



SURREY RADIO CONTACT CLUB

86th Anniversary Year - Founded 1935

AUGUST 2021 – No 948

SRCC supports the RSGB Child Protection Policy

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With the (nominal) end of lockdown on 19th July, we hope to be able to resume face-to-face meetings at Trinity School shortly. However as we all know, things in the COVID world can change – so for the most up to date information, please keep an eye on the SRCC website at <https://www.srcc.uk> . The position at the time of writing is given in the Future Meetings section below.

SRCC COMMITTEE 2021/22

Chairman	Vacant	
Acting Chairman for August 2021	G3ZPB Peter Burton	01737 551413
Vice Chairman & BE Coordinator	G3ZPB Peter Burton	01737 551413
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Publicity	G3MCX John Kennedy	020 8688 3322
Committee Member	G7VAK Paul Beaumont	07818 660493
Webmaster (Co-opted)	G4FYF Steve Jones	01424 584143

EDITOR'S OPENER

Dear Members & Friends,

Welcome to the August 2021 SRCC Newsletter.

Well, at the time of writing we have passed 19th July - "Freedom Day" - when the lockdown restrictions have finally been lifted – but not completely, as it now appears! Psychologically this is a big step forward but we will have to see how things play out – in particular the trend in number of new cases and more importantly the number of hospitalisations. It may be that we as amateurs have been affected less than other groups within society as we can conduct our hobby effectively from indoors. Seeing the television news displaying groups of youngsters going into raptures as the seconds ticked down to zero rather surprised me – so I guess it's partly an age related thing: I didn't see any SRCC members in night clubs etc. in the footage, which seems to bear that view out...

The position regarding our keenly awaited return to face to face meetings at Trinity School is still not clear – the position at the time of writing is shown in the Future Meetings section – but for the most up to date news it would be a good idea to visit the SRCC website at:
<https://www.srcc.uk/meetings/meetings-calendar/> .

So here we go....

73, Quin G3WRR
SRCC Secretary / Newsletter Editor

PREVIOUS MEETINGS

In view of the unavailability of Trinity School for the proposed Construction Contest, the July A meeting on the 5th was instead a Video Evening via Zoom. The video presented was number 25 from the TX Factor series, and consisted of a number of relatively short items, covering the following topics:

- WQRadar
- RFinder
- Elecraft K4
- Wolfwave
- RF repeater linking.

More than one viewer commented that this format worked better than a longer single topic video.

The virtual B meeting on 19th July was the familiar Zoom based Round Robin and was attended by ten members and covered a wide range of topics related to what the attendees had been doing in the previous month.

FUTURE MEETINGS

As explained in last month's Newsletter the August A meeting will **NOT take place on the traditional first Monday evening of the month** but will instead be on the afternoon of Sunday the first at the home of Peter G3ZPB and Wendy in Old Coulsdon from 1pm (clock time – none of this GMT / UTC business). There has been a healthy response from members who have completed the form attached to July Newsletter and returned it to Peter G3ZPB – but for those who have not yet done so and wish to attend another copy is attached at the end of this issue. It is important that you let Peter know by midnight on Tuesday 27th July if you are going to attend so that we can order the right number of pasties! A few logistical points:

- the cost of the pasties will be met from SRCC funds
- a garnish such as potato salad / coleslaw will be provided

- plastic cups / plates / knives / forks will be provided
- please bring your own drinks (although soft drinks will be provided)
- please bring your own chairs
- no sweet will be provided, although tea and coffee will be available.

I will not be able to attend this myself as I will be on a family holiday in Exmouth but we will share the event by proxy, procuring pasties (Devon rather than Cornish) locally....

The August B meeting (on 16th) is, in the absence of positive information from Trinity to the contrary, assumed to be a Zoom based Round Robin – but please keep an eye on the website for the latest position!

Looking further ahead:

- the September A meeting (6th) will be a presentation by Peter G3ZPB on the EMF (Electromagnetic Field) aspects of the recently introduced licence conditions. This is expected to include a demonstration of the RSGB/Ofcom spreadsheet-based field strength calculator
- the October A meeting (4th) will, assuming that access to Trinity School has been restored by then, the Construction Contest originally scheduled for July.

73, Quin G3WRR

THE DOUBLE GANG MAINS SOCKET by Paul G7VAK

On 25th April 2015 I attended the 'Counter Terror Expo' at Olympia, London. I had the good fortune to have certain devices demonstrated by the exhibitor Audioline International personnel.

Trains to my location run at once an hour and rushing to Olympia railway station I caught the train ready for the 37-minute journey. My thoughts about the equipment I had seen were interrupted by my Cellphone ringing unexpectedly; I had been called by KW, an old friend and former colleague. Was I doing anything, and could we meet? I asked the reason and was told 'Not on the phone, I need your skills,' arranging to meet KW in my local public house, conveniently situated close to my railway station.

Sitting in the bar at a partitioned table I asked KW what he wanted and was totally surprised by his story.

"I moved house a couple of months ago and seeing the state of the wiring as it entered the consumer box under the stairs prompted me to rewire the house and install a new consumer unit as the fuses in the old one relied on fuse wire. Whilst changing the sockets in the living and dining rooms as well as the large front and back bedrooms I found these, four of them." KW then reached into his briefcase and pulled out a double gang socket.

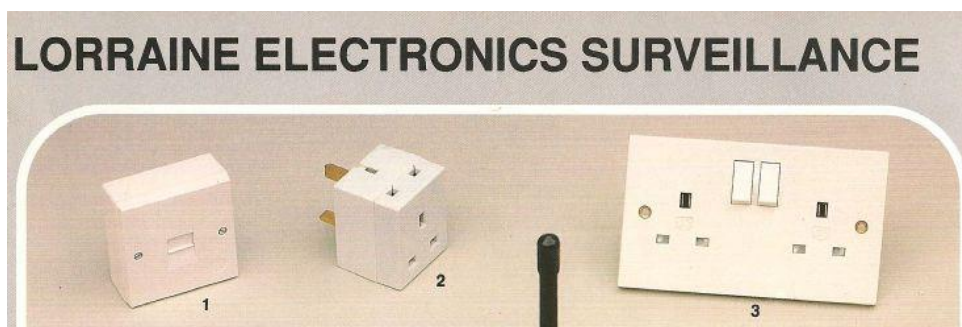
"Very interesting" I replied, "I must have over two dozen of these in my house."

"Not like this" he stated, turning the socket assembly around so I could see the back. My eyes immediately fell to the piece of card covering the void between the two sets of contacts. I noted a piece of card covering a large capacitor, bridged by a resistor and additional wiring leading from socket terminals running under the protective card. I also found a thin, black wire that ran from under the card and along the inner width of the socket and unterminated at the other end;

obviously an antenna.

Looking underneath the socket, along its lower edge, I saw a small hole behind which I was to later find an electret microphone. The device was a bug.

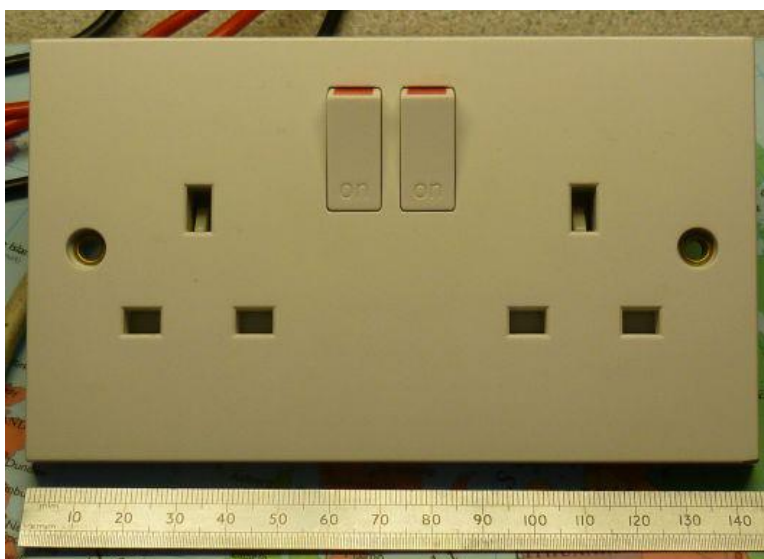
KW told me that he was unable to strip these down properly given the liberal use of 'hot melt adhesive' and that he had destroyed two by trying to prise the hidden parts out with a screwdriver. "Would I like to have a go?" The prize for my work was to keep the unit I had been given.



Such units were previously available from a variety of suppliers in the late 1980's ; Lorraine Electronics, Guideline Electronics in London, Quantek in Birmingham, and Glideglen and Security Specialists Ltd [SSL] in Essex. There was little variation in price; £125 to £175 being the range. There was a variation in the claims; SSL claimed a working frequency in the range 100 to 120MHz and a maximum transmitting range of 1000 Metres.

'Guideline' made no claim of transmitting range but claimed a working frequency in the range of 108 .5 to 125MHz. A mains adaptor with a similar spec claimed 500 yards, the adaptor in 'Glideglen' claimed 300 Metres. Lorraine made no claims about their versions of the equipment.

Experience with a bug using one transistor configured as a collector tuned oscillator and operating at 180MHz allowed monitoring of an audio signal to at least half a mile; it wandered as the battery voltage changed with use and who knows what harmonics would be generated.



Fitted correctly such a modified socket would not look out of place or any different from others; as such the socket would be fully functional. On removal from its pattress, surface or flush, the modification would be obvious.



Behind the socket

Looking at this socket one can see a hint of the vintage of the socket, as sold by the outlet chain 'Wickes.' If this is correct, then the socket dates back to 2006.

Under the Line and Neutral socket part of the power supply is hidden, covered by a piece of laminated card the smaller blue and black conductors lead to the second part of the power supply and the transmitter printed circuit board. The long, black lead from under the card shroud which is spread through the socket is the antenna. The electret microphone can be seen on the bottom of the image.

The card shrouds were gently removed, first by lifting the laminate to expose the fibres and then the fibres gently peeled away.

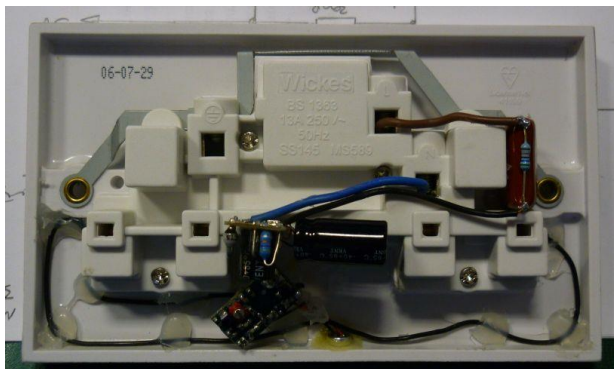
Like the microphone and antenna, the card shrouds and the electronic boards underneath were affixed using hot melt adhesive.

Hot melt adhesive is hard to break but does readily become brittle either through age or with rapid cooling. With the suspicion that the device may be as much as eight years old the 'aging' idea was used to break the hot melt and then, crumble it away from the circuit boards.



For the electret microphone fitted to the bottom of the socket a small hole, drilled for sound admittance can be seen.

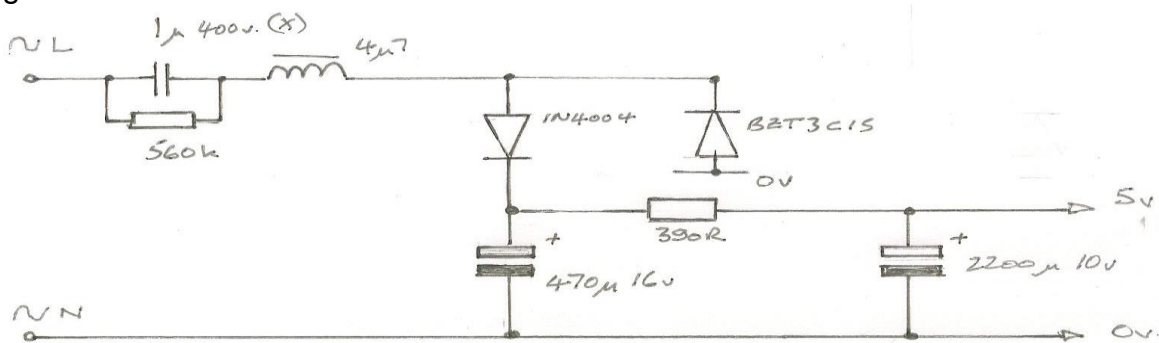
With the card removed the electronics were visible as can be seen below.



On the right is a parallel Capacitor and resistor. The original resistor was a miniature version and

broke during the card removal. The lower solder joint, with the black lead was a dry joint and lifted with the card as it was removed. The black and blue conductors are the power input to the power board.

This power supply is transformerless and its current limited to a maximum of ~20mA. Drawing above that figure will result in a reduction of volts available and a noticeable 50Hz ripple. Such designs are not safe.



Power Supply circuit

It is worth noting when taking measurements that the 0v line is not at earth potential and that mains potential exists. This follows onto the transmitter board also. The ~5v [4.89vdc measured on the sample] is applied to a 3.3v regulator on the transmitter board. The regulator, like the rest of the components on that board are surface mount and like all other components has had the ident/type detail removed. In the image below the volt supply lines can be seen at the top left of the board.



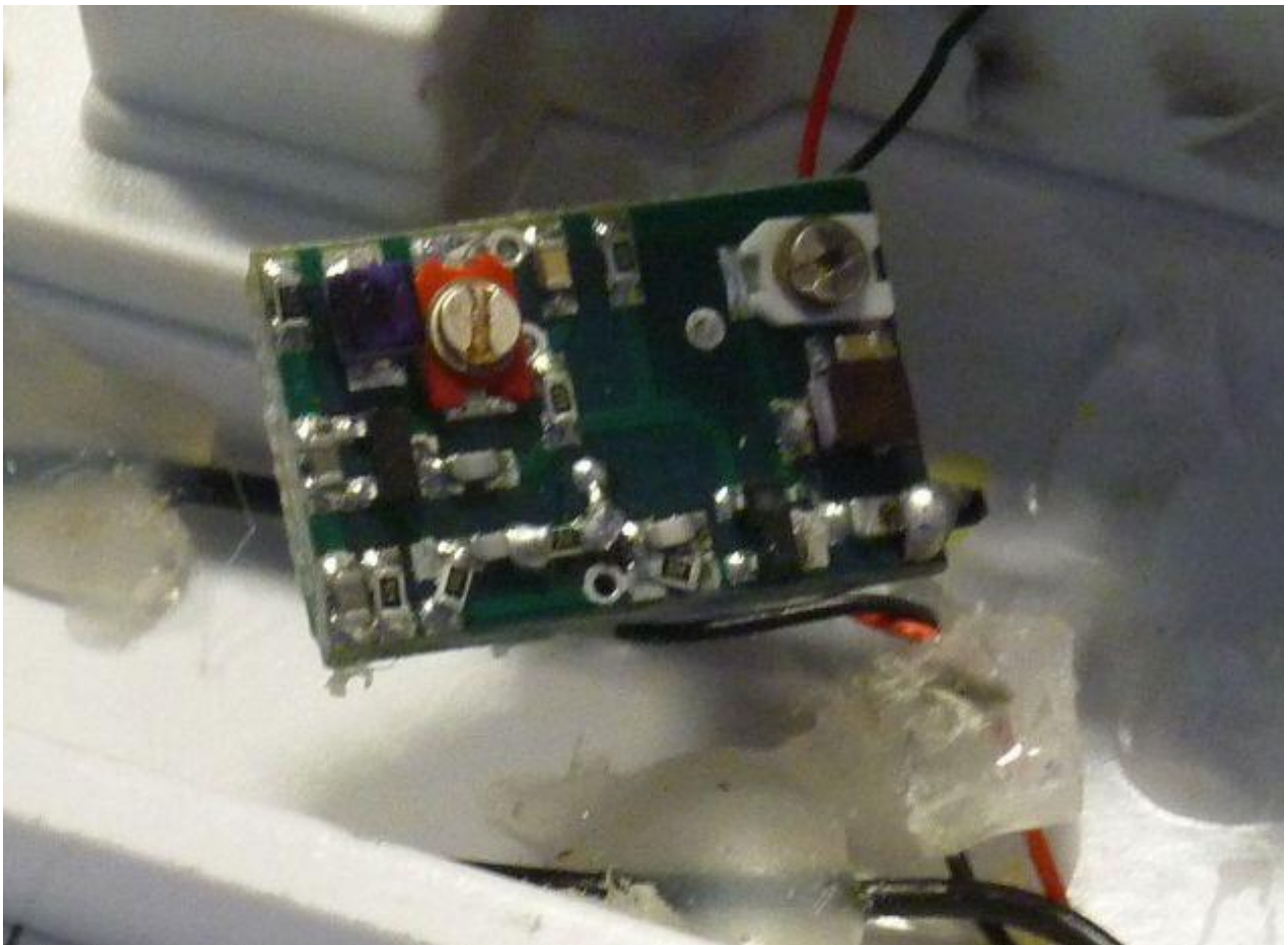
The audio signal is via the red and black wires seen above the miniature trimmer and to its right. The thicker, black wire seen at the bottom left corner is the antenna and 277mm long.

During the removal the crystal from the oscillator came free, a UM5 package. This device will be used as an overtone crystal to allow for the stable generation of the output frequency.



Frequency setting overtone crystal

Without the crystal present the oscillator and final output stage can be seen:



Transmitter Board, Crystal sitting in the centre connecting to vacant pads

The crystal sits in the centre of the board; the red based trimmer allowing the frequency to be set. The white padder is probably used to 'match' the final stage, its transistor seen below it.

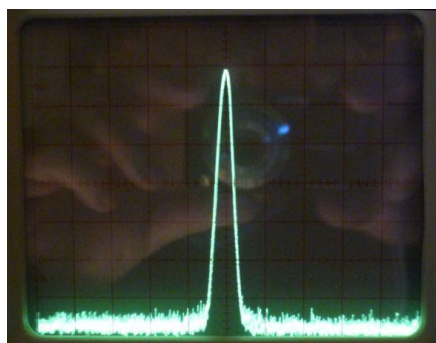


As set up for testing

The device was set up for testing. An Atten AT6011 Spectrum Analyser connected to the IF output of an Icom IC-R7000 receiver. The antenna used was my roof mounted 2M/70cm colinear, about 7 metres from the device. Tuning across the expected frequency maximum indication on the receiver meter [centre position] and the spectral image indicated the correct frequency as 266.3013MHz, the central peak indicating the output at maximum in concert with the receiver



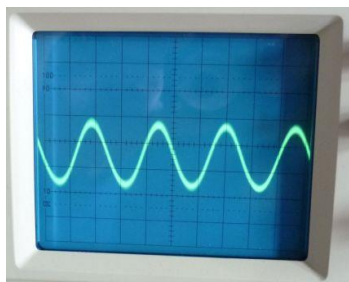
Frequency of operation displayed on calibrated receiver display



Spectral image of Bug's transmitted signal

The lower limit of the spectral image was measured as 266.2903MHz, the upper as 266.3123MHz,

suggesting a bandwidth on some 22kHz, Audio was clean as indicated by the 1kHz tone, displayed on the oscilloscope connected to the Line Output of the R7000:



Audio signal quality seen on oscilloscope

With the device left running and using a Yupiteru MVT-7100 scanner fitted with a rod antenna extended to 280mm [$\lambda/4$ to overcome losses of helix antenna] and tuned to 266.3013MHz the range of the unit was tested. Still on the bench as displayed the carrier was still present and audio intelligible 40 Metres from my house. After that the signal rapidly broke up, becoming noisy and unusable.

To check for harmonics the spectrum analyser was fitted with an antenna and the span sent to two, five, ten, twenty then fifty MHz. There were no visible harmonics. Here we see the device set up for that test:



Searching for harmonics

The signal strength from the device measured from the input via the roof mounted colinear antenna was quite strong given the power and antenna efficiency of the device; here we see the signal strength measurement:



Signal Strength measurement

I was unable to ascertain the frequency of oscillation; like every other component used the crystal

frequency and manufacturer's markings had been removed.

Due to the constraints of my equipment, I was unable to measure the RF output but I would estimate 5 to 7mW as a conservative guess given the input, interstage and antenna inefficiencies.

The two 'destroyed' units were repaired, the damage being more cosmetic than fatal, and along with the other untouched unit tested. Their frequencies of operation were 265.8015, 266.3251 and 266.4013 and obviously allowing easy identification of the room where conversations were being held. Not modern technology, other than the surface mount components, but effective.

These devices are not modern; nowadays cell phone technology has changed how this type of equipment works and its efficiencies. Fitted with a SIM card the 'eavesdropper' now merely rings his bug up to listen, or in the more expensive units play back the last few hours conversation or send it to a host computer as a convenient data packet.

Interesting to note that the Ecuadorian Embassy where Assange took refuge in Hans Place behind Harrod's claimed a bugging campaign against it using SIM technology on covert camera and audio units.

These old socket devices are likely not to have been placed by any government supported agency; they use a totally different technology. Usage of this equipment is likely to be a Private Investigator and for a variety of reasons that can only be guessed at. For any decent range a repeater unit would have been used, converting the signal frequency to another for transmitting at a higher power.

The house KW purchased was of 1948 vintage and boasted only one other owner, a Trade Union and Left-wing activist.

VHF NFD 2021

SRCC took part in VHF NFD over the weekend of 3rd/4th July as usual as part of North East Surrey Contest Group. SRCC provided the 70cm station using the call G3SRC/P. 6m & 4m were provided by Addiscombe ARC using G4ALE/P and 2m by "SRCC & hangers on", to use Alun G4WGE's words, using the call G0SAC/P. We also had considerable assistance from G0JOS & G0KZT from CATS.

The COVID lockdown arrangements meant that we were not able to allow the usual "anything goes" arrangement on site, with people able to visit all the tents at will. The RSGB VHF Contest Committee found it necessary to provide certain restrictions on entrants. The key one was that tents, camper vans etc were to be regarded as "indoor locations" and so the number of people per station was restricted to six. In practice this did not cause any problems. There was also a limit of a maximum of 30 people on site to which I can only say "I wish"! In fact there were a number of members and friends on site during the weekend who were not directly involved with the contest but very welcome nonetheless, These included:

- John G3MCX
- Colin G4LZE who had other commitments at the weekend (I sometimes think this is the amateur radio equivalent of having a note from your Mum letting you off football – but in this case I know it was true!)
- Gareth G4XAT who spent time trying out his UHF (I think 5.8GHz) gear
- Caroline (Mrs. G4FFY) with their dogs Rufus and Bracken (whom until I learnt their proper

names recently, I ironically referred to as Fang and Killer because they were such gentle creatures...I believe Ray and Caroline did not find this amusing...)

- Mike M1CCF (for whom thanks are due for the pictures attached)
- my son Guy and 7 year old granddaughter Francesca (though for reasons that are unclear is always called Moo). Although he is not remotely interested in amateur radio (and thus shows better judgement than his father) Guy came along at the end, having returned Moo to her mother, to help us take it all down – it really is most welcome to have a non-exhausted helper at that stage....

Apologies are offered to any others whose names / callsigns I have inadvertently omitted!

The advance guard, consisting of the 2m & 70cm crews, arrived around 3pm on the Friday at our usual site at Warren Barn Farm near Warlingham. This year hi-tech had hit the access arrangements – Nick the farmer had now upgraded the top gate to electrical operation: arrivals had to call Ray G4FFY's mobile and he in turn called another mobile number which caused the gate to be opened. Hard work for Ray – but greatly preferable to the old regime of visitors having to find the gate key in a secret location – so secret that they could sometimes not find it...). We had the 2m & 70cm stations up and running on Friday evening. The G4ALE/P crew arrived bright and early (well, early anyway) on Saturday morning and were up and working (from a gazebo rather than a tent – an elegant touch, that) in plenty of time. So we sat and complacently whiled away the hours till the start at 3pm clock time. I say “complacently” because when we kicked off on 70cm, we called a fairly local station and – no response! After rather panicky, but fortunately brief, investigation we found that one of the N type – N type patch leads was defective. On changing that out everything worked. This was all very odd as we had been receiving the GB3UHF beacon at great strength, and the linear was showing 100W out and didn't indicate a high SWR! Moral – next year try actually having a QSO during setup....

Readers will be spared excruciating detail of the contest itself (which can be tedious if you weren't there) but the details are tabulated below (which will at least provide a historical record).

BAND	6m	4m	2m	70cm
CALLSIGN	G4ALE/P	G4ALE/P	G0SAC/P	G3SRC/P
OPERATORS	G3VYI G4EFT G4GQA G4SDM M0JSB	G3VYI G4CTP G4EFT G4GQA G4SDM M0JSB	G0JOS G0OLX G1KAG G4WGE	G0KZT G3WRR G3ZPB G4FFY G7PWV G8MNY
EQUIPMENT	IC7300 (100W)	IC7300 (50W)	K3 + xvtr + linear (100W)	K3 + xvtr + linear (100W)
ANTENNA	Dual band 6m/4m yagi (6 elements on 6m) @10m	Dual band 6m/4m yagi (5 elements on 4m) @10m	18 element yagi @10m	28 element loop yagi @ 10m
CONTACTS	75	44	207	70
CLAIMED SCORE	40633	5259	38245	9125

The weather was pretty good for most of the weekend apart from heavy rain about 6.30am on Sunday for an hour or so – seriously heavy as when I had to call Ray on my mobile for advice I couldn't hear his reply! Activity was quite a lot lower than normal for VHF NFD – perhaps due to the continuation of lockdown – and conditions were about normal.

Anyway we all trekked off home by about 4.30pm on the Sunday – in my case at least leaving the task of sorting everything out back at Mission Control Norwood (including hanging the tent up to dry) until Monday! Overall a good weekend – I haven't (yet) heard anyone say “never again” and at least two persons have been talking about what we need to do next year! The following pictures

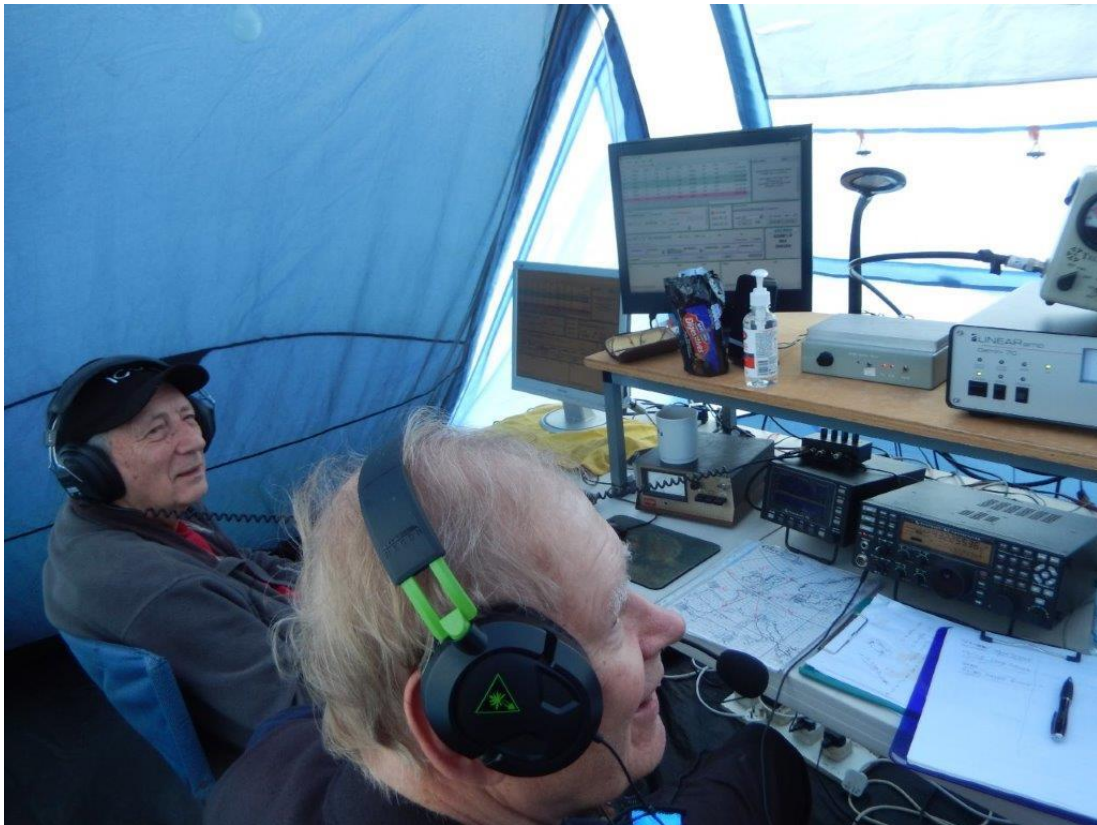
(for which thanks are due to Mike M1CCF) may help to give the flavour of the event....



**2m station
(G0SAC/P)**



**6m/4m station
(G4ALE/P)**



**70cm station
(G3SRC/P) – left
G3ZPB, right
G7PWV**

The results have not been made published at the time of writing, but the feeling is that we can expect to be positioned about the same as usual – typically around the bottom of the top third – but we shall see!

73, Quin G3WRR

FREE TO A GOOD HOME by Pat G4FDN

I have the following magazines “free to a good home”:

ARRL QST 1993-2005 complete years

RadCom/RSGB Bulletin 1968-1990 complete years plus some issues 1960-1967

US Ham Radio Magazine around 50 issues from the 70's & 80's some complete years

There may be more years available by the time you read this as I'm still working through a clearout of my loft. Anyone interested can email me on g4fdn@arrl.net or by phone as per club membership list details

73, Pat

HERE AND THERE

A few months ago, Mike M1CCF mentioned that he was able to get SRCC members copies of a Royal Signals book "Roger So Far" at a discounted price. I took one of these and found it very interesting and of good quality. Mike has now advised me another book by Royal Signals is available, entitled "Tales of the Telegraph" (see <https://shop.myonlinebooking.co.uk/royalsignalsmuseum/shop/product.aspx?catid=157&id=1626> for more details. For those like myself who find the history of communications in general interesting (having joined what is now BT when it was still the GPO and part of the Civil Service) this may well be worth a look. Mike says that if you contact him (m1ccf@talktalk.net) and can collect from Croydon, he will be able to get copies at a discounted price. I've ordered one!

73, Quin G3WRR

SRCC LEAGUE TABLE – JUNE 2021

There were seven entries, from all the usual suspects (except Peter G3ZPB who only made four contacts in the month and chose not to submit an entry) for the June 2021 League Table. The monthly listing shows little change from that of the previous month. The "big three" (Ian M0CGF, Ray G4FFY and Colin G4LZE) continue to occupy the top positions - as they have done for the whole year so far - although their points scored are down by between 24 and 46% from those obtained in May, which was after all an exceptional month. Further down the list, the only change is that Steve G4FYF and Rick M0LEP each move up one place owing to the absence of an entry from Peter G3ZPB. June's listing is shown below:

ENTRANT	WORKED DXCC / SQUARE	WORKED SRCC MEMBER	WORKED IN CONTEST	POINTS THIS MONTH
M0CGF	226	1	19	473
G4FFY	147	2	107	405
G4LZE	142	2	45	319
G3WRR	54	2	55	167
G3EUE	25		13	63
G4FYF	20	1		42
M0LEP	7	4		22

Ian's entry was strongly data mode (almost entirely FT8) biased accounting for 78% of his scoring contacts, the balance being made using SSB. His dominant band was 6m, accounting for 71% of the contacts, followed by 20m (30%), 4m (9%), 10m (8%), 17m (8%), 40m (5%) and 15m (1%). The majority (73%) were with European stations, followed by 15% with North America, followed by Africa, South America and Asia at around 4% each. On 6m he took advantage of the continuing excellent sporadic E season to work – in addition to the more typical extended European paths, he managed contacts with 25 stations in North Eastern USA, Canada and the Caribbean.

All Ray's scoring contacts this month were made on data modes, mostly FT8. The majority of his HF contacts (71%) were made on 20m, followed by 40m (14%), 17m (12%), 30m (2%) and 10m (2%). As with Ian, the majority (56%) were European, followed by Asia (16%), South America (8%), Africa (7%) and Oceania (3%). All his scoring VHF QSOs were made on 6m using FT8 and again took advantage the sporadic E season and the UKSMG Summer Marathon. Unlike Ian, all

but one of his contacts were within Europe – but as he was using a colinear that is pretty good going!

All but two of Colin's scoring contacts (which used JS8) used FT4 or FT8. On HF his best band was 20m (52% of scoring contacts), followed by 17m (28%), 40m (17%) and 10m (3%). The majority of these (59%) were with European stations, followed by Africa (13%), Asia (12%), North America (7%), South America (7%) and Oceania (1%). On VHF, like Ray he used sporadic E and the UKSMG Summer Marathon to build up his 6m score – all his contacts on the band being within Europe.

Quin's scoring contacts were, unusually, all above 30MHz. All but one were on 6m and were a mixture of SSB and CW. That odd one QSO was on 70cm, a quick test QSO with Peter G3ZPB to check out the 70cm gear for VHF NFD! All the 6m QSOs were made in two RSGB contests, and uncharacteristically both of these coincided with patches of sporadic E, one of which being so long lasting that it seemed wrong to term it "sporadic"....

I don't have much detail on Ted's scoring contacts, but he notes that he hadn't had much time for radio in June and describes the contacts he did have as "nothing exciting". Based on his previous operating habits, they were presumably all on CW on the HF bands.

Steve's scoring contacts were a mix of HF and VHF and included contacts made in ARRL and RSGB contacts – and he too had fun with the sporadic E!

Rick, like Ted, did not have much time for radio in June, having spent a fair amount of time gardening. However, he did find time to work a number of SOTA stations – and also worked several SRCC members on the SRCC 80m net.

The 2012 cumulative table (we're already over half-way through the year – where does the time go?) is shown below. It shows little change compared with May: like the June monthly figure, there is no change at the top end of the table. G3WRR moves up two places, displacing G3EUE and G3ZPB by one place, and at the lower end of the table M0LEP and G3SRC change places.

ENTRANT	JAN	FEB	MAR	APR	MAY	JUN	JLY	AUG	SEP	OCT	NOV	DEC	TOT
M0CGF	310	281	313	220	616	473							2213
G4FFY	211	215	252	224	535	405							1842
G4LZE	179	177	239	180	592	319							1686
G3WRR	21	66	62	33	156	167							505
G3EUE	15	60	80	97	140	63							455
G3ZPB	20	136	77	74	51								358
G4FYF	40	36	36	28	40	43							222
M0LEP	22	14	12	18	24	22							112
G3SRC	48	21											69

Although the solar flux index (SFI) continues to vary significantly on a day to day basis, the lack of a consistent improvement continues. However, many amateurs are saying that the current sporadic E season is the best for quite a few years so let's enjoy it while it persists!

73, Quin G3WRR (SRCC Leaguemeister)

SRCC NETS

The following is a list of structured nets on which 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 q.g.collier@btinternet.com.

BAND/FREQUENCY/MODE	DAY OF WEEK	START TIME (clock)
160m / 1905 kHz / LSB	Sunday	9.30 am
80m / 3710kHz / LSB	Monday	9.00 am
10m / 28.078 MHz / JS8	Wednesday	10.00 am
4m / 70.30 MHz / FM	Thursday	8.00 pm
6m / 51.55 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

In addition to the regular Club Nets, several members monitor the local repeater channels, particularly GB3XP (145.6875MHz 82.5Hz CTCSS FM).

THAT'S ALL FOLKS.....

Not much to add, other than to hope that you remain well and COVID free – but I continue to look forward to seeing you again face to face (or in at least one case, for the first time)...whenever that finally happens!

73, Quin G3WRR
SRCC Newsletter Editor

SRCC PASTIE SESSION SUNDAY 1st AUGUST 2021

To take place at 202 Coulsdon Road, Old Coulsdon, Surrey, CR5 2LF starting at 10/c.

I will be attending the above and will be part of a group of attendees.

Name:

Date:

Please send by email to: peterg3zpb@gmail.com