



SURREY RADIO CONTACT CLUB

84th Anniversary Year - Founded 1935

APRIL 2019 – No 920

SRCC supports the RSGB Child Protection Policy

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MONTHLY MEETINGS NORMALLY ON 1ST AND 3RD MONDAYS 7.30 FOR 7.45pm

Meetings at Trinity School, Shirley Park, Croydon CR9 7AT

FIRST MEETING Monday 1 April
Annual General Meeting

SECOND MEETING Monday 15 April
Fix-it, Skills and Advice Night

Retiring SRCC Committee 2018/19

Chairman & Club Meetings	G3ZPB Peter Burton	01737 551413
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EDITOR'S OPENER

Dear Members & Friends. Hello and welcome to the 920th edition, the April 2019 issue, of the SRCC Newsletter. This, of course, is the final Newsletter for the year 2018-2019.

There is a saying: "If you are too busy to make a QSO, then at least you can listen". My intermittent radio activities have done just that. The top end of 80m, around 3780, delivered several east coast USA stations at surprisingly good strength. It was necessary to be awake around midnight, but quite rewarding, given my relatively poor antenna – Inverted L, 10m vertical and 30m horizontal, remote automatic ATU, tuned against ground which is just a 1m long earth spike. In operation involving real QSOs, I was part of an impromptu 3710 kHz net, mid-afternoon weekday, with John G8MNY, Kim G6JXA and Steve G4FYF. I expect John and

Kim always to be at good strength, but Steve on the south east coast was also a very respectable copy with me. As reported before, John G8MNY is usually active on weekday afternoons on 3710 kHz and I often join him for a rag-chew. His antenna is much better than mine and he runs 400 watts, so he usually works stations which are no-copy with me.

Meanwhile, I have focused on the Es-Hail 2 Qatar Oscar 100 satellite (2.4 GHz uplink, 10.5 GHz downlink) which is in geostationary orbit at 32.5 degrees E of S and offers 24/7 coverage of a third of the world (Europe, Africa, part Asia, part South America). Just as a taster, I linked my laptop with www.eshail.batc.co.uk. This provides nice spectrum displays of the 10.5 GHz downlink (narrow band sector: Data, CW and SSB, and wideband sector: Digital TV). The receiving set-up is a 1.3m dia offset dish with LNB and GPS-locked SDR located at Goonhilly Earth Station. Full quieting at the Goonhilly RX is achieved with signals about 2 S-points above noise (S7), as displayed by the dynamic bar-graph and most stations can generate sufficient power at 2.4 GHz to do just that. However, the lack of a noise cancelling facility on the SDR, to cover the pauses in speech, other than audio squelch, makes copy a bit tedious over a lengthy session. Countries heard by me, so far, are Brazil, Estonia, UK, Germany (majority of stations), Bosnia-Herzegovina, Czechia, Finland, Italy, Malta, Norway, Netherlands (quite a lot), South Africa. There are usually several stations active within the narrowband sector passband at any time (4 SSB, 2 CW, 1 beacon as I write).

As part of a home-station set-up:

1. for 10.5 GHz downlink reception, I am tempted to utilise my redundant 1m diameter parabolic dish on a horizon-to-horizon motorised polar mount by substituting a modified LNB (to shift local oscillator frequency from that normally used for sat broadcast tv stations and thus the IF) at the dish focus, plus my 70cm transverter as 1st IF, connected to the separate receive antenna input terminal of my hf transceiver. This is an effective and least cost solution.
2. for 2.4 GHz uplink transmission, a few watts from a new 13cm transverter and linear amplifier will be required, probably using my 2m transverter as 1st IF, connected to the 1mW drive output terminal of my hf transceiver. A gainy, circularly polarised, antenna would be needed too (maybe more than one) – and somewhere discreet to mount it or them! All that could/would involve significantly greater expenditure – whether employing kits, homebrew, or ready made.

Maybe this will all end up as a: "well it would have been nice - in retrospect" project, but it is tantalisingly different from run of the mill. There is also the small matter of the dozen or so other projects still awaiting completion here! Nevertheless, it would be good to hear from anyone who has engaged in a similar activity or plans to do so. That may encourage me further.

NEXT MEETINGS

First Meeting: Monday 01 April 2019: Annual General Meeting

Formal notice to members, Nominations Forms for the 2019-20 Committee, an Agenda and Minutes of the 2017-18 AGM have all been distributed to members over the last couple of months. The principal purpose of the meeting is for the retiring Committee to account for its activities – presented in the form of a Report from the current Chairman and a Financial Report from the current Treasurer. Additionally, a new Honorary Secretary and Committee will be elected and, subsequently, a Chairman, Treasurer and Vice-Chairman. The Treasurer's Report, which is confidential to SRCC members, will be presented in paper form and cover income, expenditure, assets and forecasts for the coming year – not to mention a recommendation for the subscription level. It is also an opportunity for members to raise questions and make comments and suggestions for Club activities or organisation. This is an important event. Please make every effort to attend.

Second Meeting: Monday 15 April: Fix-it, Skills and Advice Night

PREVIOUS MEETINGS

First February Meeting : Monday 4 February “CHRIS’ MILLIMETRIC MICROWAVE ADVENTURES” by G0FDZ. Summary (Part II) by Quin G4WRR.

This is the second part of the write-up of the talk to SRCC dated 4th February 2019 on millimetric microwaves given by Chris Whitmarsh G0FDZ assisted by Dave Lee G8ZZK. The first part of the write-up in the March Newsletter gave a general description of the millimetric bands, outlined some of the techniques and technology involved, and provided a more detailed exposition of operation on the 24GHz band. This part describes the higher bands and answers some of the questions raised at the end of the presentation.

Chris spoke about the beacons available on the millimetric frequencies: there are several operating on 24GHz and one on 47GHz. In addition there are proposals for beacons on 76GHz and 134GHz. It is also possible to make “do it yourself” beacons based on simple multiplier chains, and these are useful for testing equipment and antennas. He noted that test equipment is also often provided at Microwave Round Tables for this purpose. He described some of the general techniques used above 24GHz. The basic options are fundamental mixers, sub-harmonic mixers and multipliers from lower frequencies. The former two are well suited for receive, but separate multipliers for transmit have the advantage that they allow higher power to be obtained – useful as it allows greater distances to be obtained. In terms of modes, CW offers a range advantage over SSB (not wholly a VHF characteristic...) and in addition may allow equipment to be constructed more easily. FM can also be useful when signals are strong. Chris went on to talk about each band in turn....

47GHz (6mm) Commercial equipment for 50GHz can be used or modified. An entry level mixer board useable on CW & SSB is available from Kuhne Electronics (DB6NT) but:

- the transmit power is low (typically less than 500µW)
- image rejection is poor due to unavailability of suitable filters
- construction is fiddly, requiring time and care as many components are small and easily damaged – particularly the anti-parallel beam lead diodes which cost around £50 and are so small they can be easily lost and cannot be soldered (the preferred solution being the use of silver based epoxy glue!)
- a certain amount of metalwork is required – particularly accurate drilling.

Local oscillator (LO) designs for up to 11GHz and 23.5GHz are available (the latter from DB6NT) but commercial synthesisers for lower frequencies (eg. 11.75GHz) can be used with multipliers.

As for antennas, historically dishes from Procom have been used (although these have non-standard waveguide flanges) but are no longer made. Ex-commercial dishes, typically up to 0.5m diameter, have also been used, but must be chosen carefully. Some ex-commercial 50GHz dielectric horns have also been tried but these are less effective at 47GHz than 76GHz! Several pictures of 47GHz gear were displayed, including one of the DB6NT mixer board. Chris noted that coupling to the waveguide was via a hole in the PCB – and the diameter of the hole

was critical (to an accuracy of 0.1mm on the higher bands) as this affected the cutoff frequency and hence ability to provide high pass filtering.

76GHz (4mm) Equipment typically uses a DB6NT mixer board but transmit power is low at 250µW maximum. LO injection is often from the second harmonic of a 38GHz oscillator. Another option is x4 multiplication giving 38GHz from a 9GHz oscillator – and a suitable board is available from DB6NT at reasonable cost. Surplus commercial units have also been used (eg. by G8CUB) but these can necessitate use of awkward intermediate frequencies. Image rejection filters are available but are expensive. Dielectric horns designed for 50GHz can give good results (as good as Procom dishes. Particular problems at 76GHz and above are LO stability and jitter, and increasing oxygen and water vapour losses. Pictures of a beam lead diode (the size of a small full stop), a DB6NT mixer board, a mini-beacon and several typical 76GHz setups were shown.

122GHz (2.5mm) This band is little used in the UK although there is more interest within Europe, with some components and boards available from DB6NT. However little surplus equipment is available due to these frequencies being little used commercially, and oxygen absorption limits maximum ranges. Designs are similar to those for 134GHz, often using slab type mixers. A critical factor here is getting the hole coupling the board to the waveguide exactly the right diameter (1.7mm in the case of 122GHz) otherwise the cutoff frequency of the waveguide (and hence its high pass filtering ability) will be prejudiced. LO radiation is unavoidable so care must be taken to ensure this is within the band.

134GHz (2mm) Ex-commercial equipment is very rare on this band. However DB6NT can again supply mixer boards (requiring a board to waveguide coupling hole on this band of 1.6mm diameter!). A single mixer diode rather than an anti-parallel pair is used so power is very limited - 200µW maximum. Indeed 1mW is regarded as QRO at these frequencies. For this reason on transmit it is generally better to multiply up from a lower frequency rather than rely on the mixer. For this reason any further bands above 134GHz are likely to be harmonically related to it. LO noise and jitter from crystal controlled sources is so bad when multiplied up that 11GHz phase locked loops (PLLs) are preferable. Procom 142GHz dishes (no longer available) are useful but have a beamwidth of around 0.8°, so compasses are no longer adequate for beam alignment and rifle type sighting scopes are generally used. There is still a great deal to be learnt, in terms of technology and propagation, on this and higher bands.

241GHz (1.2mm) A sub-harmonic mixer is available from DB6NT but as it uses the 10th harmonic of a 24GHz LO it is very inefficient. Using the 7th harmonic of a 34GHz LO is better, but LO noise and jitter make either marginal, so multiplying up from a 11.45GHz PLL is much preferable. Transmit output is very low – less than 10µW – so CW is the mode of choice. The preferred waveguide – WG30 - is very hard to get in the UK but waveguide used on 122/134GHz does work, although not that well. Circular waveguide with a hole diameter of 0.8 – 1mm can also be used. Antennas are usually very small dishes or horns. Activity in Germany and the USA preceded that in the UK, but the first UK contact took place (on CW, over a distance of 30m) in February 2016 between G0FDZ/P and G8CUB/P.

Above 241GHz Germany has an allocation at 411GHz and the USA allocations at 322 & 403GHz. At these frequencies, which are above the strict definition of the radio spectrum, totally different techniques based on quasi-optical methods are required. In the UK a number of frequency allocations between 275 and 1000GHz are now available by NoV to full licence holders – G8CUB has equipment for 288GHz and pictures of this were shown. Chris noted that SDR techniques can be useful in helping to identify very weak signals, and has implemented a system in which a wideband IF output at 68.33MHz is taken from the FT817 tuneable IF and is decoded via a TV dongle on a PC using readily available HDSDR software.

In response to questions, Chris provided the following information:

- the 24 & 76GHz bands are at risk from commercial interests
- horizontal polarisation is used – this is just a convention rather than a consequence of technical / propagation constraints. Chris was unaware whether paths experienced polarisation shift
- in principle, health risks do arise when running over 2W on 24GHz – but provided sensible precautions are used, in practice risks are very low
- travelling wave tubes (TWTs) can be used – and Chris has one - but they are getting temperamental by the time 24GHz is reached
- ignition noise is not a problem
- tripods for mounting equipment need to be of good quality (eg. photographic) to avoid too much wobble
- it would be better to work upwards in frequency from 23cm rather than going straight to 24GHz.

Chris concluded by saying “I look forward to working you all on the millimetric bands”.

First March Meeting: Monday 4 March: Spring Surplus Equipment Sale.

There is not a lot to say. Gareth G4XAT performed immaculately and entertainingly as Auctioneer – expertly assisted by Maurice G4DDY who ensured that goods passed safely to the correct purchaser. Attendees appeared content with their purchases and sheer theatre of the event. The club received a respectable income arising from sales commission or donation.

Second March Meeting: Monday 18 February: Fix-it, Skills and Advice Night

As often stated: No written report, but one of the popular cornerstones of what SRCC offers and expertly led by John G8MNY.

CHAIRMAN'S BLOG

Well.....here we are at the end of another year in the long history of SRCC and this is the last “Chairman’s Blog” before the AGM when we all get the chance to elect a new committee.

Radio Contesting – this last month has seen some resurgence in my contest operating with results being published. The first result was the 70cms UKAC – 41 of 111 entrants, so well into the top half and zero logging errors! This is also a club-orientated contest and we were 25th of 29 in our section. As I mentioned last month, the 2m MGM (data mode) contest was a different story... 18th of 20 entrants, but at least that is not bottom, and plenty of scope for improvement!!! I can at least claim zero logging errors. Pressure from other things has prevented any contest operation this month so we’ll have to look further ahead for future contesting.

Computer software – yes, as hinted last month, the full version of “Minos2” VHF Contest Logging program has now been released. After extensive testing, in addition to the normal logging and scoring of contest QSOs, it also includes control of the attached Radio and Rotator plus direct interface to a website Cluster and also WSJT-X software for Data Contests. And, it all appears to work! There is a full demonstration to the club planned during my talk in May.

Antenna Rotators – I have been investigating a new Rotator system for club activities using a computer control system (Minos2) for the “standard” CDE Controller plus CD44/Ham-II/Ham-III Rotors. In order to allow 2 different Controllers to be connected to 2 different Rotors with variable length cables, I decided to use some small “waterproof” connectors with gold-plated pins for reliability. This meant a total of 4 x cable plugs, 3 x cable sockets (one of the rotors was already fitted) plus the various contacts and cable clamps. Total bill? Over £140!!!! The plugs and sockets are cheap enough until you realise they don’t include the contacts. My only consolation is that using anything other than gold-plated (even if they were available) would probably have been a false economy – it would only need to use the system for one wet NFD and I could imagine all sorts of complications the next time it was used?

Computer rebuild – the Dell laptop computer I use for Amateur Radio has been giving problems for several months – supposedly a few faulty sectors on the HD stopped MS Windows 10 from updating since last September. Rather than replace the HD on a like-for-like basis, I decided to upgrade to a new SSD. Having spent most of a weekend installing all the software and let Windows install its many updates, the result have made it all worthwhile. The computer loads and is ready-to-run in less than half the time it took previously and is generally more “responsive” to commands now. And supposedly takes less power, resulting in longer battery life and cooler running.

That’s all for this month, so it’s bye for now; I hope to see lots of you at the AGM on 1st April.
[73 and 88, Peter G3ZPB.](#)

SRCC LEAGUE TABLE – FEBRUARY 2019 RESULTS

Welcome to the results of the February 2019 session of the SRCC League Table. This month there were six entries, two down on last month, as shown below:

ENTRANT	HEARD DXCC / SQUARE	HEARD IN CONTEST	HEARD - SRCC MEMBER	WORKED DXCC / SQUARE	WORKED IN CONTEST	WORKED – SRCC MEMBER	POINTS THIS MONTH
G4WGE				52	40		144
G4LZE	34			50		1	134
G3EUE	11			46	3		106
G3ZPB				12	10	6	46
G4FYF	1			13		2	31
G3WRR				9	9		27

The scores were rather more evenly spread than those for January, but this month’s leader was again Alun G4WGE with 144 points followed by Colin G4LZE with 134 points moving up to second place from third in January. Ted G3EUE was in third place with 106 points. There was then a substantial gap before Peter G3ZPB, Steve G4FYF and yours truly again bringing up the rear!

Alun’s contacts were mainly on RTTY with a sprinkling of FT8 and CW. The majority were fairly evenly distributed between 80, 40 & 20m with a handful on 160, 30 and 17m but nothing on 15m or above. The majority were European but a few in Africa, Asia and North America were made.

All Colin’s contacts were made using data modes, the great majority being FT8 – mostly on 40m with a few on 20m and one local contact on 10m using JS8, the conversational variant of FT8. Again most of the contacts were European with a small number of Asian and Africans and a single North American. Colin also listed quite a large number of stations in the “heard but not worked” category and these contained a higher proportion of interesting prefixes, including 9M2

(West Malaysia), XX9 (Macao), HI8 (Dominican Republic) and FG8 (Guadeloupe) in all continents except Antarctica.

Ted's entry follows a similar pattern, containing largely European contacts with a few Asians and North Americans – plus a number of interesting “heard and not worked” stations. His contacts were, as far as I am aware, all on CW and included some activity on 15m but none above that. The other three entries included a mix of HF & VHF contacts, the HF ones being in the main on 80m and 40m.

The cumulative score table is shown below, with the four leading four stations taking the same positions as they did in the monthly results for February.

ENTRANT	JAN 19	FEB 19	MAR 19	APR 19	MAY 19	JUN 19	JUL 19	SEP 19	OCT 19	NOV 19	DEC 19	TOTAL
G4WGE	115	144										259
G4LZE	109	134										243
G3EUE	111	106										217
G3ZPB	32	46										78
G4FYF	34	31										65
G7RUX	42											42
M0LEP	34											34
G3WRR	1	27										28

There are slight indications from these results that conditions may be improving and that we are perhaps “turning the corner”, into the start of cycle 25. The solar flux index (SFI) has recently started climbing above its recent “bumping along the bottom” level of around 70 into the bottom of the eighties. But that is getting ahead of ourselves! Watch this space next month to see how things progress.....[73, Quin G3WRR](#)

SRCC NETS

The following is a list of structured nets where members of SRCC meet regularly. They are sometimes joined by members of other local clubs, who are always made most welcome. The net is not usually led by a nominated controller, but stations normally transmit cyclically, in the chronological order in which they sign-in. If any member wishes further occasions and frequencies to be added to the table, please let me know at secretary@g3src.org.uk.

Band – Frequency - Mode	Day of week	Start Time
160m – 1.905 kHz - LSB	Sunday	9.30 am
10m – 28.078 MHz – JS8	Thursday	10.00 am Date & Time Tentative
4m – 70.30 MHz - FM	Thursday	8.00 pm
6m – 51.51 MHz - FM	Tuesday	8.00 pm
2m – 144.6125 MHz – D star	Friday	7.30 pm
2m – 145.35 MHz – FM	Friday	8.00 pm

VALE G3RJV

You may have heard the sad news that (Revd) George G3RJV, founder of G-QRP, passed away in the early hours of 10th March . It was known that he had been in poor health recently but this still comes as a shock. He was known, it seemed personally, by so many in the hobby and obviously had DXing in his heart. *Thanks to Mike M1CCF for this information. Ed.*

WEST LONDON RADIO & ELECTRONICS SHOW Sunday 14 April 2019
Kempton Park Racecourse, Staines Road East, Sunbury on Thames, TW16 5AQ.

Doors open 10pm, Lots of free Car Parking. Traders in Equipment, Antennas and Components, Lecture Streams, Refreshments, Bring and Buy by CATS, Local and National Societies' Displays and Surplus Equipment Sales An SRCC team will be in attendance.

FUTURE SRCC MEETINGS - subject to endorsement by 2019-20 Committee

01/04/19	Annual General Meeting
15/04/19	Fix-it, Move-it-on, Skills and Advice Night, Social Chat
13/05/19 NOTE	Radio Contesting by Peter G3ZPB: How to enter. How to set up a logging programme, using a computer. How to log contacts. Practical demo.
20/05/19	Fix-it, Move-it-on, Skills and Advice Night, Social Chat
03/06/19	Construction Evening: Tentatively - HF Noise Reduction Project
17/06/19	Fix-it, Move-it-on, Skills and Advice Night, Social Chat
01/07/19	Setting up N1MM and HF Contest Adjudication Process by Quin G3WRR
15/07/19	Fix-it, Move-it-on, Skills and Advice Night, Social Chat
05/08/19	Summer Barbecue: Tentatively – at QTH G3ZPB in Coulsdon
19/08/19	Fix-it, Move-it-on, Skills and Advice Night, Social Chat
02/09/19	TBA
16/09/19	Fix-it, Move-it-on, Skills and Advice Night, Social Chat
07/10/19	Autumn Surplus Equipment Sale
21/10/19	Fix-it, Move-it-on, Skills and Advice Night, Social Chat
November onwards	First Meetings TBA, but every 3 rd Mondays will likely be the Second Meetings: Fix-it, Move-it-on, Skills and Advice Night, Social Chat

OTHER LOCAL CLUB MEETINGS

16 Apr	<p>Bromley & District ARS</p> <p>Exam Syllabus: What Next?</p> <p>Normal Meetings are held on third Tuesdays 7.30 for 8.00pm @ Victory Social Club, Kechill Gardens, Hayes, Bromley, Kent.</p> <p>Contact Andy G4WGZ on 01689 878089 or enquiries(at)bdars.co.uk.</p> <p>Website: www.bdars.co.uk</p>
8 Apr	<p>Coulsdon ATS</p> <p>The Anderson Powerpole</p> <p>Meetings are held at 8pm on 2nd Monday each month at St. Swithun's Church Hall, Grovelands Rd, Purley.</p> <p>Contact Andy Briers G0KZT on 07729 866600 or secretary@catsradio.org</p> <p>Website: http://www.catsradio.org/</p>
18 Apr	<p>Sutton & Cheam RS</p> <p>999 Emergency! Public Safety Communications Past, Present and Future by Steve G3ZPS</p> <p>Meets 8pm on 3rd Thursday every month. They also run a practical group most Monday evenings at the Banstead Scout Hut.</p> <p>Contact Chris Howard. email info(at)scrs.org.uk</p> <p>Website: http://www.scrs.org.uk/</p>
4 April	<p>Horsham Amateur Radio Club</p> <p>50 years of Computer Programming with M0TWM</p> <p>Normally 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</p> <p>Website: http://www.harc.org.uk/</p>
23 Apr	<p>Dorking & District Radio Society</p> <p>Element Interactions in Antennas with Garth Swanson</p> <p>Meetings at 7.45pm. Contact: David Browning (M6DJB) at djb.abraxas(at)btinternet.com.</p> <p>Website: http://www.ddrs.org.uk</p>

5 Apr	<p>Crystal Palace R&EC</p> <p>Construction Evening – The Pixie QRP Transceiver</p> <p>All Saints Church, Beulah Hill (Normally meets monthly on first Friday). Contact: Bob G3OOU 01737 552170</p> <p>Website: http://www.g3oou.co.uk</p>
4 Apr	<p>Cray Valley Radio Society</p> <p>Small Transmitting Loops with Mike G3LHZ</p> <p>1st Royal Eltham Scouts HQ, Rear of 61-71 Southend Crescent, Eltham, London SE9 2SD</p> <p>Website: www.cvrs.org</p>

Sign Off.

Well that is it for another Club year. Thanks to all the contributors. I hope that the Newsletter continues to be informative and entertaining. It would be good to have more input – particularly data/pictures on what you have worked with what equipment and more so what you have built yourself. 73 from John G8IYS Hon Sec and Newsletter Editor.