Newsletter

Chesham & District Amateur Radio Society

We meet the 2nd and 4th Wednesdays of the month at the Whitehill Centre, Chesham, HP5 1AG

Welcome to the May edition of our newsletter

Welcome

Firstly my thanks to Terry (G4UEM) for last months 'my shack' and Dave (G8FMC) for this months talk on his 6m + 4m Moxon yagi. This newsletter represents the club and the members activities, thanks for your input.

With the current lock-down we all have to find something to do to stop 'cabin fever', we all do different things to acheive this, why not let on and give us a few ideas?

My current 'antenna regime' is suffering with high winds doing a little damage, more on page 13.

73 Bryan M0IHY

In this issue

Chairman's Ramble

Greetings to all in the 6th week of lockdown.

First, I would like to say a massive thanks to everyone who has done so much to keep the activities of the club going, in the absence of meetings.   The Wednesday night net has been very well supported and there has been a good deal of traffic on the email group. We have even had three people involved with myself in slow CW practice on a Thursday.   Special thanks should go to Bryan for all his hard work in running a Foundation course and creating a tremendous tool, now on the website, through which exam candidates can obtain and answer test questions, with those answered incorrectly providing the relevant references to the foundation course book, or any other resource used.

Congratulations to Guy (M7GUY), (how did he persuade Ofcom into that?) who has obtained his foundation licence and the best of luck to Peter and Paul who have their exams on 15th May.   The RSGB have taken a necessarily pragmatic approach to the course, particularly the practical elements though from the emails I have seen, those elements would not have formed a barrier to any of the three.

Sadly, as you know, we have had to cancel the event at Brill Windmill which would have taken place on 9th and 10th May. However, we have the callsign and Ofcom have waived the normal requirement of a special licence that the public have access to the event. This means that we can still use the callsign over that weekend and will be doing so. If we were at the windmill, we could operate on multiple bands at the same time, and there seems to be no reason why we cannot do that from our home locations, using the special event call, (but not more than one on a band at any one time)!   We will be putting together a schedule of bands and times though the timing does not have to be exact and I will contact GB2RS to get something in the bulletin this week-end.

As to future meetings, the next one of these would be on 13th May. That may not be possible, but with a review of restrictions on the 7th, we have decided not to cancel that, as if it can go ahead, we can run a station from Ashley Green to try out the location. That can be organised quickly. In that large hall, social distancing should be no problem, though we will have to bring our own beer.

73 for now. Jeremy. (G3XZG).

The Editors Musings

This past month has seen people settling down to the lock down, finding things to do to occupy their time, and as such Angie has almost redesigned our back garden, now we have artificial grass where shingle was, and reclaimed space I'd robbed for my various antenna's, her rotary clothes drier has now been re-instated with a warning attached, "Not to be used as an antenna under any circumstances", that's me told then!

The panic buying seems to have subsided with the shelves being a little fuller than before the onset. Both Angie and I use the home delivery service offered by various stores. In the past 6 weeks we've put a total of 2 miles on the clock in the car, down to the doctors and back twice, that's all we're allowed to do! Today we received our "stay at home" letters from the doctors surgery, dated the 24th of April with instructions to remain under lock down for 12 weeks from the

date of the letter, that will be a total of 18 weeks under "house arrest" - hmmm...

My thanks to Matt (M1DTG) for his help into the world of hand held radios, once you get past the barrier of the front menu and the fact the manual is translated Chinese, they're quite good, I purchased mine with idea of using it while out in the car, seems like that's on hold now...

M0IHY

6m + 4m Moxon Yagi by G8FMC

A low visual impact 4/6m dual-band antenna „ for almost zero cost!

In 2010 we had an enforced QTH move to a disabled friendly bungalow for my wheelchair bound wife. We ended up in Winslow, Bucks, not far off a plateau but in a bit of a hollow & with some severe tree & large house screening! A number of discrete antennas above a low-roof bungalow would be VERY visible. I had a tilt-over scaffold pole mast system of max height about 8m AGL. This was counterbalanced, so could be tilted over to change antennas/experiment single-handed without risk fairly easily.

Original design concept (Established in 2011-2012):

1. Moxon rectangle on 4m & 6m stacked inside each other. (Original Moxon dimensions, NOT the current 'improved' more extreme rectangle, which does not dual-band well!)

2. Part tube/part wire construction on 1" tube boom. The centre part of elements of tube construction, mounted on a boom as in a conventional Yagi. The 90deg folded ends to the elements of thin wire (almost invisible from a distance) giving a conventional 'yagi-like' appearance of overall width only that of a 4m antenna.

3. Boom 1" round, length approx 6ft (standard old band 1 or band 3 TV boom)

4. Additional director for 4m to be fitted; full length or short with wire extensions as other elements?

5. Thus a total of 5 elements (2 on 6m & 3 on 4m) on a 6ft boom; light in weight & suitable for basic rotator.

6. Separate coax feeds; 6m direct to Elecraft K3 & 4m to OZ2M transverter.

The evolution of my design!

Before actual construction started I had studied a lot of literature including L.B. Cebik's article "The 64-(Euro-) Dollar Question". This deals with the pros & cons of the Log-Periodic versus a dual band yagi for 6/4m. Most of the current popular 4/6m Dual-Band Yagi's are derived from this earlier work.

Using the Moxon calculator I constructed the 2 rectangles for 50.2MHz & 70.2MHz, using mainly old band 2 & 3 TV antenna parts, with the wire ends & string insulators.

I have an "AA-230PRO" from Rig Expert. (Expensive but VERY good) This enabled me to perform many SWR scans very quickly.

I mounted the antenna on a mast, fixed in a 'Patio umbrella' stand about 7ft AGL & pointing up by about 15deg. This puts the more sensitive 'Director' end a little higher and farther away from the ground, buildings & me. (It is proven that pointing straight up works quite well; the Reflector can be quite close to the ground with minimal detuning).

Initial scans were very disappointing, with resonances seeming to be about 5 - 8% high in frequency, with some rather strange curves!

A whole lot of experimentation & development followed & I learnt a lot! I went away for a re-think & re-read of the literature several times.

It seems that the outer (6m) rectangle would not be detuned very much by elements inside but the (inner, higher frequency) 4m rectangle was likely to suffer more due to the elements outside. I therefore optimised the 6m rectangle on its own first. (My Moxon ended up slightly trapezoidal, due to using old S/H ex TV hardware!).

Re-fitting the 4m rectangle did NOT change the 6m resonance by much at all. (Agreement with the literature/theory - result!) The 4m SWR curve was a bit strange & still dipped at a high frequency. There was also some interaction depending if the feeder of the antenna NOT in use was terminated or left open-circuit.

Parasitic Excitation - using just one feeder:
At this point I had another ponder & read more about the subject, particularly regarding 'parasitic excitation' of the higher frequency element when 2 driven elements were in close physical proximity, with just the lower frequency one driven. (Some years on, this is now an accepted technique & quite common!)

A (good quality!) coax switch at the rig end would select the radio in use.

The L.B. Cebik 7 element 6/4m yagi partially adopted this philosophy with close spaced driven elements, but included a transmission line coupling from the 6m feed point to the 4m dipole centre as well. This results in a dual driver system (used for many years in some commercial HF multi-band beams).

Further development with 3 elements & then 4 elements on 4m brought me to the current situation:

6m is a 2 element Moxon. 4m is a 4 element Moxon/Yagi with the first Director close-spaced, mainly performing a matching role (as in many modern Yagi's) all on a 6ft boom.

The feed is taken to the 6m Driven element, but this is also connected by twin feeder to the semi-parasitic 4m Driven element.

Testing & 'on-air':
The antenna was put up on my mast & Initial scans on the AA-230PRO looked rather good; with not much change from when tested near ground level (actually an improvement, probably due mainly to the coax loss?)

A quick check on the 4m beacons indicated this 3 element Moxon-Yagi Hybrid was about 2-3dB better than my (modified and optimised) HB9CV. So about +6dBd? (8.15dBi) (Later verified by comparisons with a 4m Dipole)

Testing of the Moxon-Yagi hybrid 'on-air‹ during some 4m & 6m contests in spring 2012 was quite gratifying, netting me 8 squares on each band at each session, from a fairly poor-average QTH. The best QRB (from IO91NW):

6m: G4FZN/P in IO94JF, 256km;
4m: G4FZN in IO84WK, 291km;

With the AA-230PRO connected to the PC I ran some scans of SWR with very pleasing results. It would seem that the dual feed etc. gave a rather broader-band antenna than discrete separate yagi's. With NO interaction between feeders, as there was only one!

The Front-to-back ratio's are quite poor so further development should have been done. However it was usable & only intended as a 'Low visual impact' temporary antenna for the neighbours to 'get used to'!

Computer optimisation and/or further experimentation could improve these figures & maybe make the Moxon-Hybrid look a little better?   I have yet to get into the computer programs for antenna design, just relying on knowledge of basic antenna theory, an awful lot of reading plus an instinct for what seems right! (Plus my trusty 'Rig-Expert' antenna analyser)

Is this the way to go to satisfy my original requirements, or should I not worry about 'visual impact' & maybe try a dual band quad? (Maybe the subject of a separate article?)

Well, about 8 years on I am still using my 'Temporary' antenna, although I do have a 4 element Dual-Band Quad being built to (approximately) one of Justin's designs (G0KSC).

Dave (G8FMC)

The post

Strange things are afoot...

I ordered watchmakers magnifying glasses for use with my FT897D/SDRplay 1a project and after 4 weeks had to reorder them because they hadn't arrived, within 48 hours the reordered ones arrived, strange...

My 20 metres of coaxial cable (LRM400 equvalent) arrived within 12 hours of ordering on eBay (now that is fast!).

A special TNC to LRM400 plug arrived today, problem was the packet was empty with an apology from the Post Office suggesting I made a claim against them, it looked like the package had been run over by a truck - hmmm...

I'm waiting on some PL259's (similar to the expensive Messi & Paoloni type) to arrive from Ireland, I dread to think what'll happen to them!

M0IHY

Security in the shack

Many of us have strived to get the equipment we want, but how many of us are actually conscious about security? This need not be an expensive, nor a complex system to install and maintain, I will describe the system I've installed in my shack.

The Raspberry Pi Zero W is a compact computer measuring just 64mm * 30mm and ideal for the task, below is a list of components I purchased to complete the project.

1. Raspberry Pi Zero W starter kit - Amazon - £23.00, this includes everything you need with the exception of a 5V power supply and camera, and a form of storage (if required).
2. Unistorm Raspberry Pi Zero Camera Module 5MP - Amazon - £11.99.
3. Power supply - eBay - £6.00

The above prices were correct at the time of writing.

From the parts described (and shown) above you will notice I have not included another form of storage. There are many ways to store the images the camera takes, a) The SD card, for this you will need a large(ish) card, 32GB should do, or b) a network hard drive, or c) a flash drive (this is the option I chose).

The lid chosen (you are supplied with 3) has mounting points for the camera on its underside.

Let's get going then, there's a tutorial on https://dronebotworkshop.com, I followed this but found a couple of places that weren't fully explained.

We need "motioneyeOS", if you do an internet search you'll find many instances of downloads, I used GitHub, make sure you get the appropriate image for your computer as there's a version for each Raspberry Pi type.

Next, burn the image onto the SDcard, there are many types of software to do this Balenetcher and WinDisk32Imager are 2 that I know of, I used Balenetcher.

motioneyeOS can work headless, in other words it doesn't need a monitor, but initially it needs a monitor to get it running first time, the steps described here will eliminate the need for an Ethernet

connection.

Next we need to 'fool' the computer not to look for a wired (Ethernet) connection (its default action), this involves adding *wpa_supplicant.conf* onto the boot area of the SD card, I used Linux to perform the following operation and this is how I did it.

1. Plug your SD card (I use an SD card holder) into your computer.
2. Using a Terminal session find your SD card, I use the command df -h at the prompt, this lists all filesystems, look for your SD card, mine is listed as /dev/sdb1 with /media/pi/7033-2245 in its Mounted on column, be careful as there may be more than one SD card attached!
3. Type sudo nano value in Mounted on column/wpa_supplicant.conf this will open the nano text editor.

   The following is the text you need to type:

   country=GB

   update_config=1
   ctrl_interface=/var/run/wpa_supplicant

   network={
           scan_ssid=1
           ssid="You router SSID (name)"
           psk="your router password"
           }

4. Press ctrl and x and answer Y to saving and press [RETURN].

Insert the micro SD card into its slot on the underside of the Pi Zero W PCB.

You are now ready to initially run the software.

1. Install the camera onto the PCB, the ribbon cable fits the socket at the opposite end to the SD card holder.
2. Clip the camera into the lid (it can only go one way round). I find it better to remove the paper from under the camera itself to expose the double-sided tape and push it firmly onto its PCB, this way the camera will rermain attached to the PCB (mine fell off several times, hence this explanation).
3. Place the SD card into the slot on the PCB.
4. Insert the PCB into the case tipping it slightly so as to get the board under the lip inside the case (opposite the plugs) and press gently, you should hear a slight 'click' when doing this.
5. Close the case and insert the HDMI micro lead, micro USB lead and power supply lead into case.
6. Connect a monitor (no need for a mouse or keyboard) to its respective lead on the Raspberry Pi Zero W and turn on the power supply.

You will see various jobs being done on the monitor, as shown on the next page.

```
* Detecting disk device: /dev/mmcblk0
* Creating data partition: done
* Formatting data partition: done
* Mounting data partition: done
* Creating required data files: done
* Setting empty root password: done
* Mounting filesystems: done
* Loading kernel modules: done
* Setting hostname: done
* Configuring CPU frequency: done
* Starting syslogd: done
* Starting throttle watcher: done
* Starting eudev: done
* Starting watchdog: done
* Starting rngd: done
* Starting wpa_supplicant: done (brcmfmac)
* Configuring wireless network: dhcp
* Setting current date using http: Thu Apr 2 13:09:16 UTC 2020
* Starting http date updater: done
* Starting crond: done
* Starting sshd: done
* Starting proftpd: done
* Starting smbd: done
* Starting nmbd: done
* Starting motioneye: done
# Interface wlan0 has IP address 192.168.0.112/24
# Default gateway is 192.168.0.1
# DNS server address is 192.168.0.1

Welcome to meye-86cc3251!

If you want to see a friendly user interface,
point your web browser to the IP address of this board.

meye-86cc3251 login:
```

Important points to note:
    Using wpa_supplicant.conf, not looking for an Ethernet connection
    The wlan0 IP address, no need to include the /24 (or whatever your computer shows)

Now that you've got this far you can disconnect the monitor (leave the Pi powered up though).

Go to another computer, load up a web browser and type in the IP address (minus the "/24" as shown against wlan0 above and press [RETURN].

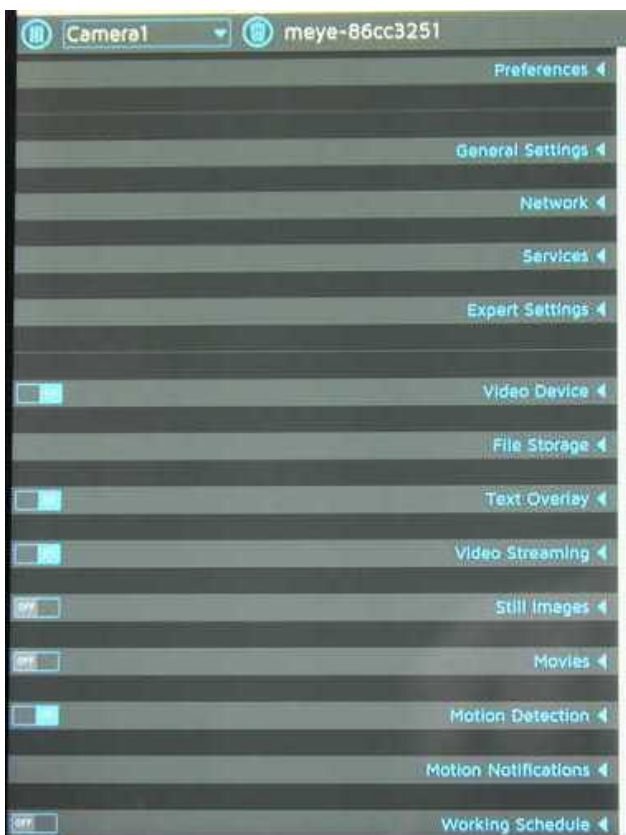Next I'll show you how to log in and basic setup instructions.
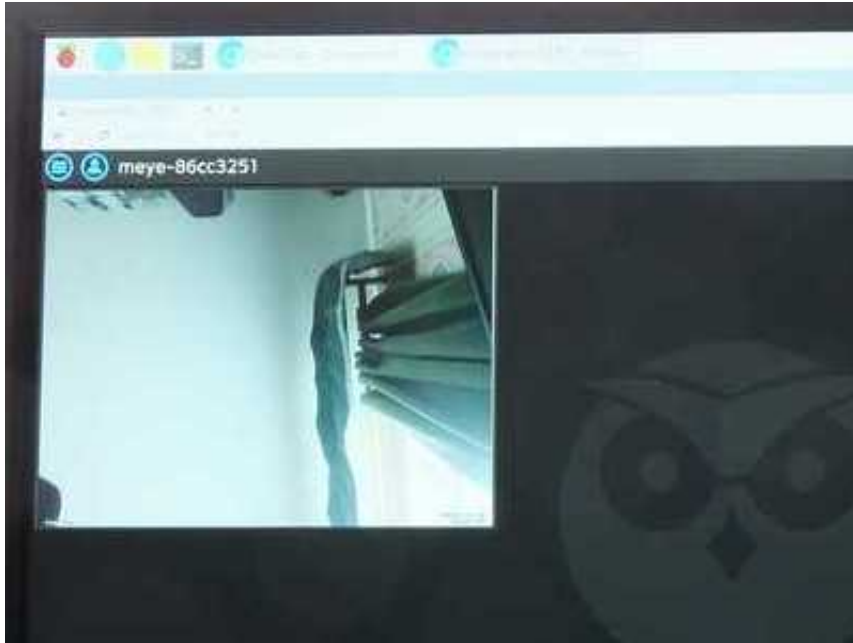
Here we see the first screen, you have not been asked to login as there is no password set, this we need to tackle now.

Note the IP address on the browser tab (192.168.0.112).
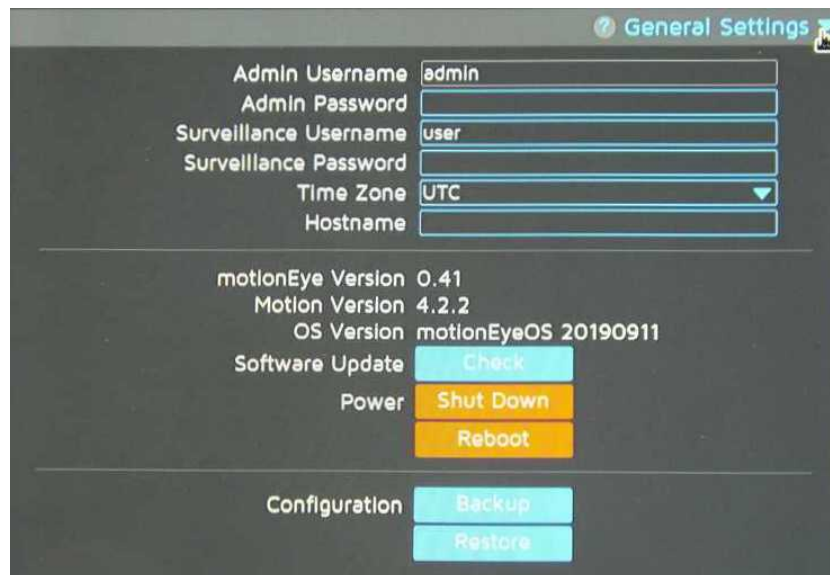
Click on the left blue circle icon.

Menu options are:

    Preferences
    General Settings
    Network
    Services
    Expert Settings
    Video Device
    File Storage
    Text Overlay
    Video Streaming
    Still Images
    Movies
    Motion Detection
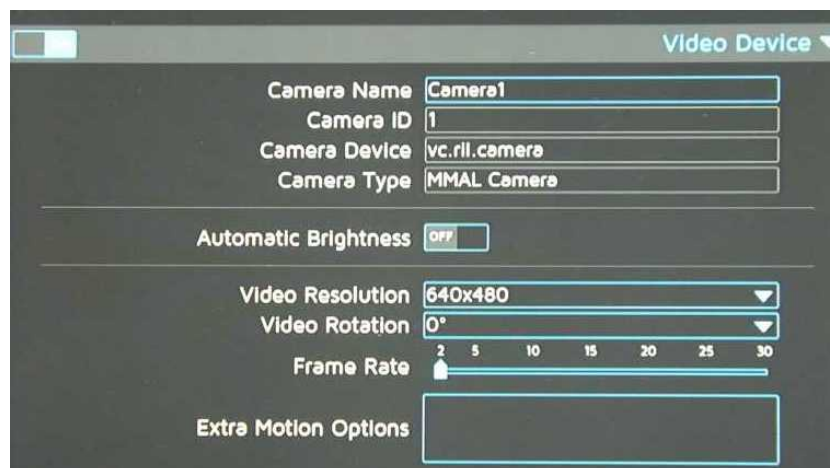   Motion Notifications
    Working Schedule

Plenty to get on with!

I'll talk you through a few settings to get you up and running.

Click on General Settings.

Enter a password for admin, also enter a password for user should you wish.

An orange box will appear at the top of the screen, click on this to save your changes.


Click on Video Device.

Click on the drop-down list in the video resolution field and select the resolution that suits you.

If you wish to change your storage location, click on File Storage, I chose to save to a USB flash drive, I inserted the FLASH drive into the USB lead, selected the device from the drop-down list and told it where to store the pictures inside the root folder.
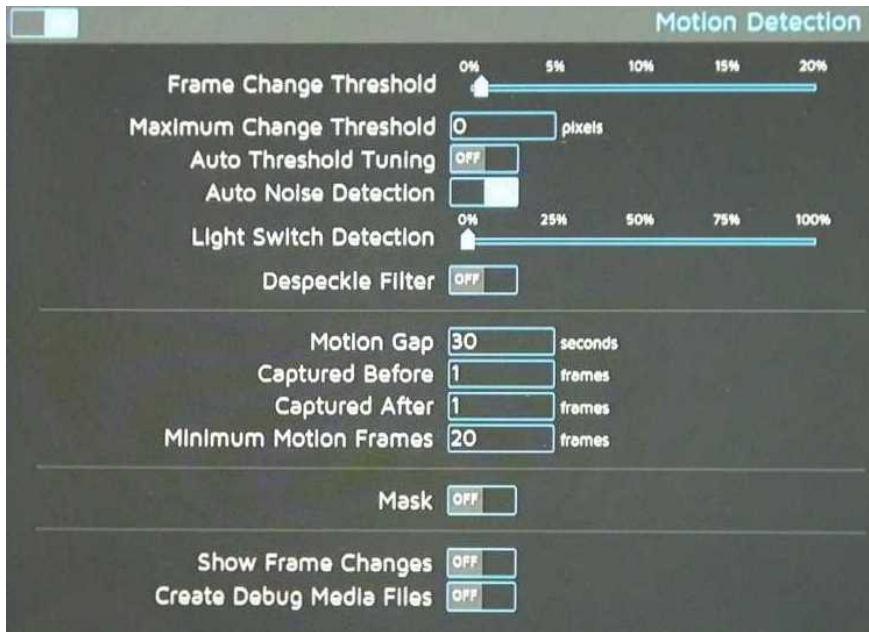
Click on Motion Detection

Run your mouse down the right-handside of the centre section, as you move the mouse you will see question marks (?), rest the mouse over any of these will cause an information window to appear giving information about that field, change any settings you may feel appropriate, experiment...

Close the Settings window by clicking on the blue circular icon at the top left.

Click on the image on the screen, you will get what the camera sees.

You are presented with 4 icons at the top right, the 1st icon puts the picture in full screen mode, the 2nd icon displays any photographs taken, here you will have the option to see each individual picture, download that picture, zip all the pictures and download them (if there are many pictures this can take a while), the 3rd icon deals with video's and the last icon puts you into settings mode, that's it, have fun!

Contesting

This month we have the 80m CC SSB, DATA and CW contests. Next month we have the same HF contests - I have included the National Field Day for completeness, hopefully we'll be able to do this, we also have VHF contests this month.

HF
May

Callsign	Day	Date (2020)	Time UTC	Contest Name
M0IHY	Mon	4 May.	1900-2030	80m CC SSB
M0IHY	Wed	13 May.	1900-2030	80m CC DATA
G3XZG	Thu	28 May.	1900-2030	80m CC CW

June

Callsign	Day	Date (2020)	Time UTC	Contest Name
M0IHY	Mon	1 Jun.	1900-2030	80m CC DATA
M0IHY	Sat-Sun	6-7 Jun.	1500-1500	NFD
G3XZG	Wed	10 Jun.	1900-2030	80m CC CW
M0IHY	Thu	25 Jun.	1900-2030	80m CC SSB

VHF
June

Callsign	Day	Date (2020)	Time UTC	Contest Name
M0IHY	Sat/Sun	20/21 Jun.	1400-1400	50MHz Trophy Contest (VHF Championship)
G3XZG	Sun	28 Jun.	0900-1200	50MHz Contest CW (VHF CW Championship)

Oops - again!

Not being content with having my fibreglass mast break once, it has happened again (same mast), this time over my other neighbours garden (the wind had changed direction!), now I've mounted it (albeit in a repaired state) in the middle of the garden, it's guyed at about 3 metres and at the very top, so far (fingers crossed) it seems to be holding up.

Unfortunately, although I defy any wind to blow it down now it's guyed "good and proper", it's not as good as it was on 80m when it was in the corner (I'm sure the aluminium tube used to repair the fibreglass mast had a lot to do with it), that's the problem with having a 'postage stamp' sized garden (6m * 6m for my shed and antenna's, Angie owns the rest!), so...

A month or so ago I ordered another 10m 'flag pole', this is now mounted slap bang in the middle of "my patch" with 19.6 metres of flexweave up to the top and towards the house in an inverted-L, this is accompanied by several counterpoises between 1 and 2 feet off the ground, it's guyed off 3 metres from the ground, about 7 metres up and the very top. Reports so far (daily net on 3.730MHz) show they seem to be able to hear me, I even had one of the Devon hams give me a signal report, low, but readable, there's hope for me yet!

Hopefully (fingers crossed) the mast will stay where it is!

Continuing on the theme of antenna's, I have replaced my trusty Diamond X50N (2m and 70cms) with a brand new Diamond V-2000, mounted at about 8m high, just above the roofline. I think I had the gremlins that day as my vertical tuned perfectly, my cobweb likewise, but would the V-2000 tune on 6m, would it heck. Up and down the ladder several times, removing the antenna and 4m pole each time and checking everything was okay, only to find out it was the rig having a senior moment, a quick reset and restore of the saved menu settings (held as a backup on my PC) bought things back to life, now the antenna tunes in at 1.4:1 (before using the rigs A.T.U.), all I have to do now is use it! The purpose of the V-2000 is to give me 6m capability without having to raise the pump-up mast (getting lazy in my old age!).

M0IHY

FT897D/SDRplay 1a Conversion

With all the best intentions, I have to report no further progress with the conversion. I placed an internet order with a watchmakers tools company for a couple of clip-on magnifying lense to enable me to see the solder points correctly (yes, they are that small), I'm still waiting for them to arrive by post

The supplier has contacted me apologising for missing my first email (my second suggested a refund if not contacted within 72 hours), they say it's possibly delayed due to the Coronavirus pandemic, eBay and Amazon seem to be coping well!

The good news is they've finally arrived!

Hopefully next month I'll be able to report back that it's done.

M0IHY

Any other business

Well done Guy!
Congratulations to Guy for passing his Foundation Licence exam on the 13th of April, his callsign is M7GUY (as Jeremy said, "how did he do that?"!).

Future Exams
Both Peter and Paul have their online exam date, the 15th of May, we wish them both the best of luck, I have complete faith in both of them, they're consistenly scoring more than required for a pass in all the tests I have set them.

Welcome
To Jules, or is it Joules (M0UGA) to the club.

Windmills On The Air
Unfortunately we've had to cancel this year, even if we are given the 'all clear' by the government we won't have enough time to organise things, however...

We're currently checking with the RSGB/Ofcom as to using the callsign but not from Brill, it's an idea, should be fun, the idea is to work from our own QTH's, using GB0BWM as the callsign and logging as many calls as we can. What we have to sort out is whether we can all operate at the same time (on seperate bands), or each have a time slot, I'm awaiting an answer from Ofcom and if no response has been forthcoming by the end of next week I'll ring them for confirmation.

Great news, we can go ahead with operating from home using more than one frequency at a time, a schedule needs creating with 'who' can do 'what' and at what 'time', hopefully it will be a very busy weekend with many contacts made. If you want to take part in the "stay at home" event please listen in on the Tring repeater (GB3TU) Wednesday night at 8pm, or 50.200MHz at 8:45pm.

Online Foundation Questions
I've spent my time developing an online version of mock exam papers for the Foundation Licence, you have the option of 5, 10, or Mock Exam number of questions. From there you are shown a screen with numbered buttons representing the questions plus an extra 2, "Check" and "More Q's". Selecting a question immediately turns the button yellow, this is an indicator to show you've visited that question (not necessarily answered it though). When you're done, simply click on "Check" and it will process your answers, any that have been answered incorrectly will be shown with the correct answer, you will also be given references where to look among the Foundation Licence Manual or other required documentation, this will, hopefully, aid you with your studies. I've now written the Intermediate questions program and have modelled it on the the Foundation questions program.

My thanks to https://www.hamtests.co.uk for the use of their question bank and Malcolm (G3ZNU) for the work he's done to include this on our clubs web site.

The programs can be accessed from http://www.g3mdg.org.uk/, and selecting the Training tab.

Any problems (thanks to Paul for the mention of miniscule graphics!) please contact me directly on bryanpage1@btinternet.com.