

**Wythall Radio Club** meets from 8pm every Tuesday and Friday evening at Wythall House, Wythall Park, Silver Street, Wythall, B47 6LZ, near Birmingham. Visitors are very welcome. **Wythall Radio Club** is affiliated to the Radio Society of Great Britain. Contact g0eyo@blueyonder.co.uk

## Ladies are on top at Wythall Radio Club

Since our last newsletter we have had the AGM and we have a new committee and officers.

Anita 2E0DUO was elected Madam Chairman

Lynne M6FAB was elected Secretary and Ian M0IDR was re-elected as Treasurer and Membership Secretary.

The new committee comprises; Peter M5DUO, Roger M0GWM, Dave 2E0HPD, Phil 2E0WTH, Lee G0MTN, and Chris G7DDN.

Ex Chairman Mike G4VPD was made an Honorary Member in view of his continuous support and efforts for the club since its foundation in 1982 and more recently as Chairman. He has also taken on the role of 2016 Rally Coordinator. John G3VRF is going to take over the job of meetings organiser from Chris G7DDN. Lee G0MTN will be leading a working party on reviewing and updating the clubs IT strategy and equipment as used in both operating, meetings and training.

A working party comprising Mike G4VPD, Peter M5DUO, and Simon G4TVR spent a Sunday morning re-aligning the antennas on the club mast



*Our new officers, Lynne M6FB Secretary, Anita 2E0DUO Chairman, Ian M0IDR Treasurer*

which had moved in high winds over the summer. Not an easy job but now done.

Between now and the rally next March, which has been renamed as the Wythall Hamfest, it is hoped the radio room can be decorated and re-modelled. We also have the club's Xmas Social to look forward to on Saturday December 12<sup>th</sup> in the Britannia Room and our day as G15YOTA on Tuesday 22<sup>nd</sup> December. (see article later in this Newsletter).

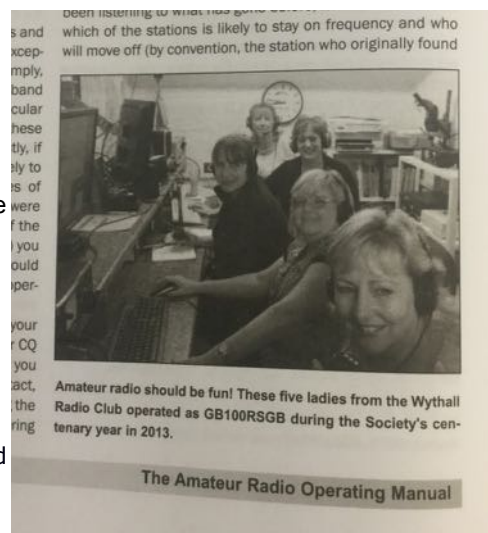
The club and some of its members regularly participate in the RSGB Club Calls contest on 160m and this years event is on Saturday 14th November. Christmas also sees the return of the ever popular Club Christmas Contest, 9 days of chasing other club members for a point and possibly a multiplier. Although not in the calendar at the moment we usually have a DF 2m Fox Hunt on the 26th December. Saturday December 5th also sees the club's annual visit to the Hog Roast at Martin Lynch's Surrey Emporium. Always popular with a good crowd going.

The Radio Society of Great Britain have recently published the latest version of their Amateur Radio Operating Manual and

*Mike G4VPD risking life up the club tower*

in the very early part of the book, there is a photo that caught our attention.

Marie G7OKF, Dawn M0LIJ, Juliet M6RSC, Anita 2E0DUO & Lynne M6FAB were all part of our fantastic G100RSGB team, when we took part in the centenary of the RSGB's foundation in 2013. One of the photos we used for promotional purposes has now resurfaced in the Manual – it was spotted by club member Roger M0GWM after he purchased a copy at the National Hamfest.



*Amateur radio should be fun! These five ladies from the Wythall Radio Club operated as GB100RSGB during the Society's centenary year in 2013.*

The Amateur Radio Operating Manual

# In the Workshop with Ian M0IDR

## ***A very sad looking loudspeaker crossover unit gets a makeover***

Constructed with decent enough components, this poor specimen has been destroyed by a combination of sound vibration and water ingress. One of a matching stereo pair, it shed a couple of vital components whereas its brother on the other channel is as good the day it was made.

Why crossover units?

Nearly all commercially made loudspeaker setups have separate speakers for the bass (woofer) and treble ranges (tweeter). This arrangement gives much greater clarity to the music, but needs the large low frequency content to be filtered away from the rather fragile tweeter speakers.

A crossover is in simplest terms, two capacitor/inductor filters designed to direct the high frequency to the tweeter and the

age destroyed the component to board bond. The crossover units themselves would be subject to considerable buffeting from the generation of the considerable bass rhythms by the large woofer. In the case of the inductor, the only fixing was via a circular doubled sided tape, and the resistor was fixed using hot melt adhesive.

The inductor, being substantial, really needed fixing centrally by a nylon nut and bolt but the compact double sided pcb design prevented that method being used for manufacture and for the repair. In addition a metal clad resistor was used which could be fixed by machine screws was used as a substantial replacement.

Fortunately there was sufficient leadout remaining on both sides of the inductor which in the repair was to be mounted upside down but preserving the original start and finish terminations.

Refurbishment started by carefully removing the remaining cored inductor together with remnants of the broken lead wires from the resistor and inductor. The board was then carefully cleared of as much hardened and surplus hot melt glue. The component mounting holes were then "solder sucked" clear of old solder in preparation for the next stage.

The best way for a solid job mechanically was to fabricate out of sheet 3mm sheet plastic, a platform which could be mounted on but spaced away from the existing circuit board. After measuring and double checking, the platform was cut and drilled to accommodate the inductor, the resistor and the three machine screw fixings which would fix via spacers to the existing pcb. Tails were soldered to the pcb for the two components which would be mounted on the plastic platform.

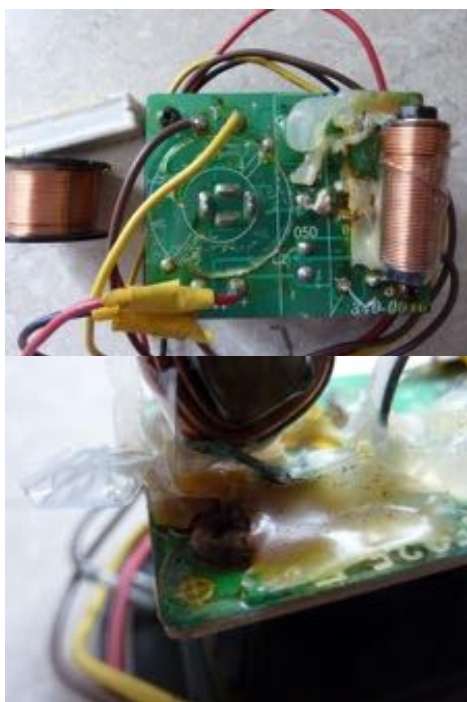
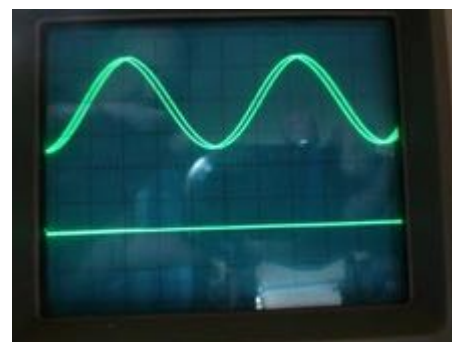
After offering the platform and double checking the holes lined up, the inductor was mounted, upside down, using a suitable nylon machine screw to secure and the resistor was mounted using two suitable metric fixings with shake proof washers. The platform was then assembled using suitable machine screws and spacers which were fastened using shake proof nuts. The resistor was sol-



dered to the appropriate tails and before soldering I checked the inductance of the wound component- for two reasons... just out of interest and to prove that the component had continuity. With both components soldered in place, it was time to check it out using a audio sine wave generator and oscilloscope.

I apologise for the inadequate clarity of the oscilloscope images, but the idea is to show the magnitude of the signals, not their waveform. The waveforms were perfect sine waves, it's just that the camera could not capture them very well and gave multiple traces where in reality there was just the one trace!

In each case, the Upper trace is the signal to the woofer and the Lower trace is the signal to the tweeter.



low frequency to the woofer- a couple of pass filters working at audio frequencies. Two components- a 20w ceramic resistor and a substantial wound component parted company with the board and hung on in there by just the lead outs but ultimately threw in the towel and fell to the bottom of the speaker cabinet. But why? Well I would guess that either the unit had received inexpert attention or water dam-



At 700Hz no output to the tweeter



At 1.8KHz, starting to see a bit of output to the tweeter

At 6 KHz, much reduced output to woofer and a slightly attenuated output to the tweeter.



This is broadly what I would have expected with this unit, the crossover frequency was stated to be 1.6KHz.

Ideally I would have liked a tighter crossover, but they are not very sophisticated units which I expect were built to a price instead of to a specification.

That is quite normal in today's electronics with "will the consumer notice any difference" mind-set from all the manufacturers.  
**In**

The picture of the other two crossover units, the larger of which came from a hugely expensive pair of studio speakers, uses similar circuitry but somewhat different value capacitors, but interestingly the capacitors are non-polarised electrolytics which are reckoned to perform better. Looking at the mechanical fixing of the components, it still leaves something to be desired with the exception of the very large doughnut inductor which is well and truly anchored in place.

**Ian-M0IDR**

*(Editor— Roger M0GWM went to the recent RSGB Convention and being part of the training team, attended the discussion on possible changes to the syllabus for the Advanced course. At present many people feel that the learning "gap" between the intermediate and the advanced courses is too large and changes will be needed. These are Roger's reminiscences of what was discussed at the Convention.)*

### Advanced course

New for the Advanced course will be the introduction of practical exercises. These will be a mixture of practical assessments and/or demonstrations, to assist in the understanding of the theory. Topics to include; Circuit simulation, and antenna simulation (Wythall Radio Club already includes these in our Advanced course, as demonstrations), with students also having to do a practical with the software.

DSP (Digital Signal Processing), and SDR (Software Defined Radio), will be introduced, including the concept of I & Q digital processing.

### My views

I consider that these proposals are the way forward; the inclusion of DSP, SDR, digital filtering, and setting up a sound card for digital operation is not before time. The inclusion of more practical exercises can only be good for candidates understanding of the theory.

Having had a read of the HAREC (Harmonised Amateur Radio Examination Certificate )TR61-02 syllabus (Edition 4; October 2011), which is the EU standard for the examination for a full licence, there does seem to be a mismatch between it and our present RSGB syllabus in terms of depth of content. I don't know if they intend to go as deep as TR61-02, but it does make an interesting read.

**Roger M0GWM**

# SSB Field Day 2015



As is customary, the club entered SSB FD as G4WAC, entering the "restricted" section from one of the park's fields with Lee (G0MTN), Jamie (2E0SDV) and Callum (M0MCX) as operators. Restricted means 100w and a wire antenna with not more than 2 elevated supports and not more than 15m height each. The gremlins stayed away for much of the 24 hours, although Callum's SG230 ATU seemed to fail to tune under the direct midday sun. Dousing in water and putting it in the shade brought it back under control. As the youngest operator, Jamie opted to work all through the night intermittently with Lee supplying the bulk of the daytime sessions. Callum filled in as and when.

We used a TS990 set at 100w with coax to the SG230 and 15m of ladder line to a 60m inverted-V doublet making just under 500 contacts.



## Lessons Learned

Lee and I considered that we should have been quite competitive given the numbers of operator hours achieved, but the claimed scores showed we were beaten strongly by another station with a similar setup to us. However they used a flat-top doublet rather than an inverted V like us. Would that have made the difference?

We have subsequently made some investigations using MMANA to model our inverted V -vs- our competitor's flat top doublet. It transpires that for 40m and 80m, it wouldn't make that much difference to the overall gain figures whether you build a flat-top or an inverted V. But assuming you

are using a big doublet (circa 25m+ element legs) the flat-top really starts working on the higher bands where we're reaching more than half a wavelength above the ground.

The graph shown is the 20m analysis with the Inverted V on the left - and the Flat-Top on the right. You'll notice the flat-top has a much lower angle of maximum take-off angle. Our greatest gain was at 32 de-

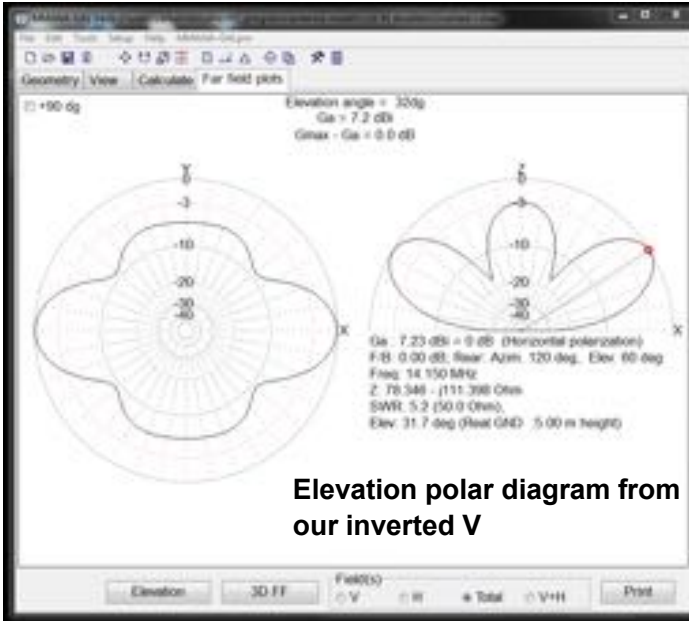
grees off the horizon but our competitor's flat-top was running at 19 degrees. On the 15m and 10m bands, the flat-top is even better. Of course, the gain isn't rotatable so choosing exactly where the masts go in the field becomes critical to secure the greatest number of SSB FD stations.



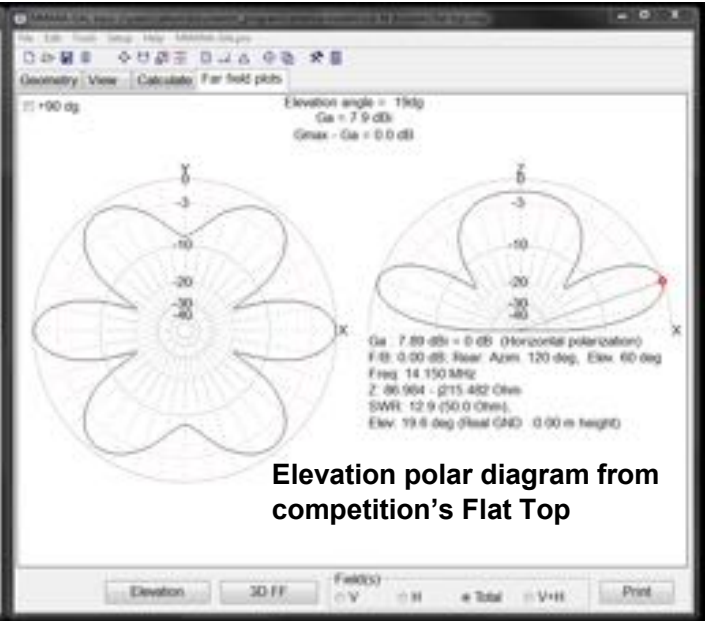
Conclusion: This antenna explanation is only relevant to long element doublets that need to work effectively on the higher bands too. Mono-band dipoles (inverted V or Flat-top) have only small differences in gain. So feel free to continue putting your G5RVs and small back-garden wire aerials up in your garden. It's unlikely you have a 15m mast to worry about!

**Callum M0MCX**

# SSB Field Day 2015 continued..



Elevation polar diagram from our inverted V



Elevation polar diagram from competition's Flat Top

## G15YOTA SES at Wythall in December

YOTA (Youngsters on the Air) is an established Amateur Radio youth programme, supported by the IARU. Every year, the month of December is designated as "YOTA Month", which aims to encourage young people to get on the air and experience Amateur Radio.

The National Amateur Radio Societies in many countries are encouraged to set up a number of special event stations in December, to promote amateur radio to younger audiences and to encourage them to get on the air. Each special event station is identified by the "YOTA" suffix and an award scheme exists to encourage amateurs to work as many YOTA stations as possible throughout the month. Our own "Young Operator" Jamie 2E0SDV is the Region 5 member for the Youth Committee and asked Wythall if they would be prepared to put on a SES so we applied to the Youth Committee and were awarded the SES G15YOTA call sign for Tuesday 22<sup>nd</sup> of December.

The only requirement in hosting the Special Event Station, is that the station is operated by young people (<26 years old) and we are hoping that Jamie can persuade other young operators in the region to participate with a session on the club station on that day. We will provide adult supervision during the day and if any club member wants to volunteer for a supervisory session then please let Chris G0EYO know as he is the

holder of the NOV for the day. Chris will also be making an appeal to other clubs in the West Midlands region to see if they have any young operators who would like to come along and operate our station.

At the time of writing we are unsure how public we can make this event given the access restrictions we have with the club shack. More information will be forthcoming as we get nearer the event but we certainly want to give the young operators the chance to use our multi-band station to make contact with other YOTA stations around the world.

**Chris G0EYO**



# More on the Workbench—A Nissei 308 desk mic

Regular readers may know I am a fan of the Adonis or Nissei SJCD308 Desk microphone. This keenly priced microphone offers a perfect solution to those who do not wish to purchase one of the “big three” solutions.

AM-308



This microphone benefits a dynamic mic insert, buttons for PTT and PTT lock as well as up/down. It has a space for battery power ( 2 AA batteries), but as most rigs supply either 5v or 8v via the mic socket, it is easier to simply utilise this ready made voltage.

Being a generic mic that can be used across most makes and models, the microphone connections terminate in a 8 pin chassis plug on the back panel and the user has to purchase or construct a suitable patch cable to suit their rig. The connections are easily found by searching the web, indeed the only thing I could not find was the circuit diagram which would have been useful.

A trader at the Hamfest had this mic for sale at a good price and it was soon snapped up by a member of the Wythall Radio Club. I made up a lead to suit Yaesu connectivity and was somewhat embarrassed when there was no audio,



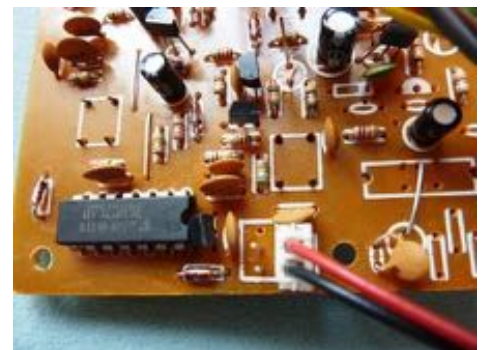
all other functions seemed normal except the red led showing the status of on or ptt did not work.

Thinking my lead was at fault I used my tried and trusted “patch panel” where I can connect any pin from the rig to any pin on the mic, but again, no audio. On the bench, I found that one lead on the led had been snipped! but a new led was quickly soldered in place. Looking at the circuit board, there are 2 separate 2 way connectors- one for battery supply and one for the input from the mic insert. Whilst browsing the internet for information on the 308, I found a couple of images of the circuit board and they both showed the connectors were reversed. The above pictures show the correct orientation of the wiring from the battery and mic insert to the pcb.

The above picture shows the connections as found.



You will see that I have removed the white shell of the second connector to show there was room for a 3 pin one which would have been a more foolproof solution. Correctly fitting the plugs to the pcb produced a fully working microphone.



I had prepared myself for component level fault tracing and was relieved to find it was a manmade fault, there are around 7 transistors and loads of diodes plus a IC in this microphone and tracing the audio would have been by the method of injecting an audio signal and tracking it through.

Until the next visit to the workbench, I will say 73

Ian M0IDR

# RSGB 2015 Annual Convention



Nine club members travelled to Kent's Hill Conference Centre in Milton Keynes in mid-October for the RSGB's Annual Convention. The Convention runs from Friday evening through to Sunday afternoon. Some delegates stay for the duration, but many others just come for a day trip. From the Birmingham area getting to Milton Keynes took 'just over an hour' for some members travelling by car, and not that much longer if you took the wrong motorway junction as I did...

The RSGB Convention was originally two conventions – one for HF and one for VHF. The VHF event was held at Sandown Park in Surrey for many years. This comprised of a large VHF-centric rally with trade stalls, plus a lecture programme. The counterpart HF weekend event was more focussed on lectures, with much socialising in the bar and an evening dinner.

The VHF event was discontinued around 15 years ago (?) with the pressures of rising costs and reducing visitor numbers that have seen many of our smaller radio rallies similarly disappear from the calendar. The HF event continued, although it moved venue and location throughout the UK. From 2009 onwards some VHF content was introduced into the HF Convention programme, and soon afterward the event was re-badged as the "RSGB Convention."

So what happens at the Convention? It's definitely not a rally with trade stands, although the principal sponsor Martin Lynch and Sons do have a presence with a num-

ber of radios and accessories on display for demonstration and sale. The main focus is on the lecture programme. There are usually 4 or 5 separate lecture streams so there are a variety of topics to choose from at any time. For example this year there were presentations from DXPeditions to far flung islands, how to operate remotely, sporadic-E and meteor scatter, the Summits on the Air programme, and even how to put a Raspberry Pi to good use in your shack.

I have heard comment that the sound of a 'convention' appears too formal, or that many people might find the lecture content too difficult or not enjoyable. I'd strongly recommend everyone try it at least once – several of the lectures were specifically aimed at newcomers to particular topics, and many were aiming to be as humorous as they were informative. Also this is a good opportunity to hear from and chat to some of the leading lights in the hobby who are making real innovations. Some of the presentation slots are workshops on DX'ing, and others are trophy presentations. We were very pleased to see Jamie 2E0SDV awarded the G5RP trophy. All levels of UK Amateur Radio examinations were undertaken during the weekend too.

Visitors can attend as many or as few lectures as they wish. For a couple of years I was so busy catching up with old friends I barely had time to attend

any, but I did make an concerted effort this year. Outside of the lecture rooms there were two large areas for use by visitors. Kenwood and Icom had stands demonstrating their latest radios, there was an RSGB bookstall, and other special interest groups like Direction Finding, and Microwave groups were there to chat to over the free coffee and biscuits. This year there were two special event stations running – one from the Kenwood stand with a TS990 available for use, and another from the famous Camb-Hams Flossie vehicle and its 60 foot mast.

Lunch is available on site, and for those staying for the weekend there is the option of choosing one of the Gala Dinners to while away the evening, which comprise a three course meal interspersed with some fun from the master of ceremonies. I was just a day visitor this year but enjoyed talking to other amateurs I'd never met face to face before, another who had just passed his Foundation exam that afternoon, and even some visitors from Italy.

Some of the most popular talks this year were recorded, and will hopefully be made available for viewing online over the next year. So let's try to get more club members to attend next year – car sharing is an easy way to do this - and increase the Wythall presence there for 2016.

## Lee G0MTN



# How I got my American Ham License—Mark M0LXG

*"Some British amateurs take the US exams at the RSGB Convention to get licensed in the US - mainly so that they can use 1,500W while they are maritime mobile"*

I think it was John (G3VRF) who mentioned it in passing at the club one evening last year. I was a new foundation licensee at the time, and the prospect of using such phenomenal amounts of power on a boat was of no interest to me. But the idea of obtaining a US licence sat in the back of my mind for a while.

Married to an American, we travel to the United States on a fairly regular basis. With relatives in the mid-west, the Colorado Rocky Mountains and just outside Orlando, Florida, we have no shortage of pleasant and interesting places to visit. Amateur, or should I say, 'ham' radio appears to be a much more mainstream hobby there, so ever since I rekindled my interest in radio, operating in the US is something that has been high on my 'radio bucket list'.

Of course, operating in the US is something I can do under reciprocal agreement with the full UK licence I gained back in June. However, moving to the United States is not something that my wife and I have ever ruled out. In fact if they recognised my professional qualifications there, we would probably have already made the move. Obviously if we were to ever relocate and I wanted to continue using my radio, I would not be considered a visitor so would therefore need to obtain a US licence. Ofcom's US counterpart, the Federal Communications Commission (FCC), does not offer reciprocal licencing, so once fully licensed here, my thoughts once again turned to the prospect of taking the US exams. It made sense to take the exams while the learning I had undertaken for my advanced exam was still fairly fresh in my memory, so I ordered the ARRL textbooks for the technician and general class licences from Amazon and patiently awaited their transatlantic delivery.

The American licence structure has some similarities with our own. There are three levels of licence: technician, general and amateur extra. As you would

expect, each tier progressively allows more operating privileges, though you are permitted the full 1,500W at all levels!

**Technician** class is restricted to VHF and above with CW only on extremely limited sections of some HF bands. It is technically comparable to between the UK foundation and intermediate levels.

**General** class allows access to most of the HF bands, but restricts some bands to the ITU region 2 areas such as 3.800 – 4.000 MHz, leaving 3.600 – 3.800 MHz exclusively to extra class operators. This is done to purely encourage progression to the highest level. The technical content is somewhere between the UK intermediate and advanced levels.

**Extra class** grants full access to all of the bands and I think most would agree it is more technically detailed than the UK advanced level.

Probably the most fundamental difference to the licencing system is the examinations. Exams are multiple choice, with a pass mark of 75% at all levels, but are comprised of questions from a published pool with associated diagrams. Updated every four years, each pool may be freely downloaded online which offers a lot of advantages for the student and a number of disadvantages for the operator. It is of course possible to just learn the answer to every question without ever understanding any of the content. But that's for another discussion!

On their delivery, I set about reading through my newly acquired books. I must admit I was very impressed with the ARRL books compared to their RSGB equivalents. While most of the content was familiar to me, licencing conditions naturally make up a significant portion of the syllabus. The maximum height above ground that an 'antenna structure' can reach without permission of the Federal Aviation Authority and the FCC just had to be learnt – it's 200 feet.

Rather interestingly, questions are often asked about which portion of bands may be used but no band plans are provided, or any other reference material for that matter – it's back to the days of learning formulae.

So after a good few hours of reading and many attempts at mock exams using various resources, 11<sup>th</sup> October was upon me. I made my way to Milton Keynes armed with my ID, my FCC Registration Number (FRN), my mother-in-law's address details and a few positive thoughts and joined two others in room N110. Roger, M0GWM popped his head in to wish me luck and I handed over my £10 and the exams began. They curiously do not have a time limit, though we were advised that it would be nice to be finished before it got dark...

Assuming you pass each exam, you can proceed to take the next level without additional cost, meaning you could in theory take all three exams on one day for £10 and then exchange it for a full UK reciprocal licence! If you do happen to fail an exam, you can retake it immediately for another £10.

The technician and general class exams that I had prepared for posed no problem, with scores of 94% and 100% attained respectively. I attempted the extra class exam anyway and surprised myself with a score of 35 of out 50. Two marks away from a pass, and better than I had achieved in the two or three mock exams I had taken online, I was actually very pleased with this fail.

I left clutching my ARRL pass certificate which has since sadly fallen victim to my wife's spilt nail polish remover. But 15 days later, my new callsign KE0GGA was added to the FCC database and I am now starting to prepare for my next attempt at the extra class exam, something I would like to do on my next visit to the US.

**Mark M0LXQ (and KE0GGA!)**

