field. You might well ask 'exactly how is the energy being stored?' or 'what is this field thing anyway?' These are perfectly good and valid questions. The answers, such as they are, are very complex and won't be dealt with here. It doesn't matter though, just accept that energy is stored in a gravitational, electric or magnetic field. For a PPC the total energy stored works out as $U = \frac{1}{2} CV^2$ [note 1]

P1: So what happens if you put a dielectric between the plates? Well, as the October article pointed out, the

electric field between the plates will go down, which means that the voltage across the plates drops, and the energy stored drops. The capacitance will go up since $C = q/V$, and the charge on the plates is the same. Where has the energy gone though?

Although I have never seen it happen, and looked (but failed) to find a You Tube video of it, what happens is that as you introduce the dielectric between the plates it is actually pulled into the capacitor. In other words the capacitor expends some energy to pull in the dielectric, and this energy is dissipated. If the dielectric was connected to a weight by a piece of string, the weight would move. A 'diagrammatic explanation' of what is going on is in the following figure.



P2: The plates of the capacitor are charged with opposite polarity. This means that there is an attractive force between them as 'unlike charges attract'. The plates need to be constrained in some way otherwise they would simply pull themselves together due to electromagnetic attraction. Increasing the separation between the plates therefore requires some energy to be expended, and this is stored in the electric field between the plates. Pulling the plates apart creates more electric field! The voltage will increase and the capacitance will drop.

P3: You are effectively using a charged capacitor to charge an uncharged capacitor. When you connect up the second capacitor the charges on the plates will redistribute themselves. This means they will move, creating a current which will flow until an equilibrium is reached. When currents flow they heat up the wires through which they move, so energy is dissipated. This means that the final energy stored by the two capacitors must be less than that stored originally by the single capacitor, and the voltage will drop.

If you work it out properly, the voltage reduction is $V_{\text{final}} = C1/(C1+C2)V_{\text{initial}}$ where $C1$ is the original charged capacitance and $C2$ is the one you connect. You can see that if $C2 \ll C1$, there will only be a small voltage drop. If a large value capacitor is connected, $C2 \gg C1$, then the voltage drop will be large. In the particular case where both capacitors are equal, the voltage will drop by half. The charge will be shared equally between both capacitors, so the charge on both will be half that of the original capacitor. The capacitance of both $C1$ and $C2$ will thus be the same as $C1$ before connection, so the total capacitance of the system will be doubled; you might think this is obvious. The energy stored by each capacitor will be $\frac{1}{4}$ the original energy stored by $C1$, but there are two capacitors so that the total energy stored will drop by a half. So *half* the original energy stored in this case has been dissipated.

Finally, as you know, the Farad is a preposterously large unit. For a PPC the capacitance depends only on geometric factors and is given by the following equation: $C = \epsilon_0 A/d$ where A is the area of a plate and d is the distance between them. Rearranging, you can work out what area would be needed to store 1 Farad if the plates were 1mm apart. This works out as $1.13 \times 10^8 \text{ m}^2$ or 43.6 square miles!

I 'think physics' but do not really 'think electronics'. If you have a different way of thinking about these problems please get in touch via the editor.

[1] The equation for the energy *density* (energy/unit volume) stored in an electric field is $u = \frac{1}{2} k \epsilon_0 E^2$ where E is the electric field strength, k is the dielectric constant and ϵ_0 is the permittivity of free space. This means that if you measure the field at a point, then the energy density in an infinitesimally tiny volume around the point is as given by the equation. For a PPC the *total* energy stored works out as $U = \frac{1}{2} CV^2$ (note difference between U and u).

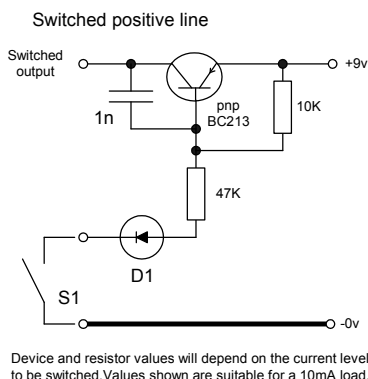
Technical Snippets

a) Frequency Counter LF Adaptor - To make an accurate measurement of a low frequency signal on a conventional frequency counter requires very long gate times. For example, to measure 10Hz to the nearest 0.1Hz requires a gate time of 10 seconds and the result would be subject to a gating error of +/- 0.1Hz plus any timebase errors.

An alternative solution is to multiply the low frequency signal by 1000 and then measure the resulting frequency with a shorter gate time. This can be achieved by phase locking a voltage controlled oscillator (VCO) to 1000 times the input signal, measuring the VCO frequency and moving the decimal point by three places to the left to show the correct frequency.

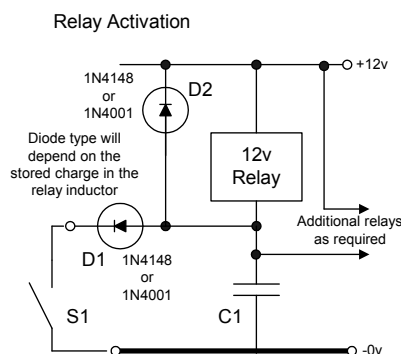
b) Control Circuits - When it comes to hard wiring controls to their respective circuits I have always preferred active low or pull down circuits using isolating diodes if required. This ensures that under normal operation the switched circuit is current limited and the diode allows dissimilar voltage circuits to be controlled by a single switch. That switch may be a mechanical or semiconductor type depending on the currents and voltages involved. A typical application would be controlling relay selected low pass or band pass filters or the various operational mode circuits in an HF receiver of transceiver which would include oscillators and active filters.

The first circuit shows a simple method of controlling a low current +9v supply line to an oscillator or similar. Close the

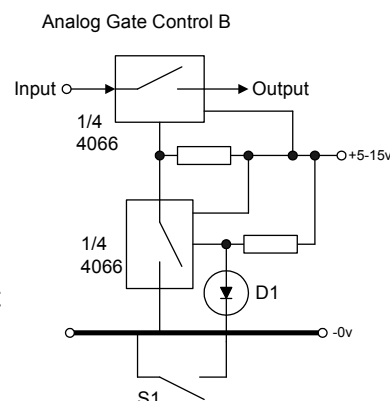


switch to turn the supply on, open the switch to turn it off. Switch current = 176uA.

This circuit will control one or more low power relays. If the same supply is used for all relays then the series diode to the switch is not required. Additional circuits will require the diode in each control line. For low power relays the 1N4148 diode is sufficient.

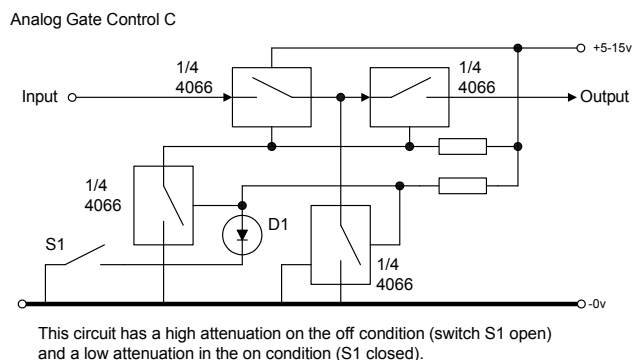


The next circuit shows how to turn on and off a CMOS analog gate using another gate as a DC inverter. Analog gates may be used as low distortion signal switches but do consult the data sheet for the maximum signal levels for the supply voltage in use.



The prime disadvantage of using a single gate is the fairly low isolation in the off state at high frequencies. The 4066 data sheet states -50dB at 1.25MHz although this will be improved at lower frequencies.

The low isolation issue in the 4066 may be improved a bit by using two switches in series and one shunt switch as shown in the following circuit.

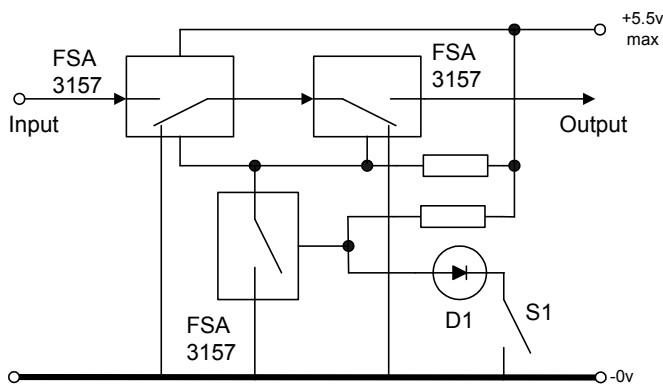


When the two switches at the top are on, the shunt switch in the lower centre is off and signals pass through with minimal attenuation. When the two switches at the top are off, the lower centre switch is on forcing any remaining signal leakage to ground and significantly increasing the attenuation. The lower left switch is used as a DC inverter. The CMOS 4066 contains four switches as shown.

The maximum isolation is determined by the crosstalk between the multiple switches on the IC substrate about which there is little that can be done in the 4066. However, this may be significantly improved by using packages that contain a single analog switch like the FSA3157 (single pole double throw costing

29p + VAT each for 5+) so no crosstalk issues, just the stray coupling across the switch in the off state.

Analog Gate Control D



This circuit has a high attenuation on the off condition (switch S1 open) and a low attenuation in the on condition (S1 closed).

An extra advantage of this change-over device is that the shunt signal switch is no longer required as the connection made in the off state in each series change-over switch may be grounded as shown above. The resistors may be relatively high values and RF decoupling is not shown. Diode D1 is a 1N4148 and the lower gate is used as a DC inverter. Note the much lower maximum supply voltage.

Members News

Club member Graham M0GTC in Cambridge has reported hearing my signals at about S3 during a recent Wednesday evening 2m net. Graham plans to improve his colinear aerial installation which is currently much too close to a vertical support mast for a TV aerial, distorting the radiation pattern.

Miscellaneous

a) New Club Web Site: Committee member Nick has taken on the task of building a new club web site which has a URL based on the club initials which is:

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

This has given us a chance to simplify the site and reduce the amount of information which has built up over the years. A new club specific email address has also been created which is:

crystalpalaceradio.club@gmail.com

Which auto forwards to my own email address.

b) Club Database: This has now been amended to hold details of club property and its current location for auditing purposes. Copies are held by our Secretary Alan and myself.

c) High Power Transmitting Components: If you need some of these, they can be purchased online at very reasonable prices from <http://www.ur4ll.net/> using your credit card to a payment facility similar to Paypal. I recently purchased some high power 5 pole 11 way ceramic wafer rotary switches at \$6 each which arrived in 4-5 days.

d) IC Stripboard: If you need to use SMT ICs in a prototype design this stripboard adaptor makes the job a

lot easier. Four types that match the most common lead pitches are available. For more information see:

<https://icstripboard.co.uk/product%20review.html>

e) Museum of Brands - Cathy and I visited this museum which is close to Ladbroke Road tube station. All of the items are laid out in a long winding timeline from the 1800s featuring mainly household items and toys.

Of particular interest to me was the collection of old radios dating from the 1920s to a few years back and some televisions and gramophones. It was also interesting to see how brands that exist today commenced their advertising and packaging many years in the past including Kitkat, Chocolate Power, Cadburys Milk Chocolate, Brasso and Vim amongst many others.

For more information see:

<http://www.museumofbrands.com/>

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) 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 £250
- Alinco 6m DR-M06 20W FM transceiver £75
- 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
- Boxes of components i.e. variable capacitors, low voltage transformer, valves, etc. £10

Offers to Alan G8NKM on 020 8778 9660 or email [alan.odonovan\(at\)btinternet.com](mailto:alan.odonovan(at)btinternet.com).

b) From the shack of Trevor M0DIA

- Tronix 13.5v 5A fan cooled power supply £20
- AKD 2001 144MHz 3/25W channelised FM transceiver, (requires a 13.5v DC supply) £50 (under offer)

View at a club meeting. Offers to Bob G300U on 01737 552170 or email [g300u\(at\)yahoo.com](mailto:g300u(at)yahoo.com)

c) From the shack of Bob G300U:

- Commercially designed and made 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/g300u/pto.html>
- 1.4MHz crystal filters for USB & LSB, all tested, £15 each
- Pye 455KHz LC filter, 15KHz wide, £3

Offers to Bob G300U on 01737 552170 or email [g300u\(at\)aol.com](mailto:g300u(at)aol.com)

From the shack of Kim G6JXA:

- Icom IC-F41GT UHF ex-Commercial Handheld with keypad, (suitable for 70 cms FM) known to be CTCSS / DTCS / DTMF capable, 4 watts. Includes BC-144N Charger, BP-210N battery, rubber duck antenna. £25
- Yaesu VX-10 2m VHF handheld. Includes rubber duck antenna and charger unit. South London repeater frequencies programmed in. £25
- Microwave Modules 432Mhz Linear PA and receive preamp, untested, BNC input, N output, leads very short, no fuse, marks on case. £25
- TECH TRADIPER TE-15 vintage 1970's Grid Dip Meter with [2] coils, untested. £10
- PSU BT ex-commercial 15VA output, has "Telecom Steel Charger 1", "british telecom" on front. Moulded UK mains plug on cable. No fuse or fuse cover on plug. Untested. Has handle. £5
- PSU Watson W10SM 13.8V DC. Switched mode, gives 13.8V out tested with DVM only, not under load. £15

All items bought as seen by pre arranged appointment only. Payment in full only by cash. Contact: [g6jxabrs34540\(at\)gmail.com](mailto:g6jxabrs34540(at)gmail.com), 24hr Answerphone or text to 07812735507, packet: g6jxa at gb7cip.

Wanted

850-0-850v output 600VA toroid or conventional mains transformer.

Offers to Bob G300U on 01737 552170 or email [g300u\(at\)aol.com](mailto:g300u(at)aol.com)

CPREC has a large bank of fundamental and overtone quartz crystals, from 1.0 – 99.91MHz. The list has now been completely updated with enclosure classifications, sorted in frequency order and placed on the club web site Notice Board. Prices are £1 each to club members and £2 each to non members, both plus P&P.

73



G300U

Diary of External Events

11 Feb 2018 - Harwell Radio and Electronics Rally

Didcot Leisure Centre, Mereland Road, Didcot, Oxon OX11 8AY (3 miles from Milton Interchange on A34). Open 10am to 3pm – entrance £3 (under 12s Free). Free car parking with disabled parking and facilities. Traders, Special Interest Groups and an RSGB book stand. Refreshments available all day. Talk in on 145.550MHz (G3PIA). Details Ann (G8NVI) ann.stevens@btinternet.com or www.g3pia.net/radio-electronics-rally

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 G300U. 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 endeavour to do so if advised in time. We do not have time to go chasing each club for the information.

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/>

14 Dec BRATS Christmas Party
18 Jan 18 Bring & Talk

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 G4WGWZ on 01689 878089 or [enquiries\(at\)bdars.co.uk](mailto:enquiries(at)bdars.co.uk). Web: www.bdars.co.uk

21 Nov Regenerative Receivers
19 Dec Quiz & Mince Pies
16 Jan 18 AGM and Programme Planning

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

05 Dec "Xmas Social"

Couldson 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/>

11 Dec Annual General Meeting

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](mailto:secretary(at)carc.org.uk) or Web: <http://www.carc.org.uk/>

08 Dec Annual Fish & chips Dinner
24 Jan 18 Club AGM

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

01 Dec Christmas Dinner
07 Dec Amateur Radio in the Movies

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>

28 Nov AGM & RSGB film
07 Dec Christmas Dinner

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>

14 Dec Christmas Party
 28 Dec No meeting

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/>
 27 Dec No meeting

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/>
 01 Dec Mince Pies and Christmas fancy dress

Horsham Amateur Radio Club

meets on the first Thursday of each month at the Guide Hall, 20 Denne Road, Horsham, West Sussex, RH12 1JF. NRQ TQ172304 at 20.00hrs local time. Contact Alister Watt G3ZBU at [g3zbu\(at\)hotmail.com](mailto:g3zbu(at)hotmail.com) or <http://www.harc.org.uk/>
 26 Nov Sunday Morning Fox Hunt
 07 Dec Club AGM

Mid-Sussex Amateur Radio Society (MSARS)

Meet most Fridays in the Millfield Suite, Cyprus Hall, Burgess Hill, RH15 8DX from 7.30pm till 10.00. Contact Stella on 01273 844511, [M6ZRJ\(at\)msars.org.uk](mailto:M6ZRJ(at)msars.org.uk) or www.msars.org.uk
 01 Dec Christmas Dinner - In House UPSTAIRS

South East Essex Amateur Radio Society (SEARS)

Contact Mark Callow 2E0RMT on 07842 336444 or [secretary\(at\)southessex-ars.co.uk](mailto:secretary(at)southessex-ars.co.uk) or <http://www.southessex-ars.co.uk/>
 Meetings: 7pm 2nd Tuesday each month at The White House, Kiln Road, Benfleet, Essex, SS7 1BU.
 12 Dec Christmas Social
 09 Jan 18 Rally preparations

Surrey Radio Contact Club (SRCC)

7.30 for 7.45pm on 1st. and 3rd. Mondays every Month. Contact John Kennedy G3MCX on 020 8688 3322 or [secretary\(at\)g3src.org.uk](mailto:secretary(at)g3src.org.uk). Web: <http://g3src.org.uk/>
 04 Dec Radio Astronomy with George Emsden
 08 Jan 18 SRCC Construction Contest

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](mailto:info(at)scrs.org.uk)
 Web: <http://scrs.org.uk/>. SCRS run a practical group most Monday evenings at the Bandstead Scout Hut.
 14 Dec Christmas Junk Sale
 18 Jan 18 An introduction to morse code – Dan Romanchik KB6NU.
 15 Feb 18 Accessing weather satellites – Paul Kenny 2E0PCK.

Wimbledon & District Amateur Radio Society

Meets on the 2nd and last Friday in the month at Matin Way Methodist Church Hall, Martin Way Merton Park, London, SW19 9JZ at 19:30hrs for 20:00hrs. Contact: Andrew G4ADM on 020 8335 3434 or [andrew.maish\(at\)ntlworld.com](mailto:andrew.maish(at)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	3 & 10 Feb 2018	Eltham, SE9	Cray Valley RS	2 days (Sat)	www.cvrs.org
Intermediate	28 Feb, 11, 18 Mar 2018	Bromley	Bromley & District ARS	3 days (Sunday)	www.bdars.org
Foundation	Sep 2018 dates TBC	Bromley	Bromley & District ARS	2 days (Sun)	www.bdars.org
Intermediate	Nov 2018 dates TBC	Eltham, SE9	Cray Valley RS	3 days (Sat)	www.cvrs.org
	= course commenced				

CPREC Committee Contact Information

Officers:		
Chairman: Damien Nolan 2E0EUI 7 Fonthill Court Honor Oak Road London SE23 3SJ 07900 242541 Gorby928(at)gmail.com	Secretary: Alan O'Donovan G8NKM 2 Mackenzie Road Beckenham Kent BR3 4RU 020 8778 9660 Alan.odonovan(at)btinternet.com	Treasurer: Ian Skeggs M6FZC Ground Floor Flat, 24 Kendall Road Beckenham Kent BR3 4PZ 020 8650 9049 ian.skeggs(at)btinternet.com
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