GLOUCESTER AMATEUR RADIO & ELECTRONICS SOCIETY

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RAGCHEW

SEPTEMBER 2020

FROM THE EDITOR

Firstly an apology for an absence of a "Ragchew" in August. Events conspired against me - a busy time in our bookshop following our re-opening plus completing a greenhouse project consumed a large amount of time.

The easing of lock-down measures has enabled some /P operation which several club members have managed to take advantage of including **Dave G4BCA** who was on Dartmoor for the August 2m UKAC - read about his experience in this issue.

Anne 2E1GKY submitted an article to **"Radio User"** magazine which was published in the September issue - many congratulations Anne! By kind permission of the editor **Georg Wiessala,** the article is reproduced in this month's "Ragchew"

Also in this issue **Richard M0HNK** follows up his article in the March 2020 "Ragchew" on his **VLF Converter for Grimeton Radio** and reports an Alexandreson Day success.

I've managed to make some limited progress on the **Raspberry Pi** project - see my report in this issue.

Malcolm G6UGW continues his series reviewing the Radio Spectrum from 300Hz - 300GHz and this month he describes the Very High Frequency band 30MHz - 300MHz.

"Antenna Teardown" this month features a name well known to Amateurs and also the TV trade in the 1960s/70s - **Jaybeam.** Having set out on this journey of discovery, I realised that I needed to be able to carry out some tests and as it was my birthday in July, I persuaded **Leta G4RHK** to buy me a **NanoVNA-H Antenna Network Analyser** - read my initial findings in this issue.

Leta and I recently called by to see **Roy G3VZR** and we found him in good spirits. He sends his best wishes to all members.

Members will have read in the July Bulletin that it is highly unlikely we will be meeting at Churchdown School until 2021. Please keep the club spirit alive by joining in the various club nets, and finally please feel free to submit an article for publication in **"Ragchew"**

73 Brian G4CIB (g4cib@outlook.com)

October "Ragchew"

Copy please by Saturday 26th September

Contest Roundup by Brian G4CIB

In the August 2m UKAC **Dave G4BCA** operated from near Poundsgate on Dartmoor - see his separate report. We are maintaining **20th position** in the **UKAC Local Clubs** table, and it's interesting to note that in the points breakdown for the club, 432 MHz is in the lead followed by 144MHz, with 50 MHz hot on its heels and 70MHz not far behind.

In both the **144 MHz** and **432 MHz FMAC** results table**,** the club is in **4th position**, out of 27 and 20 entrants respectively.

In the **80m Club Championship** the club finished in **7th position** in the **Local Clubs table** - well-done to all who participated - your call signs are listed below on the results certificate.

The Autumn Series has now started on 80m - see the RSGB website for full details.

The **VHF Championship results table** is compliled from the results of the following contests:-

The March 2m/70cm (The overall 2 band normalised score), 432MHz Trophy, May 144 MHz, 50 MHz Trophy, 144 MHz Low Power, 432 MHz Low Power, 144 MHz Trophy, 70 MHz Trophy, 1.3 GHz Trophy, 2.3 GHz Trophy and the 10GHz Trophy.

In 47th position overall **M0XAC** and myself entered the **50 MHz Trophy,** and in the **432 MHz Trophy** the club was represented by **G4IZZ, M0XAC, M0HFY** and myself.

G4BCA/P FROM DARTMOOR

On Tuesday 4th August I operated from Dartmoor in the 2m FM Activity Contest and 2m UK Activity Contest. The site was the car park at Bel Tor, in the middle of nowhere but not too far from Poundsgate. I'm used to operating from home with limited loft antennas in these contests, and being at 350m ASL was a real change and a treat.

Set-up was an FT-991 on the back seat of the car and for the FMAC I used 10W FM to a mobile whip. For the UKAC I used 50W to a SOTABEAMS 3-element yagi up at about 20 feet. It was quite windy but I just got away without having to guy the yagi, probably because it is quite low-profile and lightweight.

I had a listen around before the FMAC started at 7pm local time, and there were two quite loud French beacons. Then to my surprise I heard ED1ZAG beacon in IN53RE (Spain) at 579! All off these were off the back of the beam as I had set the heading towards Gloucester before the contest started.

In the FMAC I worked a few local stations, one of whom was on 145.400 MHz which was also occupied by some French stations engaged in ragchewing. I also worked Stewart G0LGS/P on Cleeve Hill (196km) and M1DDD/P in IO93 (338 km on 10W FM!!). I decided to 'paper log' the FMAC so that the laptop battery was preserved for the UKAC.

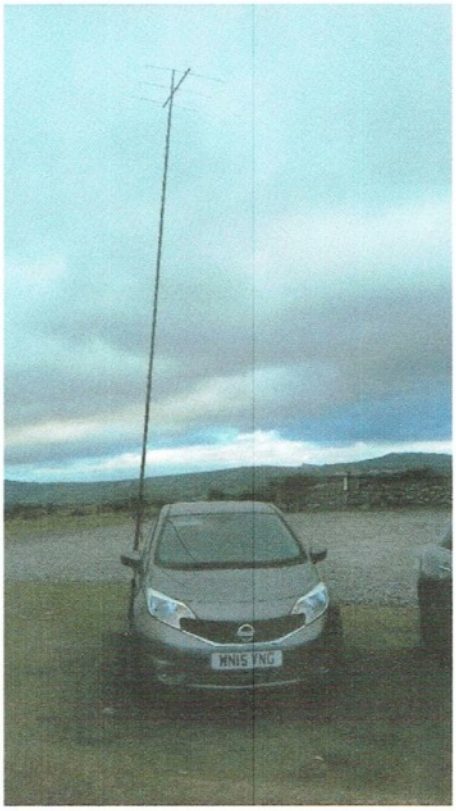
At 8pm and it was time to switch to the beam for the SSB contest. This was wall-to-wall signals and I could have worked many more than I did, but was engaged in trying to work club members from back home. I started off 'running' on 144.358 MHz in the hope that the Gloucester stations might hear me. No luck on that first of all, but I worked 10 stations in the first 12 minutes, including two French stations off the back of the beam. One was F6APE at 426 km. The run then dried up so I switched to 'search & pounce' mode.

Later, Brian G4CIB/P and I managed a QSO with an exchange of 55 each way with deep QSB, so that was brilliant. I ended up with a total of 30 QSOs with 12 locators

(each 'big' locator square in these contests counts as a multiplier). Many of the QSOs were over long distances so that enabled me to clock up a relatively high claimed score of 11,201 pts.

Amazingly, nothing went wrong, but I did struggle with the laptop keyboard in the dark (head torch next time!). I packed in early at 9.45 pm local time (these contests go on until 10.30 pm), when there was just a glimmer of light to help take the antenna down without too much trouble. Overall, a very different experience to operating from home, and very enjoyable. I'm looking forward to trying the same site again, maybe on a different band, although the darker nights are now creeping in.

Dave Tunnicliffe, G4BCA



Many thanks Dave for submitting this article and glad you had a brilliant time operating on Dartmoor.

I would be glad to receive more articles about members /P operating.

Please submit to

g4cib@outlook.com

Just a reminder that back-issues of "Ragchew" are available to view on the GARES web site g4aym.org.uk - click on the "Library" tab.

The Radio Spectrum by Malcolm G6UGW

Part 6 - Very High Frequency 30MHz - 300MHz

These frequencies correspond to wavelengths between 10m and 1m. This part of the spectrum contains many services including FM broadcasts, television broadcasts, line-of-sight ground-to-aircraft and aircraft-to-aircraft communications, land mobile and maritime mobile communications, amateur radio and weather radio.

(Series to be continued)

Anne Reed 2EI GKY
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ANNE REED

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A Woman's Lot is Amateur Radio

Anne Reed reminisces on her amateur radio education, wonders where all the women-hobbyists are, revisits radios she has loved and tries to avoid trapping her gardener husband with too many wires in her garden.

I first became interested in radio at the very early age of about ten when I used to visit my Grandfather who had a 1947 Cossor Model 470. This had a walnut-veneer plywood cabinet and cost £21-11-6d plus purchase tax!

I would watch him with great interest tuning along on the short, medium and long wave bands. My father had a Bush DAC90 in a brown Bakelite case. My own first purchase was an Ultra Coronation Twin Model R786 made in 1953, which was a very good radio but alas, it got broken in 1961 when moving to Cheltenham.

On a visit to the RSGB 1988 Vintage Show at the NEC, I spotted one for sale, but it cost nearly £100, so I had to withdraw my interest. The Tandy shops were always a magnet, and over the years I purchased various base and handheld scanners. My favourite CB base transceiver was the York 869, and this helped me on my way for transmitting practice. I made a very good friend, Roger Provins, who also became a radio amateur (GORGJ) and helped me with my learning.

My main CB antenna was a Delta Loop, which looked like a sailing ship and was just a bit too noticeable.

The heavy-duty brackets support my 6m-antenna to this day.

In March 1997, I decided to get cracking towards an Amateur Radio Licence and plucked up the courage to sign on for the very last Amateur Radio course held at Gloscat in The Park, Cheltenham, from September to May. I found this rather a long slog, but I did attend every week.

The tutor liked all board work and would take up to 30 minutes explaining certain circuits. About nine of us attended this course, and some at the back of me regularly fell asleep!

I prayed for some practical work, as there was an antenna on the roof, but there was only one demo the entire term. I did have one go at the *City and Guilds Radio Amateur Examination* but found it too difficult.

After a short gap, I decided action was needed so I studied the RSGB Novice paperwork and noticed it was more 'hands-on. I decided to take the plunge, as it were, and I wrote in to the Gloucester Amateur Radio Society (G4AYM + G2HX). http://www.g4aym.org.uk/default.htm

Brian G4CIB's letter was most welcoming, and everyone, including Vernon GOHTO, gave me some marvellous help. I took the very last Gloscat Novice Examination in a room all on my own and was successful.

Since then, I have continued to enjoy my amateur Radio Licence to the full. I have been an RSGB member since 1985. I am now an active Committee member of the Gloucester Amateur Radio and Electronics Society, having held the posts of Assistant Treasurer, Treasurer, and Secretary.

At present, I am RSGB Examination Secretary for the club. I also enjoy operating.

I have always been very concerned that, sadly, women seem to be left out of the amateur radio hobby.

Moreover, when I peruse the list of new

Fig. 1: Anne on QRZ at Crickley Hill Club.
Fig. 2: The Club's 2019 Construction Contest.
Fig. 3: A visit to Gloucestershire Airport.
Fig. 4: The 2019 BIWOTA Special Event Station.

members in my recent issue of *RadCom*, most of those listed were male. This makes me feel quite sad - where are all the ladies?

My thoughts on this are that a lot of men may already have some engineering experience or a near alternative, which appears to make things so much easier, even when studying for the amateur radio exam.

Maths was not always one of my strong points. In terms of other necessary knowledge, I must admit to finding things difficult when going through the various processes.

However, I have been lucky, in that my father was an engineer and draughtsman,

Also, my work in the motor trade, from 1961 onwards here in Cheltenham, certainly gave me some much-needed additional help.

I do think that the three-tier exam system has been a big success. I note that things have been slightly updated more recently. As the Examination Secretary for our Gloucester Amateur Radio and Electronics Society Club, I enjoy meeting other members weekly, as well as operating out-of-doors, be it on a canal-side or the local hills.

I find that putting out a call say on 2m, one never knows exactly who will return your call; several years ago, when taking part in an interview on our Gloucester BBC programme, the interviewer said amateur radio was like putting out a fishing rod to see who would come back.

I have always tended to be a Yaesu person; currently, I operate the FT7800.

I also use a Watson W30 antenna, which works extremely well on 2m and 70cm.

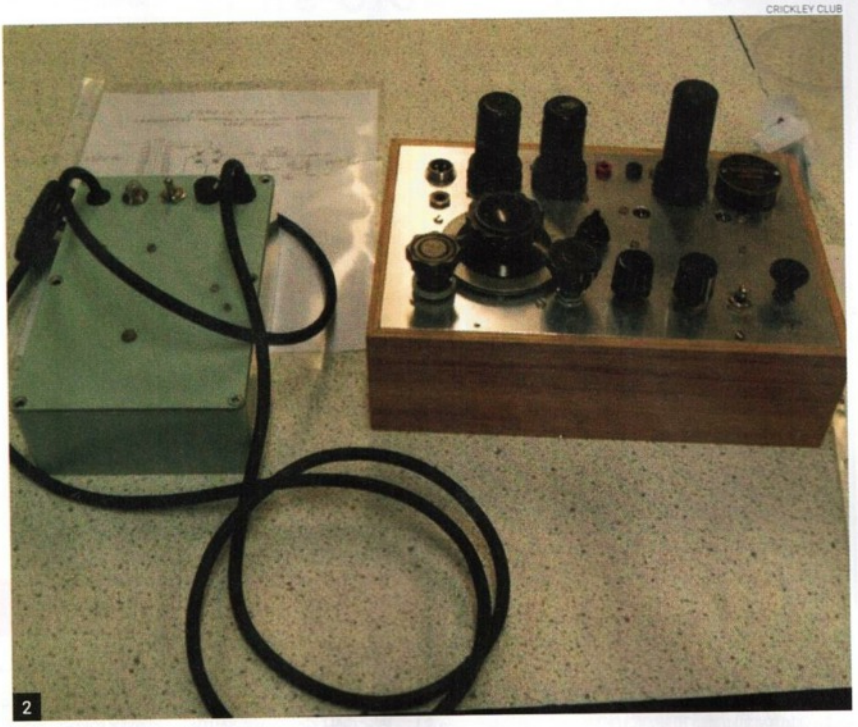
The aerial is situated over 16 feet up, at the back of our bungalow.

I also operate the FT857, FT897, and FT450D models, and the odd handheld.

My husband is what you could describe as dedicated to his gardening hobby as I am to mine. He is a judge for country shows, but let me tell you he is not at all keen on any wires crisscrossing the garden for HF.

Therefore, I have to make use of an end-fed running along the fence. I think I might change to a dedicated Vertical very soon; that way, the other half will be happy to regain some wooden poles in the garden.

CRICKLEY CLUB



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CRICKLEY CLUB

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Even with nearly 59 years of marriage, this October one has to tread carefully!

[This is an updated and edited version of a text first published at the URL, below.

*Where, indeed, are all the ladies in the hobby, amateur radio or DXing? What makes you take up this hobby? Does it depend on your training? Get in touch with me and tell our readers about it – **Ed**.].*

http://www.g4aym.org.uk
https://www.qrz.com/db/2E1GKY

CRICKLEY CLUB

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5th July 2020 - An Alexanderson Day Success!

In the March 2020 edition of 'Ragchew' I briefly touched on the problems I'd had in trying to receive the Very Low Frequency (VLF) transmissions from the Grimeton radio station in Varberg, Sweden. I then described an upconverter I'd designed in an effort to overcome these difficulties.

Grimeton (callsign SAQ) is the only station still operating that uses an early twentieth century system for transmitting cw. This involves an Alexanderson alternator which generates alternating current at VLF (in this case 17.2 kHz) and is a technology which flourished briefly in the period following spark gap transmitters before being eclipsed by valve technology. Grimeton once formed part of a network of stations which provided transoceanic communications at VLF and is a fascinating part of radio history, being designated as a World Heritage Site by UNESCO in 2004. Nowadays, Grimeton transmits at Christmas and on Alexanderson Day which falls in late June or early July although there are occasional extra transmissions from time to time.

I'm pleased to say that my upconverter performed perfectly and I copied the beautiful hand-keying from both the morning and afternoon Alexanderson Day transmissions without a problem. I used a wire antenna about 23m in length feeding the high impedance input of my upconverter. In relation to my garden this is a long wire and I had to zig-zag it to make it fit. But in relation to the transmission it is pitifully short, being little more than 1/1000 of a wavelength. Even the 2km antenna at the Grimeton transmitter is electrically short and inefficient!

I sent off 559 reports for both transmissions although I felt that the afternoon transmission was perhaps very slightly stronger than the morning one. Interestingly, I later discovered that the operators were having difficulty with a wet antenna to begin with so perhaps my rather uncertain and subjective impression did have a foundation in fact.

I am not aware of any other planned transmissions until Christmas. But for those who might be interested in hearing the transmission and seeing how the pre valve-era equipment operates, there's some excellent Youtube footage which you can access via the Grimeton website (https://alexander.n.se/successful-alexanderson-day-2020/?lang=en). The virtual tour around the station is particularly fascinating, especially for those who appreciate a steampunk aesthetic!

Richard (M0HNK)

Raspberry Pi – The Story So Far – Part 2

by Brian G4CIB

Last month I described how I successfully installed FLDIGI in my RP3B+ but then realised I needed to consider some more basic applications if it was to become my shack computer. The first thing to investigate was a logging system. On Windows I have used Winlog32, Log4OM, N1MM logger (for HF and VHF contests) along with Minos for RSGB VHF contests. For some time I've run Winlog32 and Log4OM in parallel, transferring data via ADIF files on the basis that a duplex system gives me some redundancy should a disaster happen with either one. Back-up files are also created when exiting both loggers.

The choices on the RP as far as I can see are limited to CQRLOG, PYQSO and XLOG.

For an initial trial I decided to try CQRLOG. I had no problems downloading and installing this software and the setting-up menus were pretty straightforward. Features abound, including a Contest mode but this is fairly basic – the manual does warn the user that it's not designed for the dedicated contester. One feature is does lack is a Net option. This is where Log4OM is excellent and is particularly handy when operating on the GARES nets. Call signs are pre-loaded into a notepad. You open the net, drag the call-signs present into a sub-log, and when you click "Close net", all the participating call signs are logged into the main log with start/finish times etc. As I said, sadly this feature is not on CQRLOG. The only "export" option is an ADIF file, unfortunately no Cabrillo option which is required for RSGB HF contests. At the moment I am logging where possible on CQRLOG and on a weekly basis, exporting an ADIF file to import to Log4OM and Winlog32. Exiting CQRLOG automatically creates a back-up of the log into a memory stick plugged into to the RP.

I used the Contest facility in CQRLOG for the 80m Club Championship CW contest on Monday 6th July. I did have a problem with CAT control – not a fault of the CQRLOG software or the RP3B+. A few RF issues were quickly solved with ferrites attached to various leads. With no Cabrillo option, I exported the log in ADIF to Winlog32 on my Windows computer and generated the Cabrillo. XLOG claims to support Cabrillo, so that is on my list to investigate further.

As a regular participant in the RSGB VHF UKAC series, the next software I investigated for the RP was Minos. Although Minos is Windows based, buried in the Minos website is a page devoted to building it with Linux. In the words of the header "At the moment, Minos under Linux has to count as "advanced", as you do need to know your way around Linux". Undaunted I pressed on and remarkably emerged at the other end with Minos successfully installed on the RP. There is, however, one last thing I have not cracked. For some reason it will not start from the icon in the menu and I have to type in a command line in the appropriate screen. I successfully used this logger for the July 432MHz FMAC, the 432MHz UKAC, the August 144MHz FMAC, and the 144MHz UKAC.

(to be continued)

NanoVNA-H - A very tiny handheld Vector Network Analyser

By Brian G4CIB

In the Autumn 2017 “Ragchew”, Martin 2E0KZU reviewed the Metrovna VNA Pro Touch Analyser, a compact handheld antenna analyser offering a wide range of features retailing in the region of £275. Since then, the internet has become awash with smaller generic Vector Network Analysers sold under the heading of NanoVNA and retailing in the region of £50. Are they worth it?

I decided to invest £50 – or more accurately Leta invested the £50 – it was my birthday!

It arrived nicely boxed and comes with a selection of SMA connectors but with no instructions and at first glance there is something odd – the SMA plugs are all slightly different. Once again, there is no shortage of details on how to use the NanoVNA on the internet. All is revealed – one SMA is a 50 ohm dummy load, one SMA is a short circuit and the third an open circuit.

The analyser covers 50kHz – 1.5GHz. You need to calibrate the unit each time you use it, which seems a bit of a pain – but it soon comes as second-nature. The calibration consists of setting the frequency range you wish to examine, then applying the shorted SMA, then the open SMA and finally the 50 ohm dummy load. Having calibrated the instrument you connect to the load and choose the display option you need. As with the MetroVNA, the options available are:-

SWR
Gain
Insertion loss
Return loss
Isolation
Impedance Z.
Resistance R.
Reactance X.
Phase.
Transmission Loss.
RF level in dB.

Also like its more expensive cousin it has two modes namely reflection mode (S11) to measure an antenna via SMA socket CH0, and transmission mode (S21) where it can be connected in series with a circuit, via a second SMA socket CH1.

My initial impressions are that it’s a useful piece of kit for the money. In view of the price I cannot vouch for the accuracy – but it least you can get a rough indication of how an antenna is performing.

Antenna Teardown - Jaybeam 8 element 144MHz Yagi

By Brian G4CIB

Any amateur who was around in the 1960s through to the 1980s would have been familiar with the name "**Jaybeam".** The roots of the company can be traced back to 1945 with the start of high-definition television from Alexandra Palace and a requirement for household TV antennas. For a full and fascinating history of the company, visit the web site https://g4hfq.co.uk/ and click on the link "G2HCG articles". For those not on the internet, I'm more than happy to print a copy and post to you (SAE please!)

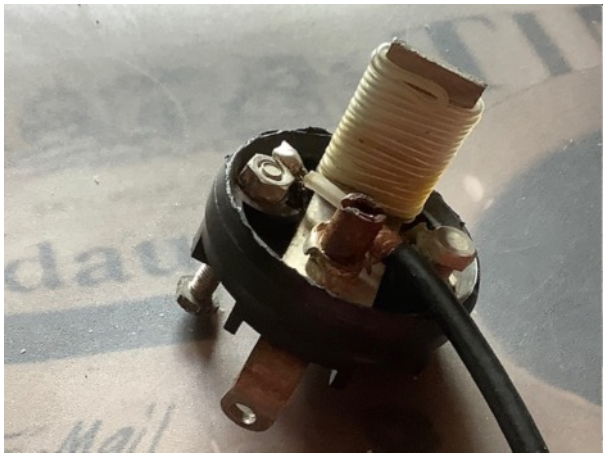
I've had my Jaybeam 8 element 144MHz yagi for the past forty-odd years and it has only required one repair – a broken element which I replaced. The boom splits into two so the antenna can be used as a 4 element or 8 element.

Theory

What on the surface appears a mechanically simple arrangement is theoretically quite complex. The Yagi antenna (or more strictly the Yagi-Uda antenna) comprises a driven element with parasitic elements – in this case a reflector element and either 2 or 6 director elements. They are called parasitic elements as they are not energised, power being fed only to the driven element. The parasitic elements re-radiate the signal slightly out of phase to the driven element, and either reinforce the signal in some directions or cancel it in other directions. To obtain the phase shift, the elements need to be made either inductive or capacitive relative to the driven signal. It was found that if the element was made inductive, it reflected power away from the parasitic element. Thus the element behind the driven element reflects power back towards the driven element and is referred to as the reflector. If the elements are made capacitive relative to the driven element it was found that the induced currents were in such a phase as to direct the power in the direction of the parasitic elements, hence these are called directors. How is this achieved in practice? To make the reflector inductive, the length is increased slightly, in the order of 5%. Conversely, to make the directors capacitive, they are shortened also by about 5%. Adding additional directors increases the forward gain and narrows the bandwidth, also the addition of the reflector and director reduces the feed impedance at the driven element.
This is a very simplistic description of the Yagi antenna but will suffice for the purposes of this article.

The Antenna in Practice

The Jaybeam 8 element 2 metre Yagi comprises a folded dipole as the driven element. This has a feed impedance of approximately 300 ohms and the addition of the reflector and directors brings this down to approximately 50ohms balanced. The antenna boom comes in two sections and can be used as a 4 element beam (the reflector, driven element and two directors), or an 8 element beam by adding the second boom section and four extra directors.



To enable 50 ohm coaxial cable feeder to be used, a balun is incorporated into the flexible plastic moulding at the antenna feed point. The balun used in the J Beam is something you won't see in any text book, being a loop of wire wrapped around an aluminium former and is in fact an inverse balun. Photo (left) G0ULH

In next month's article I will be testing the antenna with my NanoVNA-H analyser.

A view of the assembled 8 element J Beam yagi. As a manufacturer of television aerials the company was well equipped for the manufacture of items for the amateur radio market. The feeder junction box (shown below) contains the “balun”.

Before Amateur Radio

By Brian G4CIB

My paternal Grandfather was a professional gardener, starting his career in the early 20th century as a journeyman gardener and being a native of Nottinghamshire he learnt his craft in Newstead Abbey and Welbeck Abbey. Just after the First World War he applied and obtained the position of Head Gardener to a Mrs Gwynne-Holford at Buckland House, near Brecon where my father was born in the Head Gardeners cottage in 1920. When, soon after Mrs Gwynne-Holford acquired Hartpury House, my grandfather and family moved into the Head Gardener’s cottage, Gwynne Villa located near the back entrance to Hartpury House in Murrells End. My grandfather’s gardening skills rubbed off on to my father as everything had to be “just-so” in my father’s garden in Longlevens. A lot of my childhood was spent helping dad in his garden where we grew all our own vegetables. Some of dad’s skills have rubbed off on to me (but not a lot), and having always wanted to have a greenhouse, this was realised some 15 years ago when a car-club friend who was moving house gave me his greenhouse - dismantled of course. Somehow I never had the time to put it together - but the Covid 19 lockdown spurred me to get it sorted. So during the past few months the site has been cleared, slabs laid, the frame erected and the glass installed. Finally a few weeks ago the project came to fruition. As I was moving plants and various stuff into the greenhouse, I was reminded of a GARES Jumble Sale held in the early 1980s at St Aldate’s Church off Cotteswold Road. It was there that **Pat G3MA** brought along a nearly new Aladdin Greenhouse heater which I purchased, thinking it would come in handy one day. Little did I think it would take 40 years!!!!