Welcome to the 2020 newsletter with the obvious sub title of “Covid-19 lockdown edition”.

How a year can change everything!

This time last year we were celebrating our 10th anniversary of the move to Lansdown. This year we find ourselves celebrating the NHS, those who have survived Covid19 and remembering those who sadly we lost to this terrible pandemic. Sadly 2020 will go into the history books for the wrong reasons.

The repeater group have had to follow the lockdown rules, just like everyone else in the UK. We have had to observing social distancing. Hand sanitation, face masks and all the other points from the relentless list of government directives.

Back in January before the Virus was even an item on the news radar we attended site carry out the routine new-year site maintenance and checks. On arrival to site we observed the wood rot to the lower left of the door frame (we were already aware of this) had degraded quicker than expected. This triggered the need to take action once the weather improved as a majority of the work had to be undertaken on the outside of the building.

Of course by the end of February it was looking like we were heading into our first national lockdown this meant visits to site had to be put on long term hold.

Thankfully our arsenal of remote tools meant we are able to monitor the equipment and react if anything goes wrong, needs to be shutdown, or simply requires a reboot. I am pleased to say the monitoring systems worked as designed, GB3BS, GB7BS and MB7VV performing as expected, providing repeater function to all the users who pressed the PTT.

We are also pleased that members of North Bristol ARC started to use both Tony’s (G4CJZ) repeater GB3AC as well as GB3BS for their weekly nets or simply keeping in touch with each other while their club is closed. I would like to take a moment to reiterate that although they are referred to as ’Club Nets’ they are actually open to all to join in and take part, member or not.

NBARC would also like to encourage newly licensed operators to take their first steps on some of the nets (We all had to start somewhere). You will not be judged! Friendly advice can prove most helpful. As previously stated, they wish to welcome members of other clubs to join in as we all want to break down the wall of isolation. Please pick up the microphone and get involved.

My heart felt thanks must go to all net organisers and controllers, on all our repeaters around Bristol and the South West (GB3AC, GB3BS, GB3WR and GB3ZB) for keeping the airwaves buzzing in this time of social restriction.

So down to business,

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GB3BS Technical Report by G4SDR

Well this is going to be a fairly short report as the Repeater has been working away without any issues, faults or down time.

Now that the infamous Controller crash problem has now been fixed, the past year has seen GB3BS be available 100% of the time with not a single crash or lock up.

Usually, each year, I load up the car with test equipment in order to give the Repeater a health check. This year, due to the Covid-19 situation this has been put off, probably until early 2021. I have however, carried out some basic off air checks and everything seems well and as previous years have shown, the GB3BS equipment is performing very well and needs virtually no attention.

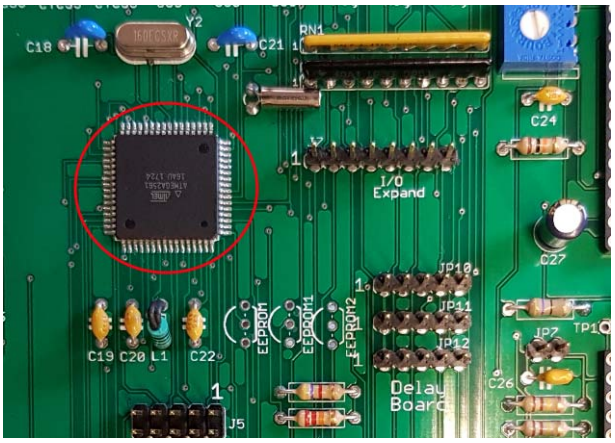
Operationally the Repeater has, as usual, been performing well. Unfortunately we have had the odd intrusion from, let's say, stations who should not be transmitting at all. And sadly, from others who simply should know better.

Bouts of the usual "Blipping" up the repeater for no reason has risen, probably because those that do it have more time on their hands. We have no issue with people who wish to genuinely check their equipment with GB3BS. But please remember to give your call sign, as your license requires.

RC210 Controller.

Currently the GB3BS Repeater controller is based on the Arcom RC210. We have been running this controller for over 12 years now. Over the last two years the manufacturer has updated the system by releases of new firmware.

However, the micro processor that it uses has become obsolete. So Arcom have taken to using a new and updated processor. Fortunately the new processor is pin compatible with the obsolete one, so there is no need to go out and buy new hardware & PCB's etc.



Mat – G7FBD undertook the job of un-welding the surface mount old processor from our standby unit and replaced it with the new processor which was purchased from Arcom with its boot loader pre programmed.

Following some testing by Mat to make sure everything was running as it should I put it on the test bench here to complete a slight hardware addition in the form of some extra E^2 memory.

The result of this processor & memory upgrade will allow it to be future proof, well as best it can be!

It also allows extra functions & facilities to be programmed in allowing us to better control the repeater and subtly change how the repeater operates under certain conditions.

Once all the hardware was changed and tested it was necessary to re-design the configuration files, these tell the controller how to perform, such as sending Voice, CW ID's and checking for valid accesses.

Some new routines have been added and we hope these will allow for better operation of the repeater. Allowing easier first time and subsequent accesses, better Timeout control, along with the ability to automatically change its responses and set its own parameters, if being abused for example.

After several months of testing and tweaking everything was in place to swap it out for the operational one on site. Then once swapped out we could update that one with a new processor.
Most of this should of by now taken place, but this was put off because of a GPS Clock problem. The GPS Module/Receiver that we used was made by Trimble, a well know manufacturer of GPS receivers. It came to our attention, mainly by accident, that these units had gone EOL (End of Life).
Although we had been aware that these Trimble units were EoL they still continued to function. However, it was noted that they had passed the final date whereby they would not correctly update if they succumbed to a Cold Boot or power cycle. So providing we did not power cycle the GPS Clock on site we would be ok (ish). We realised that this was not a good place to be in. After much talking, we decided it was Time for a complete GPS Clock redesign (see Mat's item *"When time stands still"*). So this would hold up things for the controller change over.

As things stand, as I write this, the new GPS Clock (as designed and built by Mat) has been installed at site and is keeping GB3BS's time synced faultlessly. What's more, this is another item that is now future proof.

The swapping over of GB3BS's controller has thus been put on hold once more until January next year. Hopefully by that time things will be a little clearer on any potential & further Covid-19 lockdown measure or restrictions. We will endeavor to keep people informed as best we can.

GB7BS Technical Report by G4SDR

Similarly, very little to report here as GB7BS has been on air for 100% of the time, without any down time whatsoever. However, there have been a few but brief outages of the Internet feed to it, as such, during those outages the connection to the South West Cluster Network was down.
The few outages that occurred were either a problem with the Internet provider, power outages at Mat's QTH or electrical wiring work, again at Mat's QTH.

As with GB3BS, maintenance this year was reduced to off air testing. A full maintenance check will be carried out in early 2021. But so far everything is stable and running as it should.

Currently there is one outstanding task for GB7BS and that is a potential Firmware upgrade that has been released by Motorola. But this is not critical and will be carried out following a maintenance check next year.

Aerial Combiner System.

Every year I spend time checking the Antenna combining system. As GB3BS & GB7BS use the same Antenna it is important that this combining equipment functions at maximum performance.

The combiner is used to split the antenna bandwidth into 4 different narrow frequency paths, each for GB3BS TX, GB3BS RX, GB7TX & GB7RX. Keeping the losses to a minimum and the isolation at a maximum can be a bit of a juggling match.

These devices do tend to mechanically drift over time due to temperature changes and stresses to their metals; although they are designed & manufactured with this in mind I find it good to keep a check on them, ensuring that all the cavities remain tuned to peak performance.
It should be remembered that the room temperature at our site can swing between 5C and 35C during the year. So far, once again, everything seems stable and operating at it should.

Site Maintenance.

In last years Newsletter we reported on just having some nice new twin doors installed. Well, during the year we have spent some time to ensure that they are protected and last us well into the future.

We managed to save a little money in the cost of the doors by doing all the sanding, priming and painting our selves. The doors were professionally fitted so all we had to do is protect them from the weather. The position of the doors are such that they seem to catch every bit of wind, rain and snow.

So, over several weekends, when the weather was good (in between lockdowns), we sanded the doors ready for applying a base coat primer. This was left to fully dry ready for the final top coat. The next weekend the first of two top coats were applied. It felt like home decorating all over again!

We managed to get hold of some really good outdoor grade paint which dries to form an almost plastic like covering which is supposed to be impervious to sun, high temperatures and rain/moisture & with anti-mould protection.

So after another full weekend the second & final top coat was applied, just in time as the threatening rain showers moved in. Fortunately the stuff was quick drying so things worked out well.

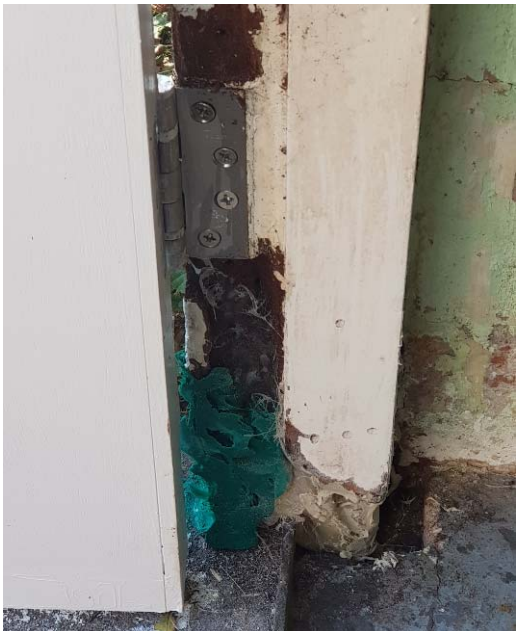
The only thing left to do is fit some door brushes. These will be fitted along the bottoms of the doors to help prevent leaves and tree debris etc being blown under the bottoms of the doors, where it gets trapped and retains moisture, increasing the potential for rotting the doors again. This we found out is what, over many years, caused the wood rot in the old doors. Fitting of these brushes should help stop this happening to our nice new doors.

Our attention then turned to the bottoms of the door frame. Although it turned out that they are made from sturdy hardwood and are perfectly solid, there are signs of rot.

After chipping out all the rot, we applied “Rot Stop” to the open and bare wood. This is supposed to stabilise and seal the wood. On inspection we found that due to probably a small building error the door frame was set in a small dip in the foundations and this is where water would collect and over time rot the bottom of the frame.

Gosh, this newsletter is sounding more like a building DIY Manual ☺

Anyway, once all this was cleared out and stabilised, we filled in the missing bits with epoxy resin material. This would make it water proof again and would not rot! The pictures show some of the stages of repair (it looks worse than it is). Once fully sanded and painted it should look like new.



Roof Work.

When we moved to our Lansdown site, some 11 years ago now, one of the first jobs was to repair the leaking roof of the Generator room. Fortunately we managed to get professional help and a new roof covering was installed across the whole of the building.

The new roof covering was finished off with a reflective Aluminum Paint to reduce heat absorption from the sun. This protective covering is recommended to be redone roughly every 5 years or so. So it was well overdue for re-painting.. oh boy, more DIY!

Another weekend was arranged when the weather was going to be kind to us. Early in September we spent the Saturday up on the roof clearing off all the old leaves, moss & tree debris.

Finally I could see what the condition of the roof was like, and I was pleased to find that apart it needing a re-paint, it was in very good shape. We then gave the roof a good sweeping and it was ready for its new coat of paint.

I then turned to the two drains which are prefabricated into the roof. They drain away all the rainwater down a pipe and into a soak away. The drain gratings that are there to trap any muck and dirt don't do a great job and I noticed that one of the drains was not draining away and was still full of water!

It became apparent that the pipe leading to the soak away was full up and blocked. Looks like it needs a pull through or a good "roding" I thought! After uncovering the soak away at ground level the pipe was definitely fully blocked. So after a brew-up we found an off cut of some Heliax Co-Ax that would do just the job for roding out the pipe.

Back up on the roof and pushing the Co-Ax down into the drain, it had not gone far when resistance was felt, oh dear; this is not going to work. After pouring some water in and continuing to poke the blockage in the pipe, there was this sudden freeing of the blockage followed by the satisfying gurgling sound of a drain finally emptying. A quick pouring of fresh water down the drain proved that the pipe was clear again, phew!

Sunday arrived and the weather was good. The roof was clean and dry ready for repainting with this reflective Aluminum paint. With the tin of paint opened Mat got to work with the electric drill and paint mixer attachment. After some 20mins of stirring this stuff didn't look at all like Aluminum or even silvery. It was Bronze in colour with odd flecks of silver floating about.

Oh well, up the ladder & out with the paint roller, I was soon on the roof again applying this paint, remembering not to paint myself into a corner, or at least where the ladder was!

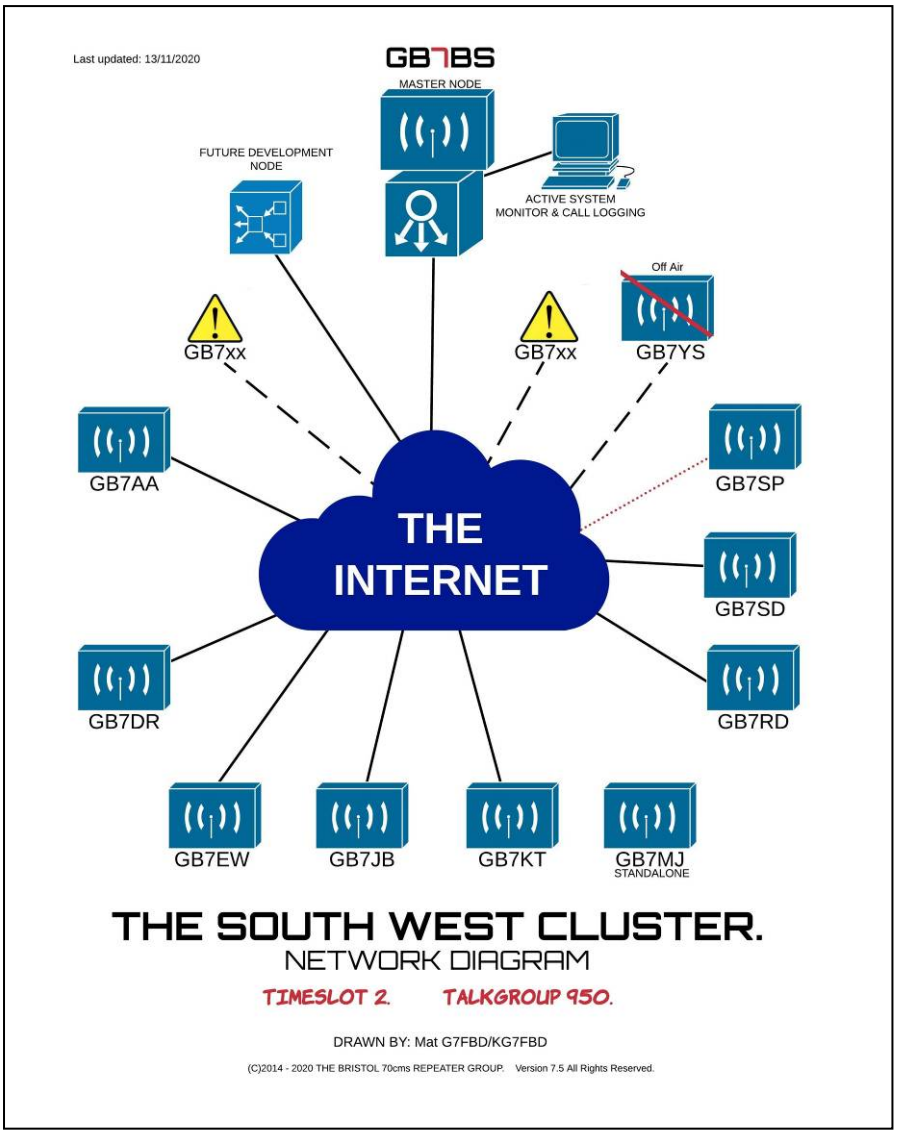
The paint was going on quicker that I though it would and after about 10 min what I had already painted was slowly drying and turning from the Bronze colour into what it said on the Tin, a silver, highly reflective finish.

Full drying time between coats (2 were needed) was 3 days. The second coat was applied the following weekend and although I say so myself, a good job was done. Shame it will soon get covered in leaves and moss again!

So this about covers all the maintenance work carried out this year. There are still a few outstanding bits to be done but these will be finished as and when we can, weather and Covid-19 lockdowns permitting.

South West Cluster Network.

2020 has been a busy year for the South West Cluster. We have seen two new repeaters join the network and one that has decided to leave. Below is the current Network as it stands, or planned as of today.



Firstly the new repeaters who have, or who are about to join the SWC.

GB7RD – Located near Yelverton IO70XL on DVU55.

GB7EW – Located at Exeter IO80FR on DVU42.

A warm welcome to them and we look forward to working with the two groups and to hopefully increase overall activity.

Unfortunately we say goodbye to GB7ED located in Exeter. Although this may have been a clash with GB7EW the keeper felt that as GB7EW was located at a more advantageous site so he decided not to connect to the SWC.

It is my understanding that the repeater GB7ED remains active in standalone.

During GB7ED's time on the SWC we were continually getting reports that no stations were heard using it or coming in to work the SWC. A quick check with our logger seemed to support this.

In fact we could not find a single station that had used it. Reports also said that it had very poor coverage and was difficult to access, although we cannot support those claims, it did feel that something was not right with it.

We hope that with both GB7EW & GB7RD it will stimulate much needed activity. Pushing further down into the South West will hopefully pick up pockets of users. I know that both of the repeater keepers/groups are keen for this to happen and would be good to see, especially after all the hard work they have all put in.

The Repeater GB7YS which was located in Yeovil is still off air after loosing its site over a year ago now. Currently there is no news on any prospective new site. But I do know that the keeper, Dave G3ZXX, is working on this, so hopefully some news in the future. GB7YS was a great Repeater and had really good coverage. It has left a hole in the SWC coverage, so fingers crossed for a new site.

As you can see from our Network diagram, the Internet plays a vital role. Without it the SWC Network would not work.

Throughout 2020 we have seen a rise in the number of times various Repeaters have been absent from the SWC due to their Internet feed becoming disconnected for a variety of issues and genuine faults by ISP's. The vast majority of this has been 3rd party problems and not the Repeater groups fault.

As this goes to print there are two Repeaters that are currently in Standalone Mode. These are GB7KT and GB7SD. In the case of GB7KT the keeper has since found out that the site owner is undergoing an IT infrastructure change and/or rebuild. As soon as this work has been completed it is hoped that the Internet feed will be restored.

Time scales for this are currently not know as there maybe delays due to the Covid-19 situation.

GB7SD has also a problem with its Internet feed. I have been informed by the keeper that the 2 hop microwave link between the Repeater site and Internet connection site has a problem and is being investigated by the 3rd party.

Once again time scales to a fix are unclear due to.. yes, you guessed it, the Covid-19 situation.

I do know that both repeaters remain operational but disconnected from the SWC. But, you never know, by the time you read this one or both could be back on! Check our Face book Group page for up-to-date Repeater status.

So, hopefully once Internet feeds are restored and the network is back to normal we can look forward to some extra activity from the new repeaters.

Finally, the life of a Repeater has certainly changed over the last few years, and this goes for both Analogue & Digital. Repeaters these days seem to cater more for fixed stations rather than mobiles. Which is strange when you think about it as Repeaters were originally put in place to extend mobile and portable ranges.

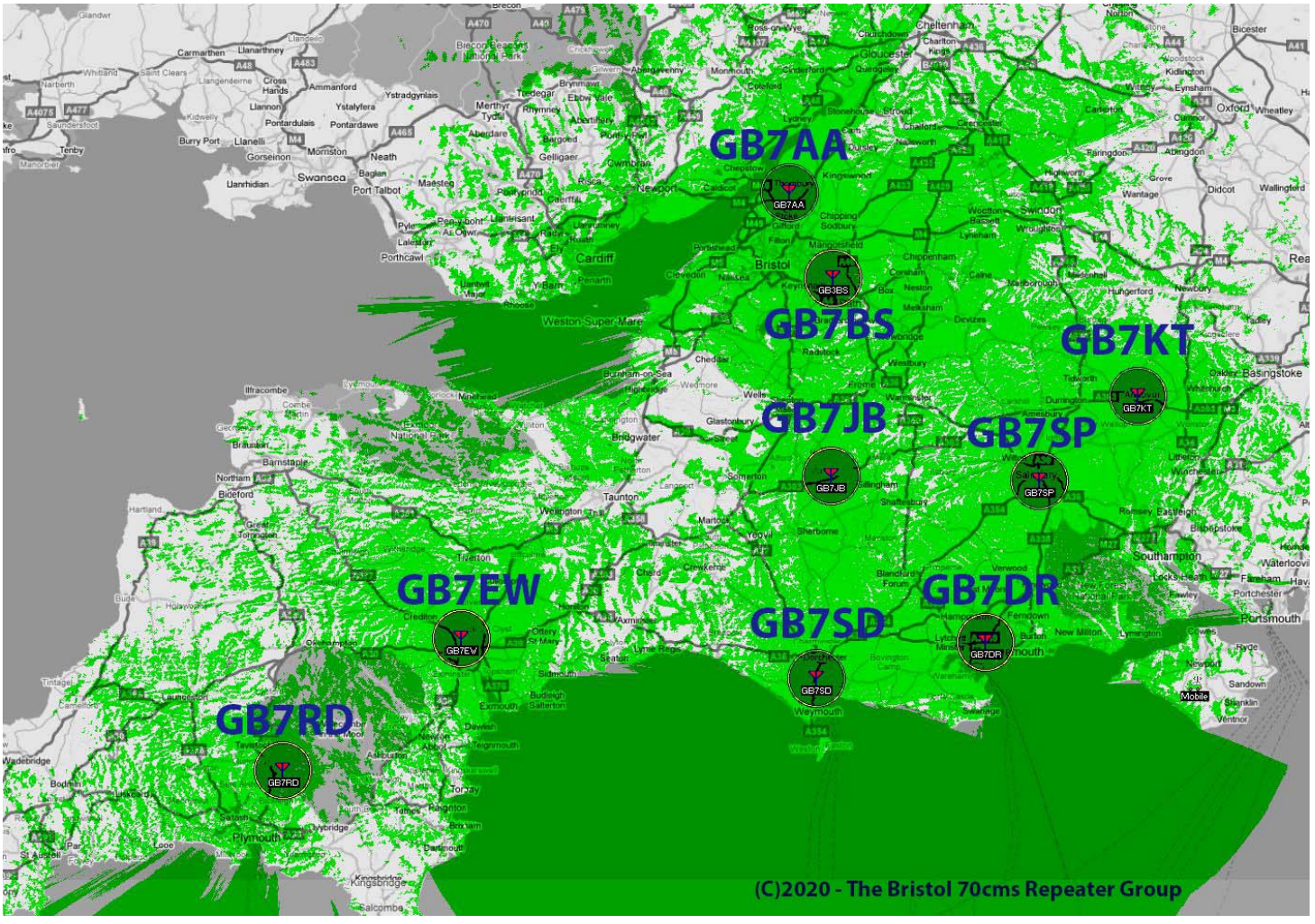
Newcomers to the South West Cluster should be aware that the network was designed primarily for both Mobile & Portable use in mind as it allows for Full Roaming between Repeaters, which is ideal for mobile operation.

South West Cluster Repeater List

Repeater	Location	QRA	Channel	Output Freq	Input Freq	Colour Code	Notes
GB7AA	Thornbury, Bristol	IO81RO	DVU54	439.6750	430.6750	1	
GB7BS	Bristol/Bath	IO81TK	DVU13	439.1625	430.1625	3	
GB7DR	Poole	IO90AR	DVU34	439.4250	430.4250	5	
GB7EW	Exeter	IO80FR	DVU42	439.5250	430.5250	3	
GB7JB	Wincanton	IO81TB	DVU37	439.4625	430.4625	1	
GB7KT	Andover	IO91GE	DVU40	439.5000	430.5000	1	
GB7RD	Yelverton	IO70XL	DVU55	439.6875	430.6875	3	
GB7SD	Weymouth	IO80SQ	DVU33	439.4125	430.4125	1	
GB7SP	Salisbury	IO91CB	DVU60	439.7500	430.7500	3	
GB7YS	Yeovil	IO80QW	DVU57	439.7125	430.7125	1	Off Air. Pending Site Move.

Talk Group List: **TG9 - Slot 1 Local**
TG950 - Slot 2 SWC

Information Correct as of December 2020



South West Cluster coverage map. December 2020.

Using the South West Cluster.

This is probably an opportune moment to clarify a few operational do's and don'ts. Observing these points will help you to get your rig programmed, operating properly and assist in keeping the SWC network operable to everyone.

- Please make sure that your rig is correctly programmed with the right frequency shifts & splits, colour codes and that it observes the correct Admit Criteria, this is most important when working through a Repeater and should be set up as Color Code Free.

- If your rig is equipped with GPS it is imperative that on channels used by the South West Cluster Repeater Network that this is turned OFF at all times and preferably should be programmed such that it cannot be accidentally or inadvertently turned on. The SWC Network does not support GPS in any way.

- Make sure you only operate on the right Talk Group & Time Slot, otherwise other stations will not hear you. On SWC Repeaters use Talk Group 9 on Slot 1 for local QSO's and Talk Group 950 on Slot 2 for the SWC Network.

  Wait for the Talk Group to close between over's. This is usually indicated in several ways, usually by an audio tone (Rig Generated) and a Signal LED changing colour or flashing differently. This will vary with different rigs so it's good to read the manual.

- Tx Timeouts are set for 4 mins, after which the Repeater will drop its throughput. Again, depending on your rig and its programming it will alert you that you have entered Timeout and suddenly find you're in receive mode even though your finger is still on the PTT.

- One thing that should NOT be used is what they call Point to Point calls (PTP), also known as Private Calls. This is where you call a single user, using his personal DMR ID. While a PTP call is in operation the Repeater will **not** be available to all other users who wish to use it. This is the same for both Slots 1 & 2. Stations that persistently make such Private calls on the SWC Network maybe temporarily inhibited from using the system.

- Calls using the Emergency function should never be used. Again, like GPS, this function should always be turned OFF on any channels used by the SWC, preferably by disabling the function when programming it. Emergency calls do not go anywhere; it cannot and must NOT be used to summon Emergency help like that offered by the traditional 999 service.

  If an Emergency call is somehow activated on the system then this will show up on anyone monitoring the Talk Group as an Emergency Call. If this does happens, it can be cleared automatically by all stations refraining from transmitting for 15 seconds and letting the Talk Group close.

- Finally, the use of sending Text messages between stations is ok as it does not impede on the general operation of the Repeater(s).

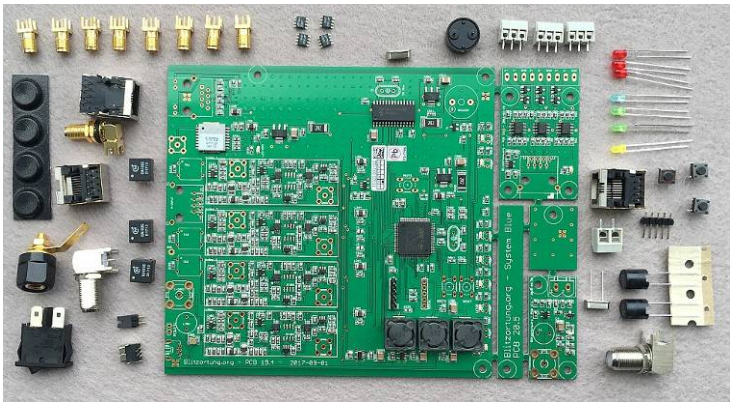
Blitzortung – (Lightening Detection) Project.

Readers out there may have already heard of this system, it's been about for a while and has been an interest of mine for a long time… The detection of Lightening from monitoring VLF frequencies.

The subject is a complicated one, and the math's behind it. I profess that I am no expert on the matter, but it's something new. Some may even say that it's nothing to do with Repeaters or Amateur Radio, what's it doing here?

Over two years ago, it must have been, Mat and I were discussing these Lightening detector systems while looking on their website Blitzortung.org. They operate a worldwide network of such detectors of varying revisions. At that time there was talk of a new design being produced, so we indicated our interest at obtaining and building one of these kits. Time ticked by and we heard nothing until around June of this year.

We were informed that Kits were now available from Blitzortung.org. Both Mat & I thought that it would be interesting and fun to install one at the Lansdown Repeater site as we had everything there to allow it to run 24/7 365 days of the year. So I decided to purchase a kit at my own personal expense and donate it to the Repeater Group, so absolutely no Repeater Group funds have been used.



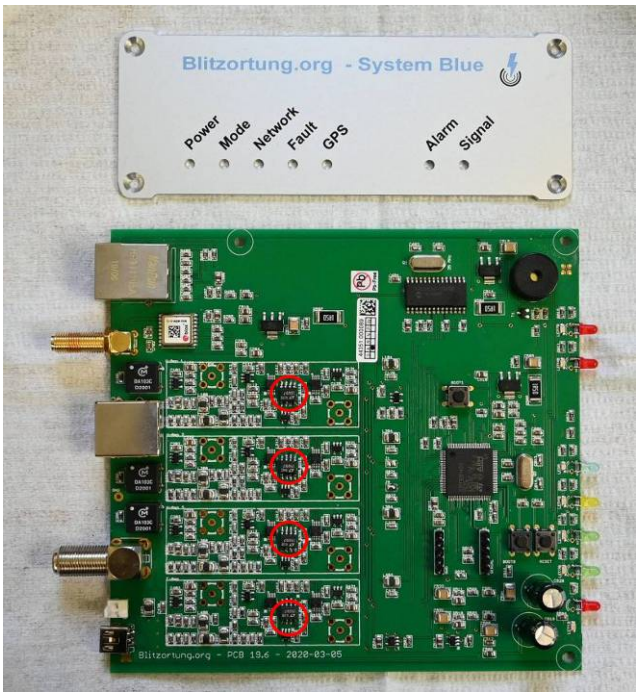
The kit arrived at Mats QTH and he got to put the main box of tricks together, as he is the expert when it comes to welding down surface mount components and was something to keep him busy during the Covid-19 lockdown (part I).

Moving forward and when we were finally able to get on site we began installing the Antenna system for the detector. The Antennas consisted of a pair of Ferrite Rods mounted horizontally and at 90 degrees to each other,. complete with pre-amp located in the Antenna housing. This is the "H" Plane Antenna.
A second Antenna was also installed and consisted of a 300mm vertical rod and with its own pre-amp. This is the "E" Plane Antenna. A GPS Antenna was also needed to provide an accurate timing source used to calculate the detected lightening strikes and their Time of Arrival.

All the cables were run into the radio room on site and connected up to the main box. The unit essentially contains 4 VLF receivers, which cover DC to 250 KHz, a GPS Receiver and a Web interface. An internet connection was also needed so as to communicate with the rest of the Blitzortung monitoring network.

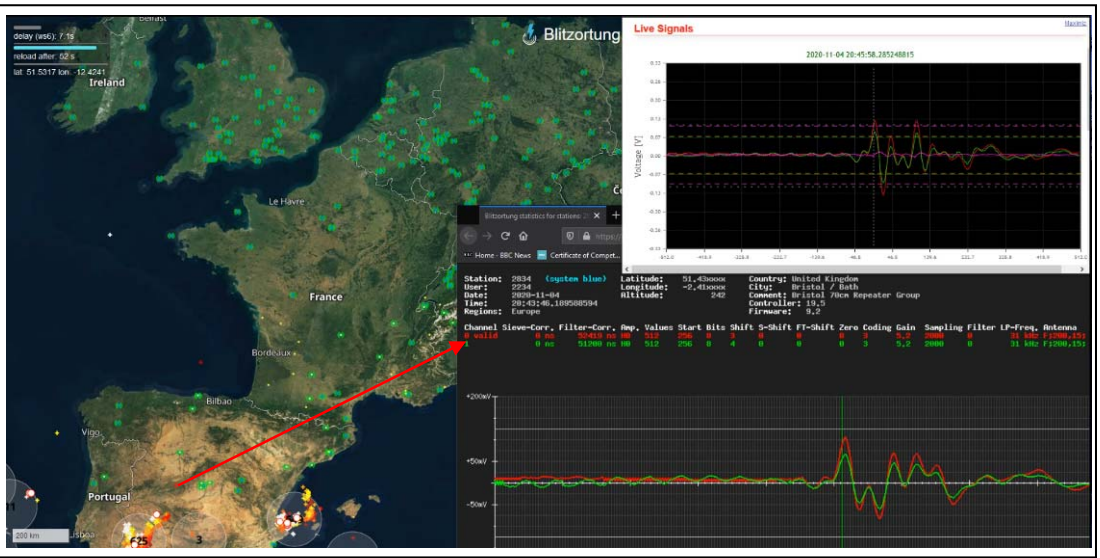
Some careful tuning and tweaking of the system was needed. Fortunately we could do all of this remotely, saving us time being on site.

One issue we had found was that on site, somewhere, there was something giving off a 42 KHz signal. Although this did not cause a great problem we did manage to reduce this by changing the orientation of the "H" Plane Antennas and adjusting the gain of the amplifiers.

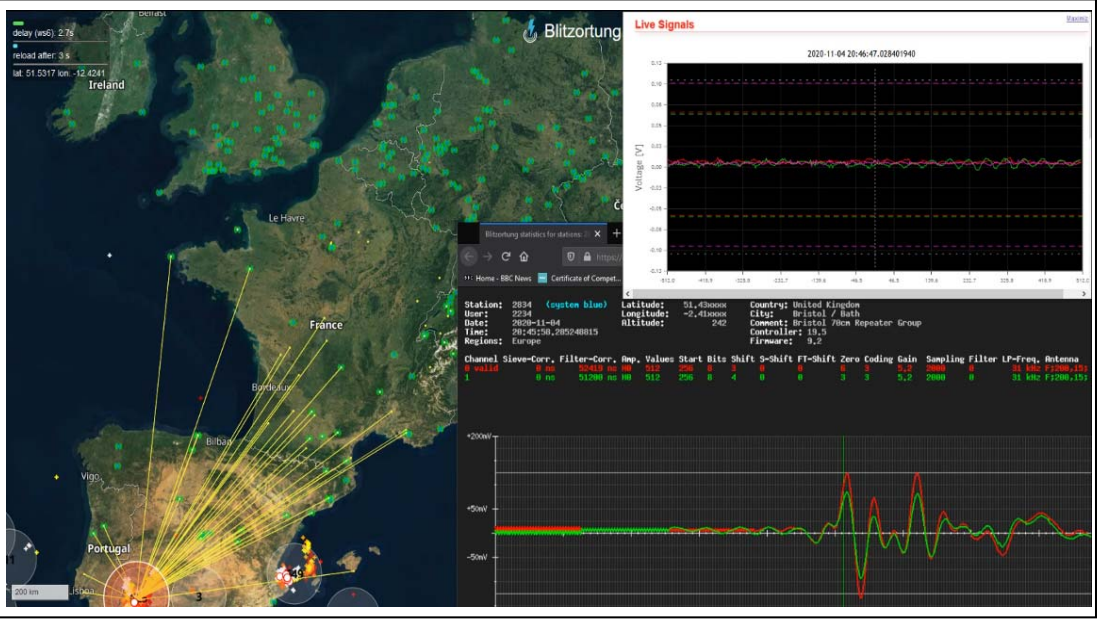


The receivers also have the facility to add optional Filters so as to further reduce unwanted VLF noise. We decided to purchase these Filters which come as small 8 pin surface mount IC's.

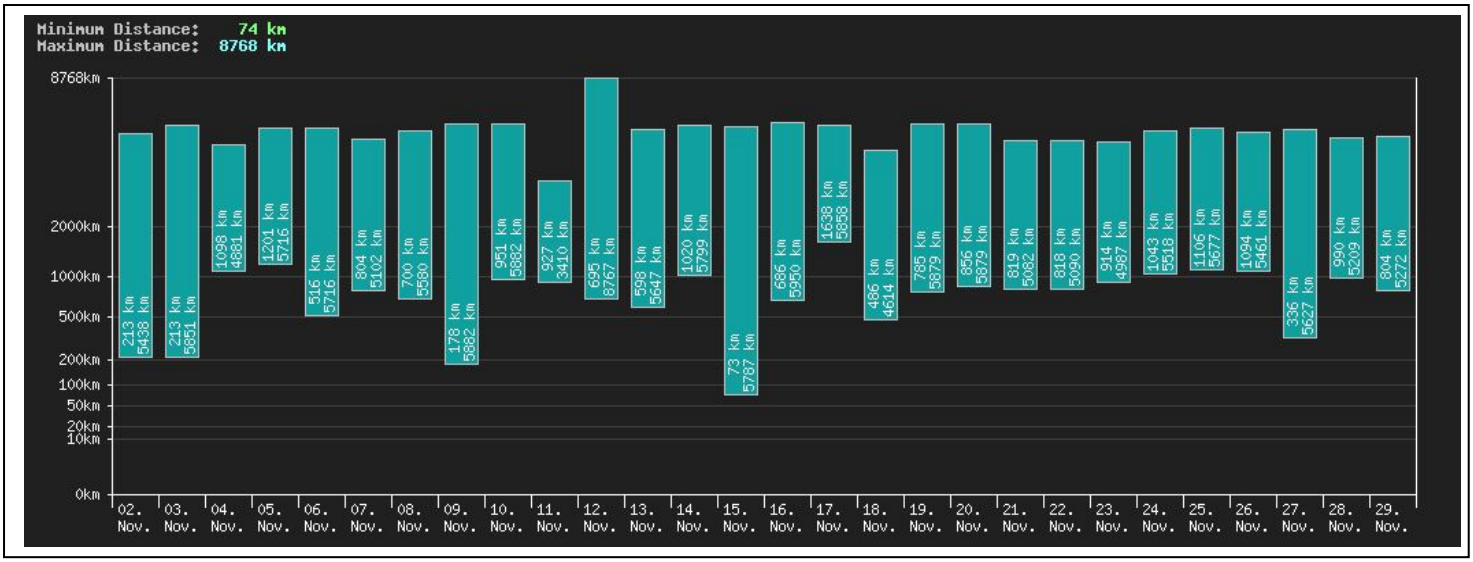
A trip to site and the Filters were successfully installed (Circled in RED) , followed by a bit more Antenna adjustment. We decided to set the Filter tuning to block anything above 35 kHz. Apparently the electromagnetic spectrum of Lightening discharges peaks between 3 & 30 kHz. Looking at the VLF Receivers output they indeed were working fine; our 42 kHz signal was gone. Now we were only detecting valid lightening strikes (Or Strokes as they are referred to).
The systems box is a cleaver unit. It has the ability to decide if a signal it's received is a real lightening strike or not. If it is a valid signal, it is then passed to the Blitzortung server where more mathematic computations are made. Then it decides if the data is to be used in triangulating the location of the strike/storm.



IF you look at the top right trace, this shows the moment a lighting strike (Stroke) is detected by our detector station, The trace below shows that the strike was actually detected by both H plane antenna's, but the strike detected by antenna 1 (N/S oriented) was evaluated as being the true "Valid" signal (Its hard to see the arrow points to the word valid).



The same strike is detected by a number of stations. Triangulation is imposed and the position of the strike is calculated and uploaded to the active webpage. This "Processing" takes a finite time hence the delay between detection and display. Around 1 – 2 seconds worst case.
In this example the screenshot was taken a fraction of a second before the yellow lines extended into a number of stations in the UK including our own.



Since installing this unit it is amazing to see and appreciate how much Lightening activity there is going on, not just locally but around the world and at any time.

Currently we are detecting Lightening storms some 10,000 km (6,000 miles) away, and those that are a lot lot closer.

As there is a lot of information on the Blitzortung and LighteningMaps web sites about this system, its output and how it all works, I am not going to duplicate it here.

So, if you are at all interested in finding out more, or just want to see and view the output in real time of our station, then some of the links below will be of help to you. We hope that you find it of interest.

Blitzortung.org main web site (a good starting point): **http://www.blitzortung.org/**

Blitzortung Live Vector map (Zoom & Clickable): **https://map.blitzortung.org/#4.32/53.13/0.93** from here you can click on our station, which is number **2834**, for a much more detailed view.

Detailed output of our station (2834): **https://tinyurl.com/y47ykbnm**

Lightening Maps main site: **https://www.lightningmaps.org**

Station 2834 detailed live view and full stats: **https://tinyurl.com/y3nbpblq**

Finally, if you have any questions or can't find something then get in touch with us and we will do our best to help.

Rally Report.

Sadly due to the pandemic and lockdown there have been no rallies this year. We hope to return to the Cheese and Grain at Frome for the West rally in 2021!

When time stands still.

Right back at the start of what we now call Lockdown 1 I was contacted via the GB3BS website by the keeper of a repeater (GB3EG) in Wigan.
He wanted to purchase an identical G.P.S.CLOCK that I designed for our own repeater GB3BS.

The time source that was currently on our Lansdown site was the second generation of the G.P.S.CLOCK and a design that is now over 10 years old. About six years ago I spent some time and personal money to redesign the hardware. This redesign moved from the traditional "Through Hole" design to using surface mount components allowing me to reduce both the physical size and power consumption thanks to a redesign of the PSU.
I produced a limited number of this the 3rd generation of G.P.S.CLOCK to test the water so to speak, and of course this was a total flop!

The Mark I G.P.S.CLOCK (2008)

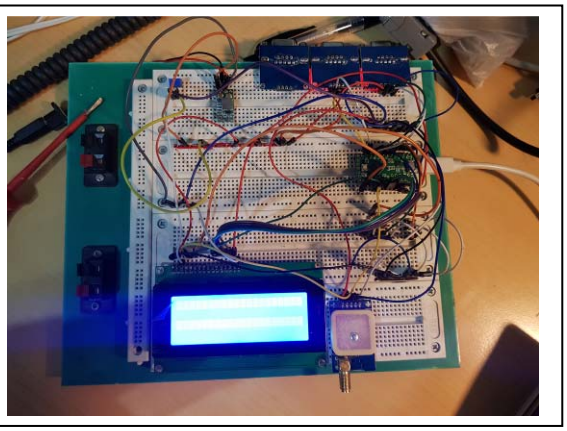
The Mark II G.P.S.CLOCK 2011

The Mark III G.P.S.CLOCK (2013)

By 2015 I was done with the G.P.S.CLOCK, other than a few bug fixes that are listed in other previous newsletters, the project and product was shelved. This was until April this year when I received that request. Having explained that I no longer produced the G.P.S.CLOCK Steve, the keeper pleaded for any parts I had laying around that could be pressed into building a time source.

I did have a couple of spare PCB's (I always hold on to at least one PCB I design and add it to the growing collection as a record of work) but the price of the micro I had used in the design had now become silly money. Even on the un-official markets in the far-east they were at least 70% more than the original price due to the chip about to go end of life.

As we were now in lockdown and I was working from home (and still working from home to this day), as a stress relief I start to explore porting my program which is coded in C++ to an Arduino family micro. I also wanted to take this opportunity to move from hardware dip switches to select time modes, such as daylight saving and UTC offset. To a fully software configured system. I also wanted to support the new CPU design that Arcom were wanting Repeater Keepers to move across to, while supporting the older CPU design such as in use on GB3EG.



Within about two weeks I had an operational prototype on a breadboard. It was connected via a serial to Ethernet converter to our spare repeater controller that was located in Mark's shack! Yes, I had the G.P.S.CLOCK here in my shack, talking across the internet to a controller located the other side of Bristol.

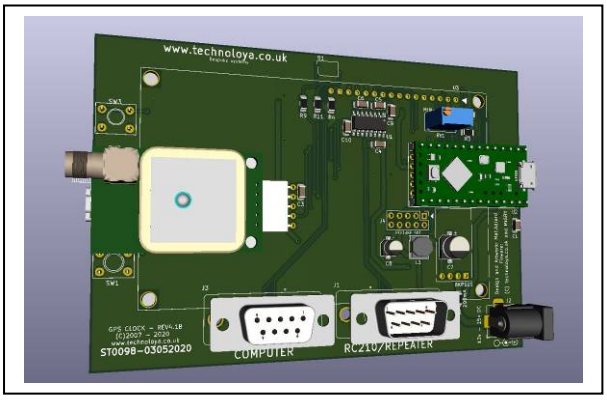
Lantronix USD1100 Serial to Ethernet adaptor.

Everything looked fine. The test repeater was beaconing in sympathy with the live GB3BS. All time announcements were in perfect sync. Then one evening, or rather morning, Mark caught the Date announcement that is transmitted at 1 minute passed midnight every morning. GB3BS reported the date correctly. However our test bench unit was reporting the wrong day/date. The following day I started looking at my code, I could see on the G.P.S.CLOCK display that the date was wrong! Instead of it being 2020 it was reporting it was 2000. (Remember all the fuss over Y2K ?)
I then spent almost a day pouring over my code looking for a bug. It was then I checked the data stream coming from the GPS Module and found it was indeed reporting a date of January 2nd 2000.

I re-programmed the Trimble to check that there wasn't an issue with the modules flash memory, yet it still reported it was 2000. I randomly selected another of my stock of modules and programmed it. Again it reported 2000.
I asked Mark to test a random selection of his stock of Trimble boards. Again, same result – January 2nd 2000. Obviously the firmware on the Trimble Ace III had overflowed its date register and rolled back to a date of 2000. Why it had rolled over mid April I am not sure, but roll over they had! This instantly made the Trimble obsolete as far as the G.P.S.CLOCK project was concerned. Thoughts instantly turned to GB3BS. Its clock was also running a Trimble ACE III GPS Receiver yet it was still reporting the correct date and time.
What were we going to do if the site, for what ever reason, lost power and the clock reset. Could it succumb to this year 2000 date issue? Or was it on a different firmware release and would fail at any point or could it just continue to run normally going forward?

I had to find an alternative GPS Module that were at a fair price, produced the NMEA protocol, and were still in production. Having spent a few days internet surfing I had found a number of projects that were using a UBLOX GPS module [*pictured to the right of the bright blue display shown above*]. More research on UBLOX un-earthed a number of GPS Modules they produced. The nice thing is that across their whole range they use the same programming software, terms, settings and protocols. I purchased a couple of modules which arrived via airmail from Switzerland within 3 days of ordering.

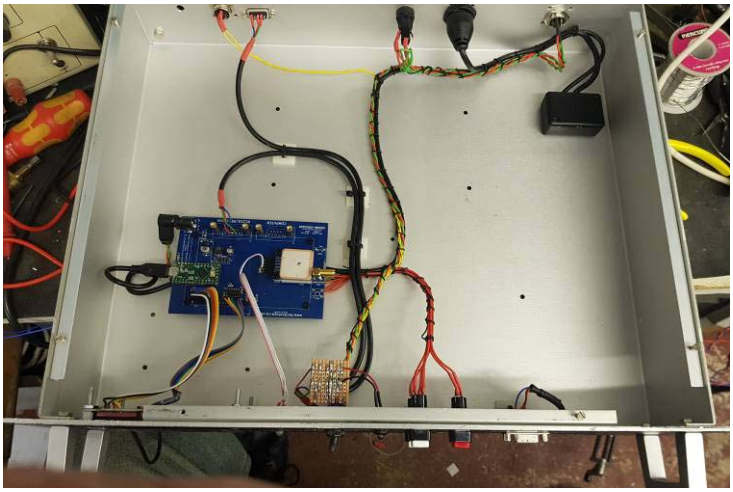
As the module spoke NMEA I was able to just plug it in and it kind of started to work. The only code I had to modify was my own program so that it ignored the other 7 NMEA sentences that I was not interested in. Unfortunately the modules I had bought did not have on-board EEProm so although I could program the module to not transmit these extra seven sentenced I could not save the settings so when the modules were power cycled they revered back to sending these extra 7 sentences.



Code finished and GPS module working I set up 4 weeks of testing. During this time I was contacted by the keeper of GB3EG asking for updates, so no pressure. I also re-designed the PCB to accept the new CPU. The CPU was changed from an Arduino to a Teensy which gave me three hardware UARTS and a lot more memory compared to the Arduino. Again porting the code to the new CPU was very simple, it was C++ and both processors used the same IDE (Integrated Development Environment).

I also reached out to a company and had some boxes laser cut ready for when the PCB's came back.

In late July I shipped a G.P.S.CLOCK to GB3EG and was surprised by its reception. The keeper left comments on the Arcom website about the G.P.S.Clock along with my details. Within two weeks I had sold all but one of the units I had assemble from the first batch and had already order a repeat production of PCB's to fill outstanding requests for this "Reliable Time Source" as it had been title by Shaun from GB3EG.



As previously stated I keep a PCB back to add to a portfolio. I also generally keep at least one assembled unit for testing/development in this case I kept 2 back.

The second unit was modified and removed from its plastic case (Not that it had been physically fitted into a case!). The modifications made allowed me to simply remove the Mark II G.P.S.CLOCK that GB3BS had been using from its rack mount case and simply drop the new G.P.S.CLOCK unit in its place. Three buttons were added to allow access to the new "software menu" system. The case was brought back to my home where the metalwork adjustments were made. Once complete the unit was returned to site at the first opportunity after lockdown 1 came to an end.

Thankfully 90% of the code currently running can be traced back to the very first G.P.S.CLOCK that was attached to GB3BS when we moved over to the RC210 repeater controller in the mid 90's, so its been well proven. The other 10% of the code was poked and prodded by both Mark here in Bristol and M1GRY in Cambridge (he was my bind tester) I shipped a clock to Gary with instructions on what I wanted it configuring as, but no instructions on how to actually do this or how to connect the clock up in the first place. As a result of this testing a single spelling mistake was spotted!

Technoloya
Bespoke systems

As a result of my adventures with the G.P.S.CLOCK and the interest shown, especially from the USA I have taken the first tiny steps to setting up a small business. It's currently a very tiny business, but it is early days.

I am using my time (When not writing newsletters) to develop other hardware project, some are Amateur based. I hope to get at least some of my ideas into production during the early quarter of next year.

MB7VV and MB7UVV (APRS).

As mentioned in my welcome section both APRS nodes have been working well with 99.98% uptime from both units. (I did reboot both at the start of November as I am aware of a bug in the firmware than can cause random crashing once the up time goes past 365 days.

I have applied for a variation on the NOV for MB7VV to allow it to move from an RF > INTERNET only gateway to a full blown bi-directional gateway.

A little background to this, back in 2014 (yes that long ago) at the RSGB convention I got to spend some time and a coffee with the Amateur radio department head of Ofcom. He had always been interested by our remote control solutions ever since we put in place the remote shutdown of GB3BS at Cossham Hospital.

I outlined my plans to install an APRS node at Lansdown and the restrictions of only being able to pass traffic from RF to the internet but not vice versa. I also informed him of our remote control facilities already on site at Lansdown. This interested him a lot. He asked me to submit a plan/request in writing detailing the remote control systems we have/had in place to demonstrate using remote control tools we could remotely control equipment to allow us to fully comply to the terms of our licences. He went on to say that Ofcom were a little behind on technology advances and remote operations and really wanted to move forward and learn what was possible.

Work life and its upheavals of redundancy, job seeking etc in 2015 did put this on the back burner. And sadly my “Ofcom contact” moved on from that role.
The Job I did land sadly only lasted just over 3 years and I was then back looking for and securing yet another new job.

At the end of 2018 I managed to submit a paper to Ofcom as I had been requested and was sent a reference number and was told the paper would be passed to the technical team for review and they would be in contact. By summer of 2019 not hearing anything I re-submitted the paper, exactly the same automated reply.

The start of September this year I called Ofcom and quoted both reference numbers from my previous submissions after a few minutes I was transferred to another department within the walls of Ofcom (Actually the lady I spoke to was working from home). She could not find any references that I gave, apparently this maybe down to the old classic “Software changes” made over Christmas 2019. She asked for a summary of my request and seamed genuinely interested in the whole idea of remote control.

For the third time I submitted my document. Within a week I had an email back saying “This function has been outsourced to the RSGB, please contact them on this matter. I let out a deep sigh as I realised I had to go and speak to the ETCC. I think in previous newsletters I have mentioned they seemed not to be able to grasp that providing an ERP means I have taken into account gains and losses in the transmission system and provided all the information Ofcom require. The make up of the coax is part of the system loss calculation and its bloody colour makes no difference to this calculation!

At the start of November after “Dumbing down” my proposal I submitted it to the operative that’s responsible for Digital systems at the ETCC. I had no response or acknowledgement to this email! I sent a second email a week later, again nothing. This was also true for my Third email.

Getting frustrated my forth mail included our regional manager, our own repeater group email address and the chair of the ETCC.

Andy (G7KNA) did respond to me so I know the email got through and I also got the email via the repeater group. But to date (13/11/20) not a single conformation back from the ETCC, absolutely nothing!

Since writing the above I made a couple of Phone calls and obtained no less than 8 separate email addresses for the ETCC chairman. Armed with this quantity of email address’s there only one thing one can do. You guessed it. I sent my original email and its attached proposal to all the email addresses I had!. Guess what! I had a reply from the Chairman. Comments were made about spam filters and Barracuda mail filters etc. (I administrate Barracuda professionals so I do know there is a vague sniff of truth about it blocking emails – But there is nothing in my email that would trigger a block, unless all knobs are to the right, in this case NO email would ever get through).
He also informed me that he would pass on my email to the guy responsible for Digital systems. I am hoping that the document I sent is not too technical!

I bet you if I just went a head and implemented the plan without ETCC blessing I would certainly get a response then. Or would I ??

For now the original solution Is still in place. MB7UVV being the Internet > RF gateway which is then Digipeated by MB7VV which is the RF > Internet path.

Bristol 70cms Repeater Group – Membership.

Membership during 2019/2020 is probably best described as being fairly flat & stable. Throughout the past year membership would undulate up & down, a bit like a Weston Donkey.

At this time last year we had 47 paid members, with a peak of 55 earlier in that year. As 2020 draws to a close we currently have 49 paid members, with this year seeing a peak of around 54. So all in all, no big gains and no big losses.

As with most years, we see new members join us and at the same time there are those that choose to leave or just let their membership laps and unfortunately are usually never heard of again. People come and people go, that’s life !

This past year there has been a small increase in new stations testing the BS waters, both on GB3BS & GB7BS, but only a few actually make the point of finding out about our group and, maybe, ultimately choosing to support us. All we ask is that if you use it - then please think about supporting us.

As is often said, “You can lead a horse to water, but you can’t make it drink”.

The last two years especially has seen our highest expenditure for some time. As already mentioned in this and last years newsletters, this has been on building repairs and maintenance including the new double doors that just had to be replaced.

We mention every year, and rightly so, that without support by way of our membership base & donations we would not be able to do what we do, in the way that we do it. We pride ourselves in providing a good, friendly and reliable repeater service to the locality.

So, on behalf of the BS Repeater Group we would like to sincerely thank **EVERYONE** out there who has supported us by way of Membership & Donations, both past and present. You can be assured that every last pound of your money goes into the running & maintenance of the repeater equipment (including the good old diesel Generator) and the building in which it is all housed.

Membership status as of 12th December 2020

2E0BZU June 2021	**2E0EOL** Apr 2021	**2E0JWJ** Dec 2020	**2E0PGS** Jan 2021	**2W0CGM** Feb 2021	**G0FAJ** Oct 2021	**G0GZW** July 2021
G0IUE Feb 2021	**G0IWT** Aug 2021	**G0XAY** June 2021	**G1ZKJ** Jan 2021	**G3LZN** Life Member	**G3XED** Jan 2021	**G3XOB** Dec 2021
G4EJH Jan 2021	**G4FUA** Nov 2021	**G4GUG** Nov 2021	**G4KAM** Sep 2021	**G4KUQ** Sep 2021	**G4MCQ** July 2021	**G4OJI** June 2021
G4OPQ Oct 2021	**G4SDR** Oct 2021	**G4TAH** Nov 2021	**G4WOD** April 2021	**G4XCB** Dec 2021	**G6FFB** May 2021	**G6MRJ** May 2021
G6YCG Nov 2021	**G6YNL** Feb 2021	**G7BYN** Nov 2021	**G7FBD** June 2021	**G7KNA** Dec 2020	**G8CKK** Nov 2021	**G8NQO** April 2021
G8YMM Jan 2021	**GW1LOR** Feb 2021	**M0HDJ** Nov2021	**M0KEE** May 2021	**M0LHS** Oct 2021	**M0LJT** Nov 2021	**M0LUF** May 2021
M0MGT Jan 2021	**M0XMM** June 2021	**M0ZLI** Feb 2021	**M1CEL** July 2021	**M6GFM** Dec 2021	**M6NQJ** Oct 2021	**M6OJI** June 2021

Current Active members. 49	1 Month or less Membership remaining.	2 months or less Membership remaining.	3 Months plus membership remaining.

REMEMBER: If you have received this newsletter via email but do not see your callsign listed in the table above, then this means your membership has now expired. You would have received an invitation to renew on the 1st day of the month you expire via email. (Check your SPAM box). The Repeater Group would welcome you to re-join, but if that is not to be, then we would like to take this opportunity to thank-you for your past support and inform you that no further Newsletters will be sent to you.

However, it's never too late to renew or rejoin the Repeater Group. It's fast and easy via the PayPal Me method. Just follow this link **https://www.paypal.me/GB3BS** and just follow a few steps and your done.

Reader's Feedback.

We would love to hear what you think of the newsletters we send you. Are we doing things right, is there stuff you would like to know more about that we perhaps do not cover? Please take a moment & complete our online survey and let us know your views. **You don't have to tell us who you are.**

https://www.smartsurvey.co.uk/s/QVMO8Y/

Bringing the Newsletter to an end.

This almost brings this the 2020 Bristol 70cms Repeater Group newsletter to an end. Let me thank every one of you that support the group, for helping to keep both boxes on air and available for use. I am not sure about you, but I will be glad to see the back of this year and the issues, pain and sadness it has brought to many throughout the world. Personally I hope that any medication that can bring an end to this world pandemic is made available to all of us where ever we live on this planet.

Please stay safe and protect the ones you love!

73' to each and every one of you. Seasonal Greetings

Mark - G4SDR and Mat - G7FBD/KG7FBD/DU5FBD

The Bristol 70cms Repeater Group.

THE BRISTOL 70cms REPEATER GROUP.

GB3BS / GB7BS

Website: www.gb3bs.co.uk Email: info@gb3bs.co.uk

If you use the Repeaters, GB3BS or **GB7BS** and would like to support the group then all you need to do is fill out this form and part with **£8.00**p. Your details and membership fee will then be passed to our treasurer. You can also subscribe using Paypal[tm] (also supports Credit/Debit card payment). See "Membership" on our website for detail. 100% of your membership goes towards looking after both repeaters and the site in which they are located.

PLEASE REMEMBER

Repeaters do cost money to run.
Without members the repeaters GB3BS and GB7BS would cease to exist.
Please help support what you use.

Please make cheques payable to "Bristol 70cms Repeater Group"

Please tick appropriate boxes and print clearly – Thank you.

☐ £8.00 Membership ☐ Donation Amount £_____

I am paying by **CHEQUE / CASH** **Please delete the appropriate.**

Callsign: _____ Email: _____

Name: _____

Address: _____

_____

_____

Postcode _____

If you wish to post or BACS your membership. Please contact us for address/Bank details: info@gb3bs.co.uk.

PLEASE NOTE: Membership is based on a yearly subscription (from the date processed). Although we can process advance yearly membership we would discourage this method. At present we DO NOT have a "Family" membership, or any other concessions. Please also note ALL membership fees and donations are NON refundable. We recommend you do not send cash through the postal system. The Bristol 70cms Repeater Group cannot be held responsible for lost or missing payments. Being listed on our website is conformation of membership. No receipts are issued unless a stamped address envelope has been provided. Membership is used for the upkeep of BOTH Repeaters.

Any information/data provided will ONLY be used to mail or email you our newsletter and send membership reminders. Data will be deleted 6 Months after the laps of any membership. Reminders of pending membership laps will be sent via email where possible one month before the expiration date. The membership section of our website also reflects this information.