

G3WSC

G6RC

GX3WSC

# CARC News Bulletin

## Crawley Amateur Radio Club

August - September 2017

Editor: John G4PEO

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### Other Clubs

#### Horsham ARC (HARC)

[www.harc.org.uk](http://www.harc.org.uk)

3rd Aug: FPGAs, Rahil Chaudery

7th Sept: DXing from Africa, Nick Henwood G3RWF, RSGB President

#### Crystal Palace REC

[www.g30ou.co.uk/cprec](http://www.g30ou.co.uk/cprec)

4th Aug: Summer Social

1st Sept: Antenna Modelling, by Quin Collier

#### Sutton & Cheam

<http://scrs.org.uk>

17th August: ICQPodcast, Martin Butler, M1MRB

2nd/3rd Sept: RSGB SSB Field Day

#### Mid Sussex ARC

[www.msars.org.uk](http://www.msars.org.uk)

25th Aug: The RNLI

8th Sept: Smart Phones, G4ZCS

#### CATS (Coulston)

[www.catsradio.org](http://www.catsradio.org)

14th Aug: Annual BBQ @ G4CDY

11th Sept: TBA

#### Dorking & District Radio Club

<http://www.ddrs.org.uk/>

17th Aug: Social Evening

26th Sept: ISS Project with Schools, Mick, G4EFO

#### Bromley & District ARS

<https://bdars.wordpress.com/>

15th Aug: Social & On-Air Evening

19th Sept: Short Talks Evening

### Other Meetings/Events

13th Aug: **Hamfest 2017, Flight Refuelling Amateur Radio Society.** (FRARS). BH21 1RJ

<http://frars.org.uk/>

2nd/3rd Sept: SSB HF Field Day

2nd/3rd Sept: 144MHz Trophy

29th/30th Sept: RSGB National Hamfest, Newark

<http://www.nationalhamfest.org.uk>

### CARC DATES

August - Summer Break (club still open)

September 10th (Sunday)

Microwave Round Table

September 27th (Wednesday)

The Major International Rallies 2017

Stewart, G3YSX & Richard, G4ANN

October 25th (Wednesday)

How the www Works, Stewart - G3YSX



CARC meetings are held in our clubroom at Tilgate Park, Crawley, West Sussex.

Every Wednesday: 8pm

Every Sunday: 11am - 1pm

Formal events are normally held on the last Wednesday of the month, 7-30pm for 8pm.

Updates to the CARC Programme:

<http://carc.org.uk/events>

or contact **Richard, G3ZIY:**

[Richardg3ziy@gmail.com](mailto:Richardg3ziy@gmail.com)

For further information about CARC, please

Contact the Hon Secretary, **Phil, M0TZZ:**

[secretary@carc.org.uk](mailto:secretary@carc.org.uk)



CARCRATS - G5LK/P, (Not the two far RHS masts!), Winners of VHF Field Day 2017 Open Section

Photo MOJGH.

### Local Repeaters

**GB3MH:** 145.625/88.5(FM) **GB7MH:** 439.6375(D-Star/DMR)

**GB7EG:** 439.7625(DMR) **GB3WS:** 145.750/88.5(FM) **GB3NX:** 430.850/88.5 (438.450)(FM)

**GB3NS:** 439.675/82.5(FM) **GB7NS:** 439.1625(DMR) **GB7ID:** 430.975 (438.575)(FM/Fusion)

**GB3HO:** 430.8875/88.5 (438.4875)(FM) **GB3HY:** 430.900/88.5 (438.500)(FM)

### Local DX Cluster

**GB7DXS :** Telnet 81.149.0.149 Port 7300

**Chairman:** Keith Evans (G3VKW)

**Vice Chairman:** John Pitty (G4PEO)

**Training Lead Instructor:** Malcolm Harman (G3NZP)

**QSL Manager/News Editor:** John Pitty (G4PEO)

**Committee Member:** John Longhurst (G3VLH)

**Shack Manager:** Mike Davies (GOKAD)

**Hon Secretary:** Phil Moore (M0TZZ)

**Hon Treasurer:** Howard Palmer (G4PFW)

**Exam Secretary:** Phil Moore (M0TZZ)

**Committee Member:** Richard Hadfield (G4ANN)

**Committee Member:** Alex Sheppard (M1YAP)

**Programme:** Richard Drinkwater (G3ZIY)

## Calendar Items - August and September 2017

**August.** No formal meeting for August as we take our summer break, however the club will be open as usual, Wednesday evenings and Sunday mornings.

### **Sunday September 10th - Microwave Round Table.**

It's that time again as we host the Microwave Round Table organised by the UK Microwave Group - UKuG.

From the organiser, G0FDZ:

Again this year following we will be holding a heat for the UK Microwave Group annual Project contest for the G3VVB trophy. Please do bring along your constructed equipment or project and enter. Entries do not necessarily need to have been finished during the last year.

Please note that the contest will also accept software entries as well as hardware. The winner of this round will go on to be considered, together with entries from all the other round tables over a year both before and after this event.

The morning will feature the usual 'bring and buy' sale, so if you have something to sell then please bring it along.

Mike G3LYP will be happy to bring any chip components from the UKuW Group chipbank to you at the meeting. If you have a forthcoming project then why not contact Mike beforehand to place your orders, which are free for UKuW group members.

The program this year as ever offers the microwaver something different – come along and have a good chat, support the construction contest heat and hear the talks.

Below is the finalised timetable:

10:00	Venue opens
12:00	UKuW Group Project contest round judging commences
12:30	Lunch (hot dogs and burger rolls etc and tea/coffee available)
13:30	Opening remarks by Chris G0FDZ and the results of the Project contest heat
13:45	TBD
14:15	The Bodger's Guide to small station EME part 3 – John G4BAO
15:00	TBD
15:30	Break (tea and coffee available)
15:45	TBD
16:30	End of meeting

Please check the website: <http://www.microwavers.org/> for up to date information, or contact Chris G0FDZ: [chris@g0fdz.com](mailto:chris@g0fdz.com)

### **Wednesday September 27th - The Major International Rallies, Stewart G3YSX & Richard G4ANN**

Richard and Stewart will be describing their respective visits to the Veron Rally, Netherlands (Richard); Dayton - new location (Stewart), and Friedrichshafen - both.

## Previous Meetings & Events

### DX-ing from Africa - Nick Henwood, G3RWF, RSGB President

Many thanks to Nick for taking the time out to visit CARC, not only to meet and chat with members, but also to present a very interesting and entertaining talk detailing his radio exploits during his many visits to Africa where he works as a volunteer teaching at universities. To date he has now made over 20 trips during the past 12 years.

Nicks radio interest is mainly HF (CW), and although it can be quite a challenge, he will invariably set up a station whilst there, either employing existing antennas where possible, or more likely erecting an inverted V or similar. Prime consideration for trips is what radio essentials can be easily carried to ensure some sort of signal does get out. High on the list of items in his armoury is of course wire for antennas, plus a catapult and antenna analyser. Although he has held many callsigns for the different countries he has visited, he is probably best known as a result of his trips for his 5X1NH callsign.

Apart from radio, Nick highlighted some interesting sights that he will always remember, such as coming across Exodus Funeral Services who offer coffins in the shape of a car, boat, or coke bottle for instance, or the sight of a family of seven travelling on a motorbike, not unusual apparently. Again, thanks to Nick for a fascinating insight into amateur radio operations in Africa.



### Roll Your Own PCB's - Matt Nassau MONJX

If you are interested in home produced PCB's and missed this very interesting and well presented talk, then, apart from kicking yourself, do try to see it at another club, you will be glad you did. Failing that, look out for a copy of the October 2015 Practical Wireless where Matt has an article detailing his methods under his previous 2E0MTT call.

Firstly Matt told us a little about himself. Born in South Wales but raised in Ontario, Canada, he now divides his time between working as a financial software engineer in the UK and his Spanish wife and family who reside in Spain. Matt has been licensed for three years and also holds two university degrees in mathematics.. He is also a member of the Sutton & Cheam club.

Matt took us through the process, refined over the last few of years to ensure simplicity, consistency, and in true amateur fashion - low cost (cheap!).

Essentially there are four basic steps involved. (1) Create the circuit layout. (2) Mark out the circuit onto the copper board. (3) Remove unwanted copper. (4) Drill holes. Creating the circuit layout can be achieved by using free software, such as Fritzing.org or Diptrace.com. The latter is recommended as it is a full commercial offering with a free licence restricting the user to up to 300 connections which should normally be sufficient. A demonstration of Diptrace showed it to be extremely fast in executing a layout based on a very extensive library of components. For the process to work, printing the layout then has to be done onto ink jet gloss photo paper using a (cheap) laser jet printer. This ensures the printer toner leaves a thin layer of plastic (toner) on the surface of the photo paper.

The next task is to clean the copper board with fine wet and dry followed with a wipe of isopropyl alcohol to ensure perfect cleanliness! The image is then

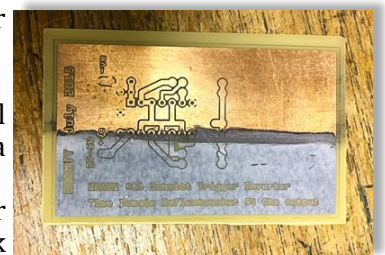
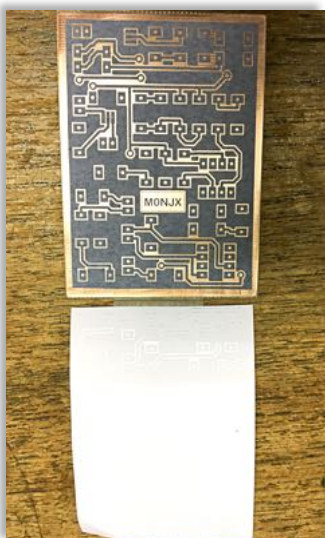
placed toner side down onto the copper and passed approx 12-15 times through a (cheap) standard laminator. The heat process, (yes the board does get hot!), transfers the image onto the copper. Peeling the photo paper off the board should reveal a perfect image on the board and nothing left on the paper. Removal of unwanted copper is accomplished using a mix of aqueous hydrochloric acid (Ebay), and hydrogen peroxide solution 3%, (chemist etc), rather than ferric chloride. See Matt's Youtube video: <https://youtu.be/L732rxR6cXo>

Any remaining toner can be cleaned off using acetone/nail polish remover. The final job is to drill the holes, using a 0.8mm tungsten carbide drill bit.

Once again on behalf of CARC, many thanks to Matt for taking the time to visit and present a very informative talk in a very relaxed and professional manner.



Paul, G7KBR warming his fingers up!



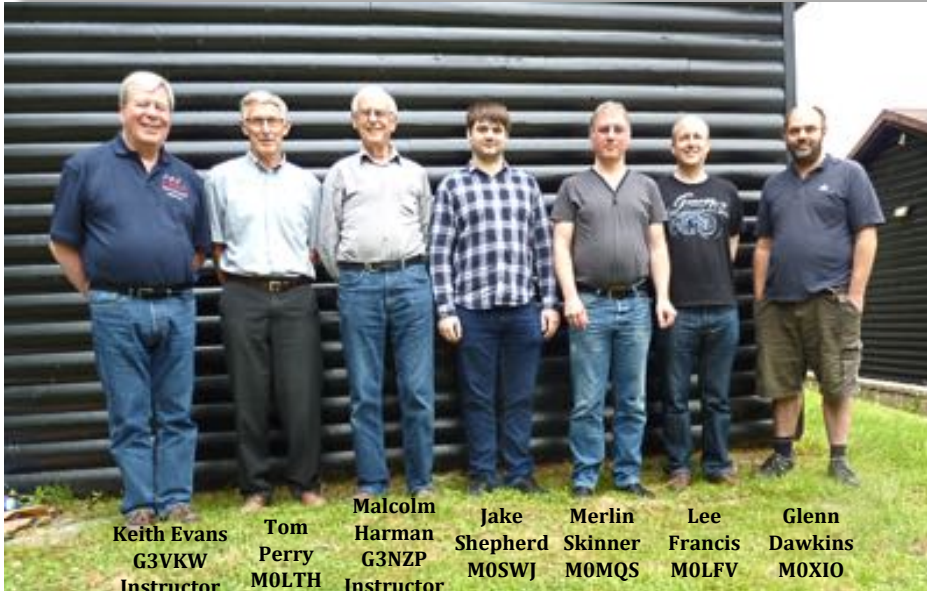
Photos - G4PEO



## Club News

### August Training Topics - Malcolm Harman (G3NZZ) CARC Lead Instructor.

As is usually the case the demand for training has dropped off now that we are into the summer holidays, so the promised Foundation course will probably be in the autumn. Nevertheless I do have some excellent news to report. You may recall that in the June Bulletin we were gearing up for five students to sit their Advanced exam on 25th June, three of whom had taken their previous levels with CARC. So I'm now delighted to say that each candidate has a shiny new M0 call sign and the results included two distinctions and a merit!



Photos G3NZZ



Lee Francis - Our 100th Pass

Now the really good bit, following the success of our five Intermediate students in May the current training team had achieved ninety nine passes over the last eight years, one short of a century, so who was going to be the 100th. It was Lee Francis who checked in first with his result, seen above proudly holding up his Advanced Level Certificate.

### Frequency Counter Project Update - G4PEO

As mentioned in the June/July Bulletin, a number of people expressed an interest in the on-board pre-scaler which would allow measurement of frequencies up to approx 750MHz. **John, G4PEO** assembled 10 pre-scaler kits, all of which have now been spoken for. Similarly John identified a suitable enclosure and components via Farnell and Rapid to enclose and complete the counter, so again 10 kits were made up which also have been spoken for. Screws and nuts for the 10 kits were kindly supplied by **Adrian, G3VJM**.

It was thought a good idea in order to save a lot of plastic bashing/swearing, especially in relation to the display cut-out, to explore the possibility of providing a 3D printed front panel. After trying out a few offerings, **John G4PEO** identified a suitable (free) on-line 3D design package called Onshape. Following a crash course and a few false starts, a suitable design to include built-in stand-offs for the display, keyed holes for the BNC connectors and a strengthening strip to minimise flexing of the panel was sent to **Stewart, G3YSX** to produce on his 3D printer.



Counter Front Panel - Rear View



*G4PEO counter interior showing main board, plus Ebay (£2) 9v regulator board to allow use with 12v external supply. Space available to also add a pre-amp if required.*

Photos - G4PEO



Completed G4PEO Counter

**Club News cont:**

**Next CARC Construction Project - Alan Jamieson M/VK5ZFJ**

The frequency counter project has generated a lot of interest and activity in the club. Clearly many of us like making things. We are now starting to think of the next project. It takes quite a while to assemble kits so we need to plan ahead. The following are some project ideas which have so far been suggested.

1. RF Power Meter.  
A new design of power meter has recently been published. Suitable for small power measurements for filter and antenna analysis, or larger power measurements using attenuators and splitters.
2. 80m & 160m AM transceiver.  
Currently being published in Practical Wireless
3. LC meter  
There is a popular AADE design.
4. QRP SSB transceivers  
There are a number of kits and designs from which to choose: BITX20/40, ILER20, MST3 etc
5. QTP CW transceiver.  
Coming soon from QRP labs
6. Frequency Generator to complement the frequency counter project.  
Would be especially useful if it could provide a modulated output.
7. Modularised Receiver  
Building a quality receiver is a daunting task but doing so in blocks is less so. There are a number of published designs. We'd have to decide on SDR or conventional architecture.
8. Antenna Analyser  
Could use PHSNA/ power meter, Adelaide Hills Radio Club kits or ebay modules.
9. Arduino Projects
  - a) QRP JT65 transceiver
  - b) Weather station
  - c) RF probe
  - d) Talking GPS/ UTC time / Grid Square indicator
  - e) Wave form generator
  - f) CW decoder
  - g) Lightening detector

We'd be interested in any other project ideas. We need a minimum of 10 participants to make any project viable so we will eventually need to find out how many people are interested in each potential project before starting with the most popular.

Project ideas to me please [alanjam@senet.com.au](mailto:alanjam@senet.com.au)

Alan Jamieson M/VK5ZFJ

## Club News cont:

### Club Clothing

Although not a member, (but her dad is the Chairman!), Harriet, M3HJE was so impressed with how good her dad looks in his CARC fleece (!) that Harriet decided to treat herself to one also... Difficult decision, but we think we know who would win this particular father/daughter 'who looks best' in a CARC fleece contest...

With autumn just around the corner, (some will say it's already here), have you treated yourself to an item(s) of CARC clothing? Not only fleeces but polo shirts and sweat shirts are also available and don't forget that CARC receives 5% of all sales as royalties.

Have a look here at the various options available:

[www.ravenspring.co.uk/embroidery-services](http://www.ravenspring.co.uk/embroidery-services)

or call Ann on 01803 867092 to discuss requirements/options/prices.



### Programme Secretary

**Richard, G3ZIY**, would like to handover the Programme Secretary duties at the end of the year, so we are looking for a volunteer to take over the club formal talks diary. If you are interested please speak to **Keith, G3VKW**. Many thanks to Richard for his sterling efforts over the last year.

## Member News

### DMR Home Hotspot by Richard, G3ZIY

At home I now use a SharkRF OpenSPOT DMR hotspot, instead of GB7MH, as reception is hit and miss inside my house.

As I now effectively have my own private repeater, I tend to listen on reflector 4430 when 4400 is busy, and I would like to propose that the DMR users in the club with home hotspots adopt reflector number 4430 as the 'club reflector'. Of course one can chatter on MH using reflector 4430, but it will revert to 4400 after a period of inactivity, so is not really suitable for monitoring a reflector, apart from 4400.

Often the default UK reflector number 4400 is occupied by people who don't follow the recommended use of 4400 ( <http://www.bm-dmr.uk/dashboard/4400%20use.html> ) and move onto a working reflector, to leave 4400 free for other folk to call up another station. So I have got into the habit of changing over to 4430 which seems to be unallocated for anything in particular, and I stay there until 4400 is again free, mainly so that I don't have to listen to something that is not of interest to me.

It's not unlike in the days when 2m repeaters were not so numerous, and the practice was to call CQ on 145.500, the band-plan's designated FM calling channel, establish a contact and then agree a frequency to chat on. That is what should happen on DMR, but often doesn't. I don't think many users realise that when they are chatting on 4400, nearly all the Brandmeister repeaters in the country (like GB7MH) are re-radiating their qso, whereas if they go to a chat reflector only the two repeaters involved are transmitting their natter, thus freeing up the rest of the country for CQ type calls etc., (although one is liable to get flamed for uttering CQ on DMR; the DMR 'police' think it's too old fashioned for such a new system!).

So if anyone wants to get in touch with me on DMR, they can now try 4400 or alternatively 4430.

### Spot the Fake Mosfet

From **Stewart, G3YSX**, a timely\* and interesting link regarding counterfeit mosfets - would you be able to tell the difference? <http://hackaday.com/2017/07/15/lets-play-spot-the-fake-mosfet/>

*\* Coincidentally the article refers to a replacement mosfet reqd for the BITX40 transceiver - see CARC projects (Page 5 )*



## Chairmans Report - Keith, G3VKW



Hi All,

The club has held an examination for five Advanced Licence candidates, three who are club members, and I am glad to say all passed. Well done CARC Members Glen, Lee and Tom.

HF conditions have been very poor for the last few months, and seem to be getting even more dire. The Solar Flux Index ( SFI ) was down at 69 on the 22nd of July, so we really are getting into the bottom of the cycle.

6 meters was showing signs of life, however most of the real Dx Japan, China etc. has been worked on the digital modes of JT65 or the new FT8 which is being developed by Joe Taylor, speeding up the QSO rate, but losing a little sensitivity over the well tried JT65. What is most interesting is that the Digi modes are finding open paths which are not useable with CW or SSB. Mike GOKAD has been using the Club Station and working some very juicy DX. So if you are interested in these modes have a chat to Mike, or Phil MOTZZ.

The club project has seen a much better take up than Alan imagined when he first proposed the Frequency counter project, but now he is looking at possibilities for a constructional project for next year. If you have any ideas have a word with Alan M/VK5ZFJ.

Fairly early, but Mike GOKAD has mentioned that maybe we should consider entering the CQ World Wide DX Contest in the autumn using the Club Station. This is a 48 hour event, and would provide an ideal intro into contesting for newbie HF'ers. We as a club do very little on HF, so it would be ideal way to get your feet wet. Contesting is a good way to hone your operating skills and become a slicker operator. See me or Mike if interested.

We host the Microwave Round Table which this year is on the 10<sup>th</sup> Sept. This consist of talks, components and equipment sales. Last year was the best attendance so far, so put it in your diaries if those frequencies interest you, Also Dicks bacon butties are very tasty.

November is the month of the CARC /HARC Challenge, so we will be looking for club members to participate in this local derby.

Cats Bazaar is also on the horizon, and the Club has a sale table at this event, which we need members to help run. The new venue proved to be highly popular and a great improvement on the old Scout hut.

That is all for now.

73 Keith G3VKW

### For Sale

#### **ICOM IC-7100 D-Star & all mode radio**

HF / 6m / 4m / 2m / 70cm

100w HF / 6m

50w 4m / 2m

35w 70cm

With SanDisk Ultra 32GB SD Card & MB-62 Mobile Mounting Bracket

£680

Contact: [john@g4peo.net](mailto:john@g4peo.net)

