Newsletter

Chesham & District Amateur Radio Society

We meet the 2nd and 4th Wednesdays of the month at the Ashley Green Village Hall, Ashley Green, HP5 3PP

Welcome

HF contesting is back this month, see Contest Corner for details.

Want to do screen shots of your waterfall without a camera? If you have an Icom 7300, or Yaesu FTDX10, see page 3 on how to do it, the results are great!

I've added a list of slow Morse transmissions/frequencies/operators/area's in addition to Jeremy's CW Corner, those wishing to learn Morse code might find this helpful.

Thanks to Jeremy for his Spotlight on Bobov Dol, Bulgaria, with the current energy crisis, did they do the right thing by switching to natural gas?

This year marks the 40th anniversary of the Falklands War, on the 31st August we had a Zoom meeting showing the RSGB video, page 6 details work done by other amateurs during that period.

The National Radio Centre at Bletchley Park features in this month's newsletter, interesting things are happening there.

Angie and I attended the G-QRP Convention in Telford, day 1 was about the Kanga QRP A.T.U. Buildathon, which we both attended, day 2 was talks on various aspects of QRP radio and the Rev. George Dodds.

Bryan M0IHY

In this issue

Contact details

Chairman   - Jeremy Brown (G3XZG)   Secretary - Malcolm Appleby (G3ZNU)   Treasurer   - Matt Whitchurch (M1DTG)

- Guy Plunkett (M0GUY)   - Dave Keston (G8FMC)

All the above are members of the committee and can be contacted on cdars-committee@googlegroups.com

Editor - Bryan Page (M0IHY)

Chairman's Ramble

I am writing this on the morning after, so to speak, SSB field-day.

Firstly, thanks to all who were able to help in any way, setting up, taking down, operating and logging, provided equipment and moral support.

Conditions on HF, thanks to solar activity, were poor on the Sunday particularly, which meant that our score was considerably down on last year, but all UK stations would have experienced the same and we will still have a respectable entry for the section we were in.

The off-centre dipole worked well and its odd to think that the next time we use it may be Brill next year. A good thought to keep in mind perhaps as we head into autumn and winter.

We also found out the easiest way to put up the club tent, I suspect that reading the instructions helped with that. We discovered that we had set up the station in the bedroom part, which was less drafty, but actually the night was quite warm for staying there, and I simply moved the chairs out and put the cushions down between the station and the drinks table.

The forecast for the weekend had included quite a bit of rain, most of which did not materialise.

August was a quiet month at the club and I spent the first two weeks on holiday in Shropshire. I took a handheld and had great plans to sit up on Long Mynd, and do some FM operating while my wife sat and read her book. For some reason, we only managed to do that once, and although I could access a repeater, (not sure which), there was nobody else on. Ah well, we have booked to go back next year as we were so impressed with the area, so maybe I will be better organised. I can certainly see the attraction of the Long Mynd as a portable location. At its highest it stands at 537 meters ASL, and has good take-off all round. We were told that to the east, the next point of equivalent height is in the Urals.

We are now moving into the Autumn programme, with a talk from Roger G3MEH on simple HF antennas at the end of the month, a talk/discussion on coax and feeders in October, and Peter demonstrating his home-made Moxon.

We also have the annual quiz with Aylesbury Vale RC, which will be on the 9th November at the Doghouse Inn, their normal meeting place, so we will be there that night instead of Ashley Green.

With the affiliated societies series of contests starting again, and our booking of the hall as last year, for the topband section of these on 12th November, it looks like being quite a busy few months.

I look forward to seeing you shortly.

73, Jeremy G3XZG

Editor's Muse

So that's what LED fish tank lights do to your received signals! With S9+25 QRM on 80m and slightly less on 160m and 20m, even a QRM Eliminator couldn't remove it! I have to wait until the 2nd week of September before my ferrite beads arrive from China (I tried elsewhere but no joy there, honest!) so it will be next month's newsletter before I describe what I did and what effect it had (fingers crossed).

Angie and I were invited to attend the G-QRP Convention in Telford on the 3rd and 4th of September, I took part in the Buildathon (which started on the Saturday and ended on Sunday), the project was the Kanga UK, End Fed Half Wave Antenna Tuner with built in SWR indicator, it was a fun build, see it on page 9.

Bryan M0IHY

Screen dumps of your waterfall

Last month I reported on the problems I was having with severe QRM and wanted to photograph the waterfall on the rig to show what was going on, it's fiddly job with a camera, well, there is another way of doing it.

Yaesu FTDX10

Ensure you have an SD card inserted into the front panel (just below the front screen), if you press the card into the slot it may ask "Setup?", answer "No" to this, it's then a simple task of pressing and holding the **Mode** button until it says "**SCREEN SHOT**" in the centre of the window (let go of the **Mode** button at this point), the whole screen has now been saved in a date/time named file, this can be found in the **Capture** folder inside the **FTDX10** folder, which is at the top level of the SD card.
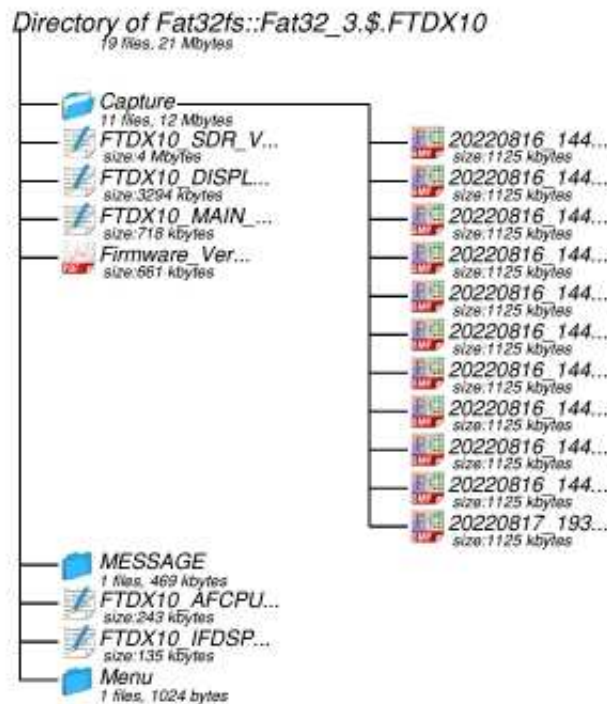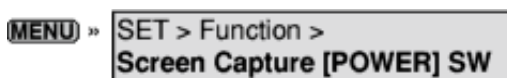

Here is my example of screen dumps on the SD card

ICOM 7300

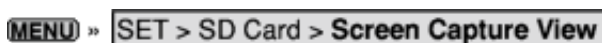**Capturing a screen** (ensure you have an SD card inserted)

1. Open the "Screen Capture [POWER] SW" screen.

2. Select "ON" by rotating and pushing the (MULTI) button
3. Select the desired screen to capture.
4. Push (POWER) to capture the screen.

Viewing the captured screen

1. Open the SCREEN CAPTURE View screen.

   The capture list is displayed.
   The latest screen capture is at the top of the list.

2. Select the desired screen capture to be displayed by rotating and pushing (MULTI)
   The selected screen capture is displayed.

3. While a screen capture is displayed, you can scroll through all the screen captures by rotating (MULTI)

CW corner

Ah well, it seems that nobody has tried out my idea of learning CW, so, let me explain why I proposed trying to send letters to yourself. I think it is easier to learn Morse by hearing it and then sending it, than perhaps it is by looking at the letters on the chart. There are, I know, a number of apps and Internet resources for listening to, and learning the letters. I'm not going to recommend any here, for fear of the "other apps and programmes are available" scenario, but I know that some members have already accessed these and no doubt you can compare notes. What I think those resources don't give is much in the way of interaction.

If you are confused between a number of letters, try listening to the letter and then sending it. I hope you will find that sending it fixes it more easily in the memory. The point is that you are in control of what you are sending and not just reacting to what is being sent. If, for instance you are confused between Q and Y, or between F and L, then start to send them alternately or repeatedly to yourself. These are pretty common confusions.

Once you are sure that you can identify an individual letter correctly and send it, moving on to words is the next step.

I'm going to assume when doing this, that the idea of learning CW is to be able to hold QSO's in it. So I will start with common sets of letters or words that occur in a standard QSO.

The trick to identifying these, is not to think so much about the individual letters themselves, but to hear and recognise the pattern.

First, try sending your own callsign. Getting that right in a QSO should give you some confidence about what comes next. Then try sending the letters DE, as that's used in QSO's for "this is" as in G3ZNU DE G3XZG. Try sending somebody else's callsign, it doesn't matter who, just for practice.

Then try sending the letters CQ.

All these are patterns which you will hear regularly and if you can recognise the pattern itself, you wont have to think "oh that's a D and that's an E" or separate out the C and Q. That makes life a lot easier.

If you are not confident on particular letters, try sending patterns that don't include them. Sadly Q gets used a lot for obvious reasons.

More next month, but again, feedback welcome.

Jeremy G3XZG

Ed: Below, and on the next page, are the frequencies and times of the slow Morse as described at the RSGB website.

HF

Day	Local Time	Frequency (MHz)	Operator	Area Covered
Monday	20:15	3.555	G4BSW	Kent (Margate)
Tuesday	20:00	3.555	GW0KZW	Prestatyn
Thursday	09:00	3.605	G3UKV	Telford
Friday	20:00	3.563	GW0KZW	Prestatyn

CW corner

VHF

Day	Local Time Time	Frequency (MHz)	Operator	Area Covered
Monday	10:00:00	145.250	Headcopy Class G3LDI	
	18:30:00	145.250	M0APY	Leeds
Tuesday	09:00:00	145.250	G4OOC	Pontefract
	10:00:00	145.250 GB3NB	G4CCX	Norwich area (Intermediate)
	18:00:00	145.250	M0HAZ	Skegness***
	18:30:00	145.250	M0APY	Leeds
	19:00:00	145.250	G5FM	Glastonbury
	19:00:00	145.250	MI0WWB	Newtownards
Wednesday	09:00:00	145.250	G4OOC	Pontefract
	19:00:00	145.250	G0VCW	Lowestoft
	19:30:00	144.2508 (USB)	G3XVL	Ipswich
Thursday	09:00:00	145.250	G4OOC	Pontefract
	10:00:00	GB3NB	G4CCX	Norwich area (Intermediate)
	11:30:00	145.250	MX0NCA	East Runton
	18:00:00	145.250	M0HAZ	Skegness
	18:30:00	145.250	M0APY	Leeds
	19:00:00	145.250	GM0EDJ	Johnstone
	19:00:00	145.250	G3XNE	Bude
	19:15:00	145.250	GM0UOU GM0EDJ	Elderslie, Renfrewshire*****
	19:30:00	145.250	G0TDJ	Crayford (Kent)
	20:00:00	GB3NB	G3PDH	Norwich area (Advanced)
Friday	18:30:00	145.250	M0APY	Leeds
Saturday	08:00:00	145.250	G0VCW	Lowestoft
Sunday	20:00:00	145.250 (Voice) 145.250 (CW)	G4PVB	St Albans

So there you have it, times, frequencies and operators, as listed on the RSGB website, the nearest to the club would be Sunday's at 20:00 from St Albans.

The Falklands 1982 and Amateur radio

On the 31st of August we had an RSGB video on the Falklands war of 1982 and the involvement of Amateur radio during this period, narrated by Laurie Margolis (G3UML), he told how he reported this to the world through his job at the BBC, he did however say that he was not the only one contacting hams in the Falklands, what follows is a brief story of Les Hamilton (GM3ITN) and his part in the scenario.

Les Hamilton (GM3ITN) at his rig.

Credit https://content.redpitaya.com/blog/6-most-famous-radio-amateurs
Les Hamilton was a Scottish ham radio operator who first alerted the British government that the Falkland Islands had been invaded by Argentina. During the occupation he was the only person in Britain to be in regular radio contact with the islanders.

Credit http://www.southgatearc.org/news/2022/april/role-of-radio-amateurs-during-invasion-of-the-falkland-islands.htm
Role of radio amateurs during invasion of the Falkland Islands
The Scotsman newspaper reports on the role played by radio amateurs Tony Pole-Evans VP8HZ, Bob McLeod VP8LP and Les Hamilton GM3ITN of Clydebank, during the invasion of the Falkland Islands 40 years ago

The paper says the invaders "... visited Tony Pole-Evans [VP8HZ] - a farmer living on tiny Saunders Island, about 80 miles north-west of Port Stanley and took down his antenna.

But they were unaware Pole-Evans had another, smaller, radio system which had enough power to travel the 7,000 miles to Hamilton's Clydebank radio station [GM3ITN].

Despite the threat to Pole-Evans' life if he was caught, the two friends stayed in daily radio contact throughout the war - a crucial source of information for British military intelligence."

Credit https://scotsman.com/news/clydebank-radio-ham-helped-win-back-falklands-2510342
Clydebank radio ham helped to win back the Falklands
Armed with a shortwave radio in a room in his Clydebank home, he was Britain's secret weapon in the Falklands war.

The Falklands 1982 and Amateur radio

Les Hamilton was the amateur radio operator who told the British government the islands had been invaded and the only person in Britain to be in regular radio contact with islanders during the Argentinian occupation.

He was the vital link through which details of enemy troop movements and the success of RAF bombing raids were fed back to the Ministry of Defence.

The information he provided was considered so important to the success of the war that within minutes his information was relayed to the task force in the South Atlantic.

Yet until now Hamilton's role has been a closely guarded secret, known only by senior British politicians, military intelligence officers and a select band of amateur radio enthusiasts.

With just weeks to go before he and his wife Pilar are due to fly out to the Falklands for the 20th anniversary celebrations of the liberation, Hamilton has told Scotland on Sunday of the excitement and fear of being the only outside link for islanders during the dark days of the 1982 occupation.

Hamilton is one of just 16 people to be invited by the Falkland Islands government.

He had been in contact with amateur radio operators on the islands for more than a decade when, on April 1, his Antarctic friends started becoming jumpy about a possible Argentinian invasion.

The following day he received a fateful radio message from his friend Bill McLeod at Goose Green - the Argentinian flag was now flying over the islands.

Hamilton was the first person outside the islands and Argentina to know that the invasion had taken place. He quickly phoned the MoD, who informed the Prime Minister Margaret Thatcher.

Within three days a naval task force had been assembled and was sailing for the southern seas. Britain was at war and Hamilton and his network of Falkland Island radio hams were now the only link between the Falklands and the British government.

But the Argentinians were already aware of the threat that the radio hams posed and started seizing radio equipment from isolated settlements across the islands.

They visited Tony Pole-Evans - a farmer living on tiny Saunders Island, about 80 miles north-west of Port Stanley and took down his antenna.

But they were unaware Pole-Evans had another, smaller, radio system which had enough power to travel the 7,000 miles to Hamilton's Clydebank radio station.

Despite the threat to Pole-Evans' life if he was caught, the two friends stayed in daily radio contact throughout the war - a crucial source of information for British military intelligence.

"At the start, when the conflict broke out, I was excited, thrilled even at being at the centre of these amazing events, in the right place at the right time," Hamilton said.
"About 24 hours before April 2, friends on the Falklands were very jumpy, so when the message came through from Bill McLeod, a friend from Goose Green, about the Argentinian flag now flying over the islands I passed it straight on to the Ministry of Defence.

"But towards the end we were warned by a military intelligence officer that Tony would be taken outside and shot if he was caught, so I was very frightened for him."

Just before the invasion, the pair had devised a special code which allowed them to stay in contact and avoid Argentinian attempts to monitor radio communications from the islands. Each daily contact began with Hamilton announcing a number, which referred to a personal code known only by Hamilton and Pole-Evans and led both to retune to a specific radio frequency.

The Falklands 1982 and Amateur radio

Once both were at the new frequency, Hamilton would take Pole-Evans through a list of questions supplied by the MoD about Argentinian troop movements and the success of British bombing raids.

Pole-Evans would answer as briefly as possible to avoid his transmissions being detected by the Argentinian military.

The occupying forces tried to enforce radio silence on the two main islands but did not have the manpower to occupy all of the 200 islands which make up the Falklands.

Outlying settlements were able to use radio to communicate with each other and doctors based in Port Stanley.

Pole-Evans would listen in and work out which settlements were free of Argentinian troops and then pass on the information to Hamilton, who had a huge map of the islands on his wall. Hamilton would then phone the MoD.

The former printer told Scotland on Sunday: "Tony was able to get information on troop movements, the location of minefields, and how well British bombing missions by Harriers had gone. When I was debriefed after the war, I was told our information was beamed out to the British Task Force within minutes of my call because it was so useful."

Using their 35-foot antenna connected to 1,000 of radio equipment, the Hamiltons also managed to intercept Argentinian military communications which Pilar - a lecturer in Spanish at Strathclyde University - translated for the MoD.

After the war Hamilton received letters from both Margaret Thatcher and a senior Army official in charge of military intelligence thanking him for his efforts.

Hamilton's visit to the Falkland Island's for the anniversary on June 14 will be the first time he and Pole-Evans have met. Pole-Evans, now 82, told Scotland on Sunday: "I am looking forward to meeting Les for the first time. It was a very frightening time but we did our bit."

Sam Bailey, a spokeswoman for the Falkland Islands government, said they would be delighted to welcome the Hamiltons to the islands.

Hamilton will find himself with figures from the war including Brigadier David Chaundler, who commanded 2 Para after the death of its commander H Jones at the battle of Goose Green, and Rear Admiral Sam Salt, who was in command of the vessel HMS Sheffield when it was struck by an Argentinian Exocet missile.
Hamilton said he regarded the invite as "a reward" for the work he and his contacts in the islands had done during the conflict. More importantly it was an opportunity to meet them.

"I am absolutely delighted to be going out to see friends in the flesh whom I have been speaking to via radio for years," he said.

Credit http://www.southgatearc.org/news/2022/april/role-of-radio-amateurs-during-invasion-of-the-falkland-islands.htm
BBC journalist and long-time RSGB member Laurie Margolis G3UML broke the fact of the invasion of the Falklands through amateur radio.

Ed: It's strange that Laurie Margolis (G3UML) worked for the BBC and that Les Hamilton's callsign ends in 'ITN'.

The Kanga QRP A.T.U.

The finished item.

My thanks to Kanga (www.kanga-products.co.uk) for permission to reproduce the assembly instructions.

End Fed halfwave 40-15m QRP ATU

You can have the latest all singing all dancing radio with DSP and a fancy LCD screen but its of little use if you don't have a antenna. The antenna is the most important part of the system. If you're operating portable it can be hard to quickly setup a antenna, personally I love the good old fashion dipole, it's big disadvantage is that it needs a way to get the centre up high and then you need to find two supports for the ends. Not that practical is it? So what else can we do? Well possibly the most popular antenna for portable or temporary use is the endfed wire, and the most common must be the endfed half wave. The EFHW has a number of advantages. Just one end needs fixing at a height, when matched, the feed point is at a voltage max with little current so the counterpoise often can be ignored or for best results a short (0.1 - 0.2 wavelength) is all that is needed, often people just use the coax it self as a C.P. The current on the coax will be low as it's a high voltage feedpoint. The BIG problem is that the EFHW typically has a feedpoint impedance of thousands of ohms not the 50 ohm's the modern transceiver needs, this device although often called a ATU is really matching the impedance of the antenna to that of the radio. This protects the radios PA and ensures maximum power transfer to (and from) the antenna.

The Kanga QRP A.T.U.
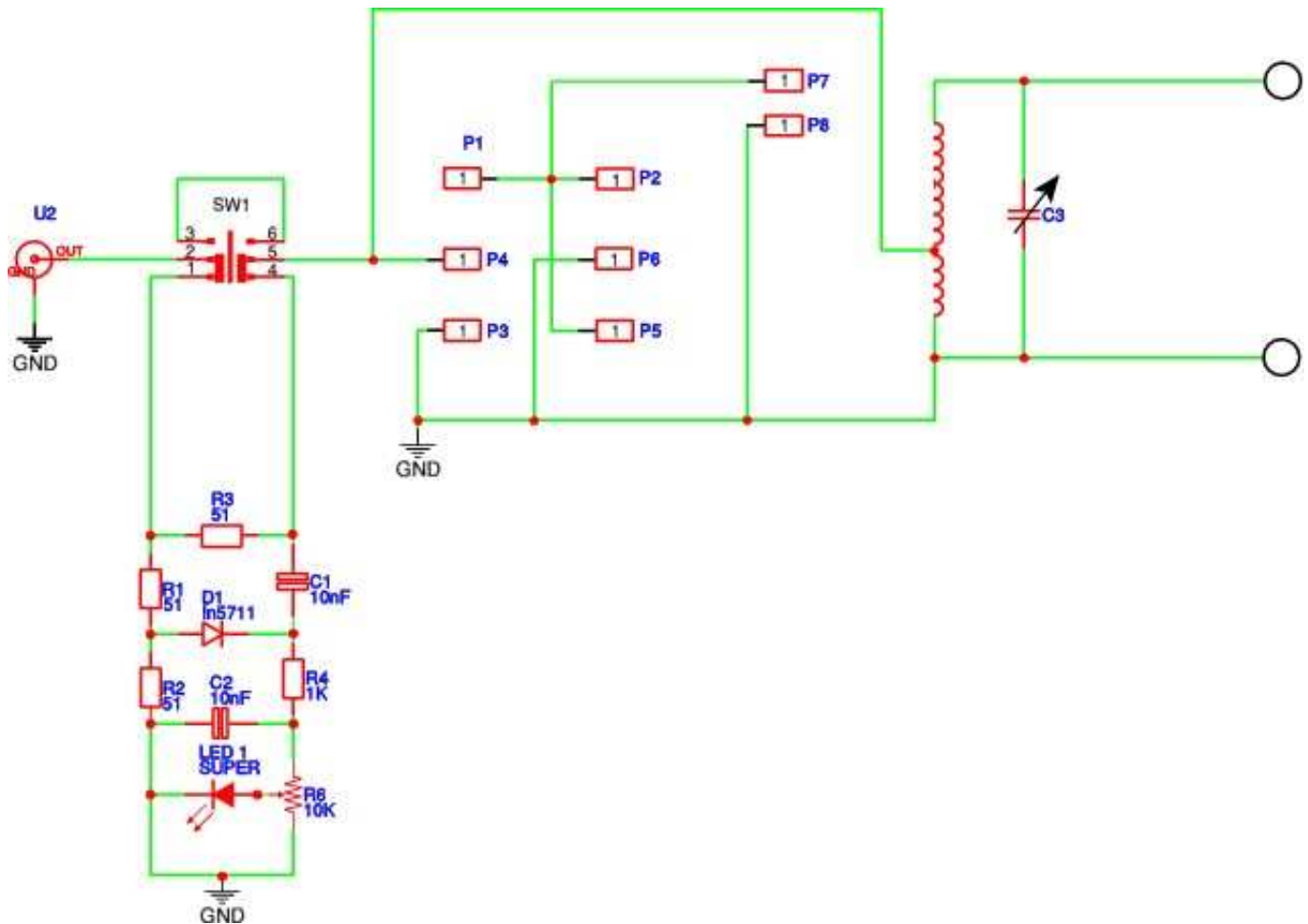
The A.T.U. Circuit

The EFHW uses a resistive SWR bridge with adjustable sensitivity, works well from a few 100mW up to the power limit of the ATU, I recommend keeping the power to QRP levels maybe a little more when matched.

Please ignore resistor ref numbers shown on the circuit as they changed on the new PCB.

Specification:-

Power Level :- 5 to 10 watts
Frequency Range 7 to 21Mhz (See notes at the end of this doc)

Note on Suggested antenna sizes:-

Please note, this is NOT a random wire tuner, it is designed to be used with a Half Wave length of wire for the band you are interested in, it will match this halfwave in the range of 7 to 21Mhz (40-15m Ham bands)

Although not always necessary a counterpoise can help improve the efficiency, a short counterpoise can be used of approx 1/10th to 1/20th of a wavelength.

It is also advisable to use coax fed of at least 5m, this helps keep RF away from the operator and the equipment.

Band	Antenna Length	Counterpoise length (approx $^1/_{10}$ wavelength)
40m	66ft (20m)	16ft (4m)
30m	46ft 6 inch (15m)	10ft (3m)
20m	33ft 3 inch (10m)	6ft (2m)
17m	25ft 10 inch (8.5m)	6ft (2m)
15m	22ft 2 inch (7.5m)	5ft (1.5m)

The lengths given are not exact as even the type of insulation on the wire will change the length not to mention nearby objects and supports. Also the part of the band you are using will mean the lengths given could need a tweak (figures here are most suitable for the CW end of the bands). I find these lengths will be

Parts List

Qty	Item
1	EF-ATU PCB
1	EFHW Front plate
1	Case
2	Terminal Posts (Black /Red)
1	BNC Socket
1	DPST Switch
1	Red 5mm LED
1	Variable capacitor
2	2.5mm x 5mm Cap mounting screws
1	2.5mm x 12mm extender shaft screws
1	1 x 10mm shaft extender
1	1 x Control knob
3	3 x 51 ohm 2 Watt resistors (R2, R3, & R4)
1	1 x 10K trimmer
1	1 x 1N5711 diode
1	1 x 1K resistor
2	2 x 0.01uF capacitors (5.08mm spacing)
1	1 x 0.01uf capacitor (2.5mm spacing)
1	T50-6 Core
700mm	700mm 25 SWG (0.5mm) enamelled Wire
2	2 x BNC connecting wire
4	4 x Stick on Feet
4	4 x front plate mounting screws

ok when used with the ATU as it can tune out these small differences.

The ATU uses a single T50-6 toroidal core which although fairly small is fine for the power levels (and higher) that we are running (QRP).

Warning! Boring Maths follows:-

Some of you who like a bit of maths may like to see how we work out the number of turns and the position of the tap on the coil, that way if you wish you can make changes to the circuit at a later date if you want to

change the coverage of the ATU.

First of all we need to understand that the EFHW antenna presents a high impedance at the fed point, typically thousands of ohms, our radios are normally expecting only 50 ohms so we need to transform this high impedance down to a level we can use. Typical people use a 49:1 matching transformer of some kind to bring this very high impedance down to nearer 50 ohms.

That's great and so we can use this in our design for the EFHW ATU.

To work out the turns ratio we need we take the square root of the impedance transfer so Square root of 49 (from the 49:1 transformer) equals 7. We need a ratio of 7:1 in our number of turns.

Ok so now how many turns do we need,

Well what is the lowest frequency we want our ATU to work on? Well I intended it to work over 40- 20m meters (but should work over a wider range at the high end, lets try for up to 15m) so that 7 to 21Mhz so a little lower than 7Mhz and a little higher than 21Mhz would be great.

Lowest frequency for the design is 6.5Mhz, we are using a 240pf variable capacitor so that's 6.5Mhz with the cap set to 240pf.

$$F_R = \frac{1}{2\pi\sqrt{LC}}$$

From the formula

with F=6.5Mhz and C=240pf we rearrange it and that gives us
2.5µH as the inductance

Now if we use this value and put that back into the same formula but this time with F=22Mhz and working out the capacitance we would get

F=22Mhz L=2.5µH so C= 21pf min cap

So it would seem that a 2.5µH inductor with our 240pf variable capacitor will allow us to tune the range we want.

So how many turns is that?

We are using a T50-6 and the data sheets for it tell us a few useful things, the calculation we need to look at is

µH = AL x (Number of turns)2 /1000

with a T50-6 AL=4 so...

We know the inductance we need, so if we calculate the turns we get (2.5µH *1000)/4 = (Number of turns)^2 which works out to 25 turns in total.

With 0.5mm or similar wire we can get 25 turns on the T50 core.

So what about the tap to give us the 49:1 impedance transformation?

So we know that the 49:1 impedance transformation is a 7:1 turns ratio ,

Divide 25/8 gives us just over 3. So if we set our tap point to 3 turns and the have a extra 22 turns after the tap we get what we need.

This is how I have worked out the windings on the toroidal.

Hope some of you found that interesting and those that didn't can wake up now.

Winding the Core.

Some people fear winding toroidal cores, don't worry this one is fairly easy to do if you just take your time and follow the steps below. You would be surprised how many times people tell me about problems with kits. When I look into it or they send me a photo of the 'problem' it's normally that they have done their own thing and not read or followed the instructions. Please save us both problems and follow the instructions for this core.

A recap, we need a total of 25 turns on the core, every time the wire passes through the core it counts as a turn. We need a tap at one end 3 turns into the winding and then an additional 22 turns.

Start with finding and straightening out the wire for the core, it's about 700mm long. This wire has a special enamel coating that can be burned off by soldering but more on that later.

The core you need is yellow and in likelihood will have one side grey

Many people find winding toroidal cores strikes fear into them, really they are easy to do. The one here should be well within the scope of anyone that takes care and followings the instructions.

The core needs to be wound with the 700mm length of wire supplied with the kit. It comprises of a total of 25 turns with a tap between the 3rd and 4th turn from the earth side.

I hope the pictures below helps. If you can look on the Phoenixkits web site for colour pictures of this core which will make things clear.
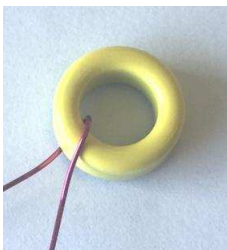
Start with passing the wire through the core as shown. Now wind 3 turns around the core, each time the wire passes through the core it counts as a turn. The short end of the wire should be down at 6 O'clock position as we start winding up towards in the 9 O'clock direction.
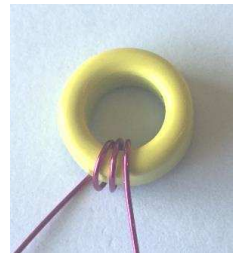

Now we need to form a loop.
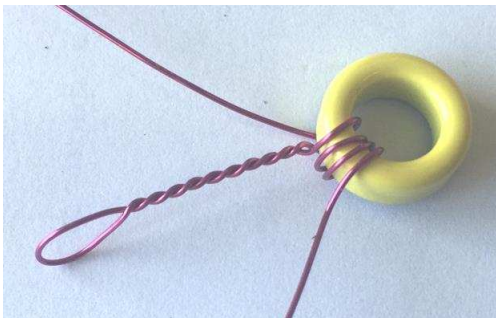
Make this loop around 1 inch long.

Not the direction that we are winding the core, it must be wound this way we started at the bottom of the core and are winding clockwise.

Now we continue to wind the core so we have an extra 22 turns after the loop.

When you have finished winding the core double check the number of turns. The best way to do this is to use your mobile phone or camera and take a picture, zoom in and then it should be easier to count the turns on the computer screen.
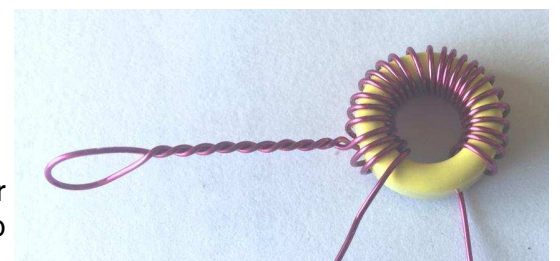
Ok we have done the hard part but we still have a difficult task to complete with this core. The windings are enamelled covered wire, the enamelling acts like an insulator and would stop any electrical connection to the wire. The wire I have used has a special enamel that will melt when exposed to the heat of molten solder, I find a light scraping of the enamel first will help with this task and even then you need to apply the soldering iron to the wire with a large blob of solder to melt it, you will need to apply the iron for a least 10 secs to the wire while feeding fresh solder to the wire, you will see a little puff of smoke and the solder will tin the wire as the enamel melts,
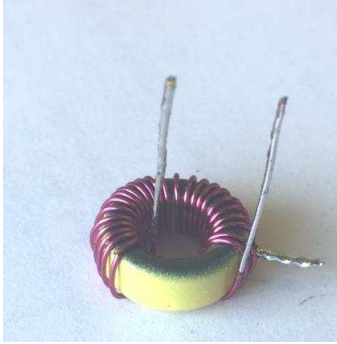
DO NOT breathe in the fumes, I am sure they are not good for you!
Look at the picture here to see what you're trying to achieve.

Once tinned you're ready to fit the core to the PCB. Put it on one side and let's start on the PCB.

***** Very Important Note *****

Please make sure you read the instructions below about mounting the extender shaft on the capacitor, it is easy to break the internal stops if you do this wrong .

Lets put the basic PCB together.

The board has parts fitted on both sides and it's important that the right part is on the right side of the board, also the order that you fit the parts is important as some solder pads are under the bodies of other parts.
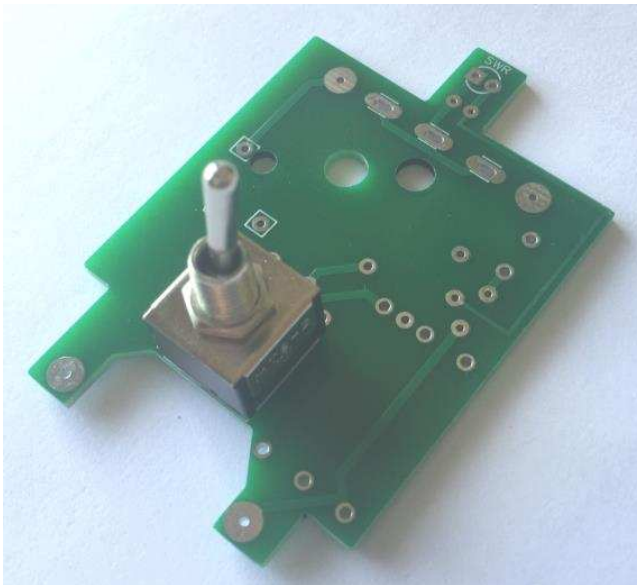
1. Fit the switch first, the switch must sit on the side of the PCB that shows the silk screen picture of the switch and you will see 'SWT' near one edge of the board, make sure that you push the pins through the board and that the switch sits straight and flush.

2. Now turn the board over and we can fit most of the other parts, I suggest fitting them in this order.

Fit the three 51 ohm 2 watt resistors, these act as part of the tuning indicator bridge and can get hot when you tune the ATU, the total power fed into the ATU will be shared with these three resistors and the antenna while tuning so in a worst case scenario with a short circuit on the output the three will share the full amount of RF power, since we are only using QRP
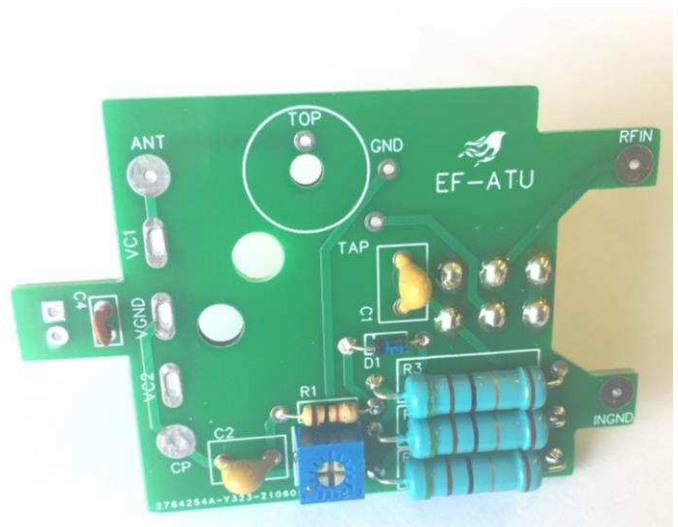
that would be a rated power of 6 Watts but of course we will be only applying power to the tuning bridge for a short time and we hope we will not have a short circuit on the output so these two watt resistors are suitable for our needs. (Also keep the off cuts for now!)

Fit the other small parts C1, C2, R4 and D1. Make sure that D1 is fitted the correct way round (see the silk screen layout on the board to see which end the band on the diode should be).

Now fit the small trimmer SWR adjust control. (Set this about ½ way at this point!)

Now we are going to fit the toroidal coil.
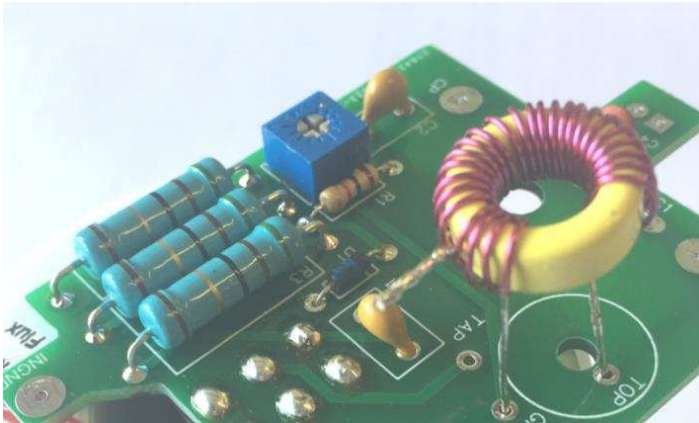
This core as two long ends and a tap.

Position it as shown here and push it flush to the board, do not worry about the tap at the moment we will sort that shortly.

Ok you kept the offcuts from the resistors didn't you? I hope so. Use one of these offcuts to connect the PCB to the coils tap, I make a little walking stick hook on one end that goes over the loop and drop it through though the board and the 'hook' over the tap, solder when done (both at the loop and under the board)

Now I strongly recommend that you use a meter and check for continuity between the ends of the coil. The best place to check this is on the two larger pads marked ANT and CP.

Well done the PCB is just about complete for now.

The next stage is to fit the two terminal posts. Remove the large securing nut from the posts and put the posts through the front plate and the box, make sure the front plate is lined up with the other holes in the box and secure the terminals with their large nuts. This is the second most difficult task, I find a good way is to unscrew the top section of the terminals and not the small round hole in the shaft. I place a thin 'watch makers' type screw drive into the hole to help me hold the post while I use a socket or small spanner to tighten the nuts securing the posts to the box. This can be a little awkward so take your time and make sure when done that the other holes line up ok with the front plate.
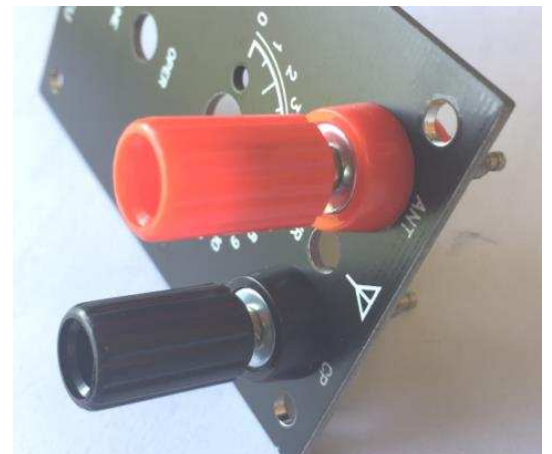
Now fit the BNC socket to the case.

BEFORE you fit this I find it easier to attach the wires to the socket and the earth tag. I have supplied two lengths of Silicone coated wire that is very flexible and works well for this. We can cut them to length later so leave them a little too long for now.

Now the case is pre-drilled for this connector but if you must you could enlarge the hole to allow for a SO239 connector if you wish.

Let's start putting this all together.
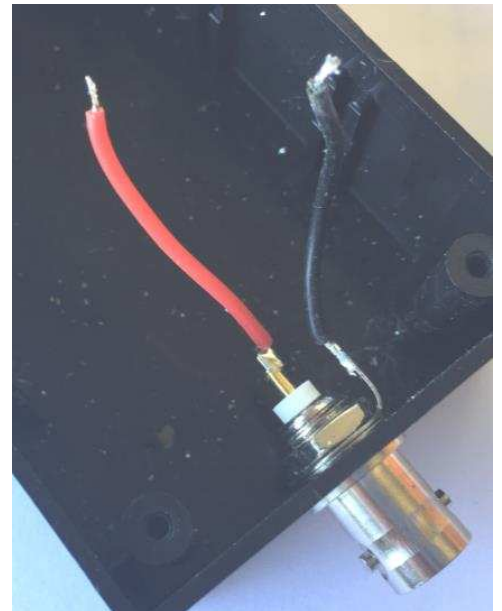
We have now to fit the capacitor to the front panel. First fit the shaft extender, it's a black 10mm long plastic shaft that is secured by a 2.5mm x 12mm screw, be careful here, you can damage the internals of the capacitor by applying to much direct force. Hold the small brass shaft with a pair if cutters while tightening the screw, this keeps any force of the internal parts.

Now fit the capacitor to the front panel using the two short M2.5mm screws provided. Make sure you fit it as shown. Adjust the two trimmers on the back for minimum capacitance (Fully open)

Now Remove the **TOP** nut and washers from the switch (not the bottom nut), drop the LED into the PCB just in front of the switch. Make sure that the long leg of the LED is nearest to the switch (the round hole). DO NOT Solder it yet!

The Kanga QRP A.T.U.

Now very carefully lower the top panel onto the PCB so that the 3 leads from the capacitor go into the three slots on the board for them. Double check that all three pins have gone through and none are just folded under the capacitors body. Also make sure the LED goes through the front panel too. (some of the following photos are of an earlier board with one less capacitor, you board will be slightly different)

Once you're happy make sure the board is sitting flush on top of the capacitor and solder the three leads in place and trim. Turn the board on its side now and look at the switch, you will most probably need to adjust the single nut on the switch to get it to touch the back of the front plate, this should level up the board. I use a small flat blade screw driver to turn the nut, you don' need to make it tight just get it to touch the front plate.

Now solder the two pins of the LED while making sure it's as far forward as it can go.

Now we need to connect to the two 4mm posts.

Use some of those off cuts from the large resistors for this. I solder them to the end of the posts but if you wish you can use the other nuts that came with the posts to secure the wire ends.

Now we need to fit the ATU into its case. We have already fitted the socket and attached wires.

Trim the length of wires so they just fit nicely and solder to the board, the earth tag wire goes to the pad marked GND and the wire from the centre pin goes to the pad marked IN.

Just about done now.

Place the top onto the case and secure with the 4 black self-tapping screws that come with it.
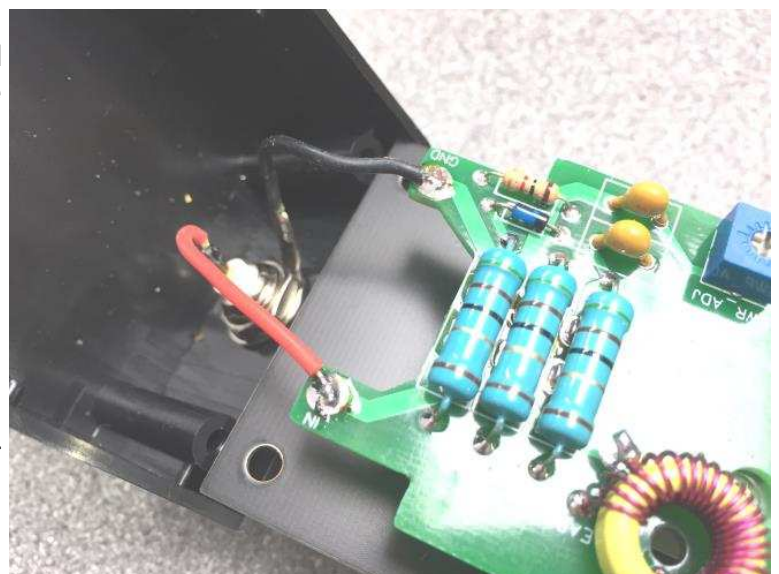
Turn the shaft of the capacitor towards the number 12 on the scale, now fit the supplied knob. The screw should be nearest the number 1 on the scale.

We are now finished and just need to test the ATU.

You must remember that this is HALFWAVE tuner, not a random wire ATU so you should use a antenna wire length to suit the frequency you're interested in, for this example I will be using 20m.

Halfwave for 20m

20m   Driven wire 33ft 3 inch (10m)   Counterpoise 6ft (2m)

I would recommend that you use at least a 5m long coax cable between the ATU and the radio. That keeps RF away from the radio and keeps things more stable.

Attach the wires, the main antenna to the RED terminal and the short wire to the BLACK terminal, the wire should be straight and in the clears as much as possible.

Now don't transmit yet.

Tune to a 20m frequency and then adjust the ATU while in receive mode. I find a when you find the sweet spot the RX noise will increase a lot. This is a good starting point. Reduce transmitter power to as low as you can and put the ATU in 'Tune' Mode, transmit a solid carrier (Key down or switch to AM/FM if you have no other way to give a solid carrier). Adjust the tuner to find the point the LED goes out, if you have already peaked the tune on RX it may not need much adjustment. Once happy that the LED is a dim as possible stop transmitting and flick to OPER mode. Now enjoy the QSO's.

While tuning try and keep the tune time low and the power low, when tuned you can increase the power level up to about 10 watts but while tuning try and keep the power to a couple of watts max. As always be careful with RF as you can get burns even at such low power levels. Don't touch the wire!

Tips, if like me you like to see a bright LED while tuning I set the sensitivity control to max,

If you want try removing the counterpoise wire, often people will state that you don't need one with a halfwave and often this can be the case, the antenna uses the coax as a counterpoise then, this can cause so RF feedback issues at the radio end but feel free to give it ago if you wish.

Trouble shooting

No led lights, try adjusting the sensitivity trimmer inside the ATU, failing that you may have fitted the LED the wrong way. If you have an in line SWR meter try that while tuning to see if the SWR is being adjusted by the ATU. If so it's most likely that you have put the LED in backwards.

The Kanga QRP A.T.U.

No match 17/15m or 40m

If you find it hard to get a match on certain bands it can be due to not having the correct antenna length, if you're sure that you do then it's possible that the coil could be giving the wrong inductance. Look at the coil and if you are finding it hard to get 17/15m then you have too much inductance, space the windings out a little more on the core can sort this out, if you're having problems not getting 40m then squeeze the turns closer on the core to increase the inductance.

If you have any problems drop me an email.

sales@kanga-products.co.uk

73 Paul M0BMN

Ed: If you enjoyed reading this and want to buy the kit, at the time of putting this to press the kit cost £27, which, in my opinion, is a steal, if enough of you want to try this, Paul will give the club a discount.

I spoke to Paul (M0BMN) of Kanga, at the G-QRP Convention over the weekend, he is prepared to give a club discount for any purchases made (the G-QRP club paid just £15 for the QRP A.T.U.).

Following are some of the kits I found at the G-QRP Convention.

The FMT Tutor (FISTS Morse Tutor)

CPO Oscillator/Tutor

QRP Desktop Transmatch

CPO Oscillator/Tutor

SSB Field Day

This years SSB Field Day had albeit a reduced team, Angie and I were up at the G-QRP Convention in Telford, and Matt (M1DTG) had proved to be covid positive on his return from the U.S.A.

The tent and OCF dipole, luckily the grass had been cut.

Jeremy (G3XZG) on the mic, Roger (M7RMF) logging.

A brilliant night-time shot of the tent.

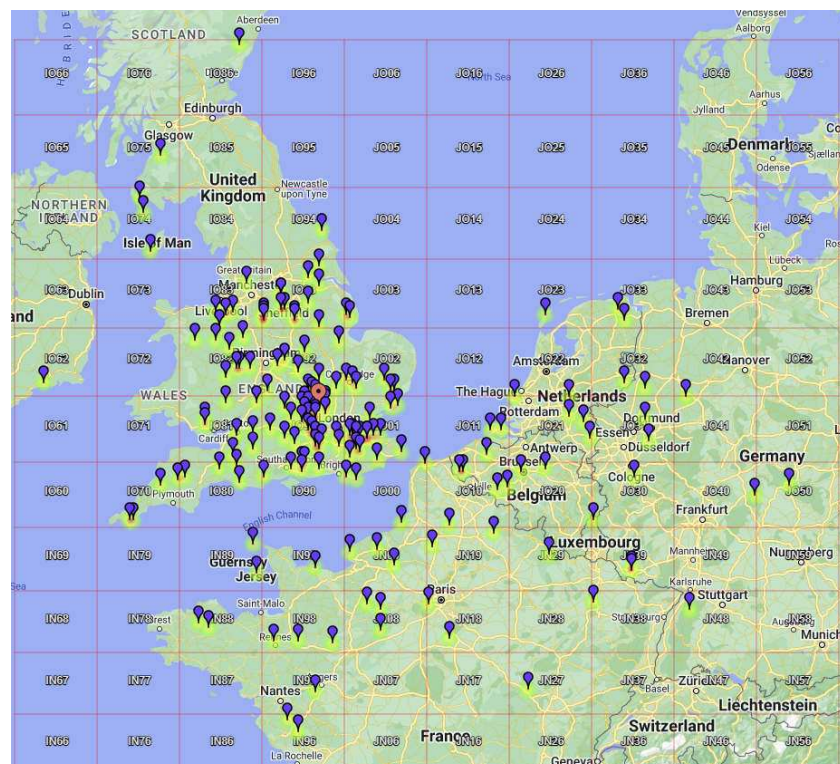**The OCF dipole, tent, Rogers van, and just about noticeable, the generator (centre picture).**

Roger (M7RMF) giving it his all while they take the tent down!

Roger's (G3MEH) 2m Trophy contest QSO map.

Phil's (M0NVS) tent, I'm not sure where the location was.

Phil's setup for the 2m Trophy contest, quite impressive and in such a small space.

Phil's antenna setup.

Spotlight - Bobov Dol

QSO with LZ1VFM, Kiril

Band:	14MHz
Mode:	CW
Date:	26th August 2022
Time:	15:56 GMT
QTH:	Bobov Dol
Coordinates:	42.22°N 23.01°W
Time Zone:	UTC +2
Population:	7962 (2016) fallen from 9000 (2011)

Flag   Coat of Arms

From the mid and wildish west, this month's spotlight moves to Bulgaria.

Bobov Dol is a small town in south-western Bulgaria with a population in 2016 of 7962, having fallen from over 9,000 in 2011.

When I spoke to Kiril, it was still sunny and with a temperature of 28°C.

The main features of the town would seem to be coal-mining and a thermal, coal-fired power plant with a theoretical capacity of 630 MW, but which in March this year was producing about 300 MWh. Perhaps not surprisingly, the power plant was threatened with closure as part of Bulgaria's contribution to the EU commission's green agenda.

Orthodox chapel near Bobov Dol

However, it was announced in March this year that it would convert to natural gas and green hydrogen, with a pipeline some 2 Km long, connected to the main natural gas pipeline running into North Macedonia.

Although I cannot find out for certain, I suspect the gas comes from Russia, so this may not have been such a good idea. Its closure would have been quite a blow to the town, as the last underground coal-mine in Bulgaria, which was situated there, closed at the end of 2018, making some 400 miners redundant. In its heyday, the coal-mining industry there employed up to 1500 miners.
The mine was privately owned, as it seems is the power plant, as on the threat of closure, the chief executive there wrote an open letter to Parliament and the Bulgarian prime minister asking them not to close it, before coming up with the gas plan.

Bobov Dol Power Plant

It sounds as though the town is struggling and is trying to cash in on its location near the centre of the Balkan peninsula, to bring in income from tourism. It advertises guided tours and is looking to build visitor centres and attract those interested in wildlife.

I wish it luck. I can't help feeling that many towns that went through similar convulsions of closing industry in the 1980s in this country, are yet to recover.

Jeremy, G3XZG

National Radio Centre - GB3RS

As a volunteer at Bletchley Park I receive monthly update emails, I thought this might be of interest.

Last week two really exciting events occurred - firstly Steve, 2E0YBJ worked the space station NA1SS and secondly, a piece of significant historical value was brought to the National Radio Centre by the granddaughter and grandson of G5FG who worked at Hanslope Park in 1943.

ISS QSO - NA1SS

Congratulations to Steve, 2E0YBJ for making a direct QSO from GB3RS with astronaut Kjell Lindgren using the callsign NA1SS on the ISS. This was a first for the National Radio Centre, an exciting moment for the Bletchley Park visitors watching-on and even more so for Steve, who said he was pumping with adrenaline. The National Radio Centre has applied for an ISS QSL card which, when received, will be displayed in the shack.

Fred George, G5FG
Visiting the National Radio Centre for the second time, Frank and Louise brought in an autograph book owned by their grandfather Fred George, G5FG along with a number of photographs taken, whilst working as a Royal Signals Captain for the Radio Security Service (RSS) at Hanslope Park in 1943. The autograph book, in remarkably good condition, is of significant historical value as it contains the hand written notes of more than sixty radio amateurs and short wave listeners, from all over the UK, all highly skilled in Morse Code, who either worked or trained with Fred at Hanslope as wireless intercept operators for MI6. This is the first time the autograph book has been seen outside the immediate family and copies are already with Government Communications Headquarters (GCHQ) historian David Abrutat for analysis.
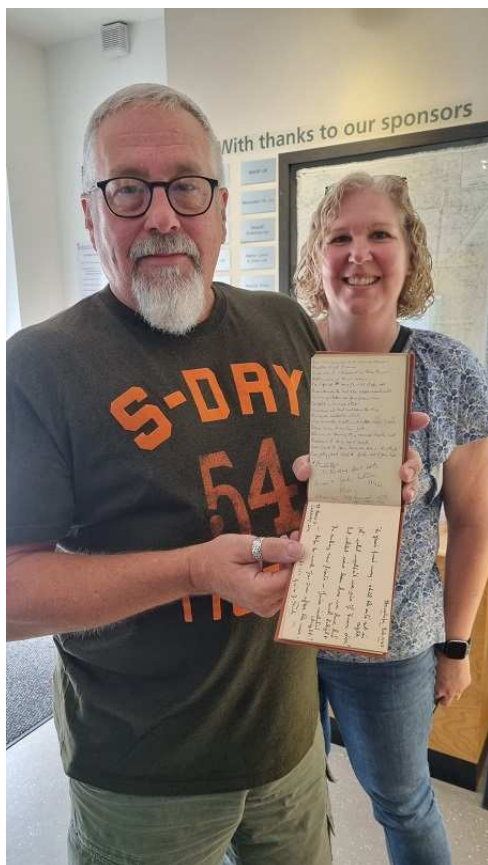
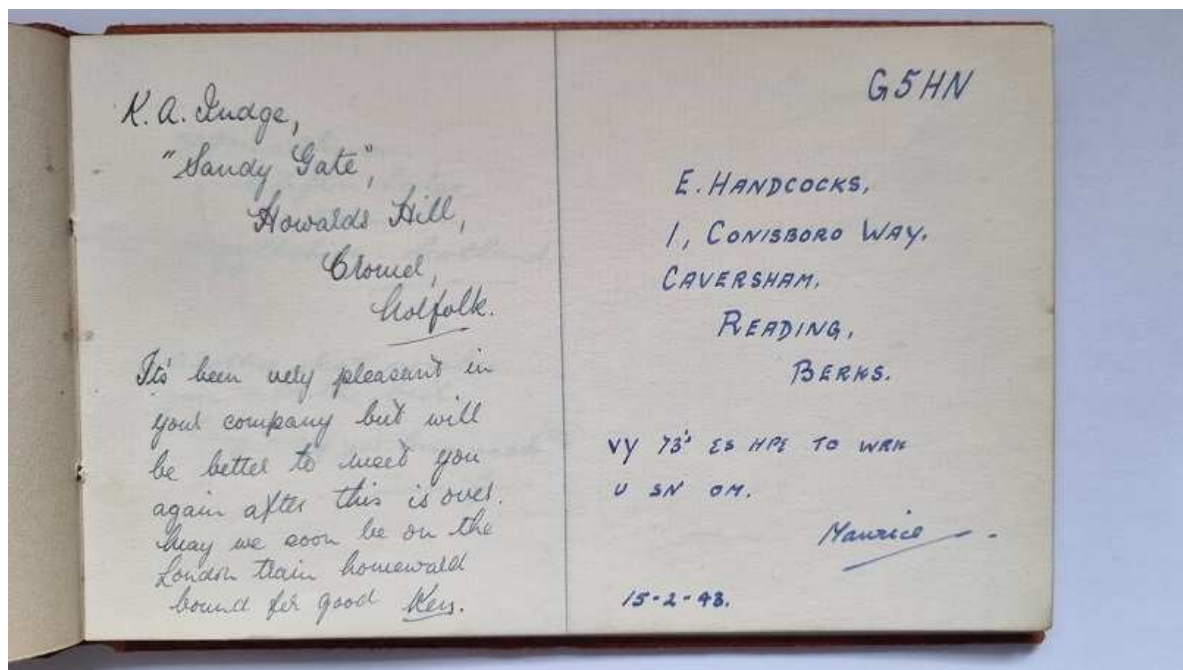**Frank with the autograph book.**

Frank, Louise and volunteers with the photographs.

The autograph book

POTA - G-0507
The National Radio Centre at Bletchley Park is now registered with Parks on the Air as G-0507, its locator is IO91PX.

Contest Corner

September

HF

Day	Date (2021)	Time UTC	Contest Name
Sat-Sun	03-04 Sep	1300-1300	SSB Field Day
Mon	05 Sep	1900-2030	Autumn Series SSB
Wed	14 Sep	1900-2030	Autumn Series CW
Thu	22 Sep	1900-2030	Autumn Series DATA
Mon	26 Sep	1900-2030	RSGB FT4 Contest
Sun	02 Oct	500-2300	DX Contest
Mon	03 Oct	1900-2030	Autumn Series CW
Wed	12 Oct	1900-2030	Autumn Series DATA
Sun	16 Oct	1900-2030	RoLo CW
Mon	17 Oct	1900-2030	RSGB FT4 Contest
Thu	27 Oct	1900-2030	Autumn Series SSB
Mon	07 Nov	2000-2130	Autumn Series DATA
Sat	12 Nov	2000-2300	Club Calls (1.8MHz AFS)
Wed	16 Nov	2000-2130	Autumn Series SSB
Sat	19 Nov	1900-2300	2nd 1.8MHz Contest
Thu	24 Nov	2000-2130	Autumn Series CW
Mon	28 Nov	2000-2130	RSGB FT4 Contest

VHF

Day	Date (2021)	Time UTC	Contest Name
Sat-Sun	03-04 Sep	1400-1400	144MHz Trophy Contest
Sun	04 Sep	1100-1500	5th 144MHz Backpackers
Tue	06 Sep	1800-1855	144MHz FMAC
Tue	06 Sep	1900-2130	144MHz UKAC
Wed	07 Sep	1900-2100	144MHz FT8 AC
Thu	08 Sep	1900-2130	50MHz UKAC
Tue	13 Sep	1800-1855	432MHz FMAC
Tue	13 Sep	1900-2130	432MHz UKAC
Wed	14 Sep	1900-2100	432MHz FT8 AC
Thu	15 Sep	1900-2130	70MHz UKAC
Sun	18 Sep	0900-1200	70MHz AFS Contest
Tue	20 Sep	1900-2130	1.3GHz UKAC
Tue	27 Sep	1830-2130	SHF UKAC

October

HF

Day	Date (2021)	Time UTC	Contest Name
Sun	02 Oct	500-2300	DX Contest
Mon	03 Oct	1900-2030	Autumn Series CW
Wed	12 Oct	1900-2030	Autumn Series DATA
Sun	16 Oct	1900-2030	RoLo CW
Mon	17 Oct	1900-2030	RSGB FT4 Contest
Thu	27 Oct	1900-2030	Autumn Series SSB

VHF

Day	Date (2021)	Time UTC	Contest Name
Sat	01 Oct	1400-2200	1.2GHz Trophy
Sat	01 Oct	1400-2200	2.3GHz Trophy
Sat-Sun	01-02 Oct	1400-1400	Oct 432MHz-245GHz Contest
Tue	04 Oct	1800-1855	144MHz FMAC
Tue	04 Oct	1900-2130	144MHz UKAC
Wed	05 Oct	1900-2100	144MHz FT8 AC
Tue	11 Oct	1800-1855	432MHz FMAC
Tue	11 Oct	1900-2130	432MHz UKAC
Wed	12 Oct	1900-2100	432MHz FT8 AC
Thu	13 Oct	1900-2130	50MHz UKAC
Sun	16 Oct	0900-1300	50MHz AFS Contest
Tue	18 Oct	1900-2130	1.3GHz UKAC
Thu	20 Oct	1900-2130	70MHz UKAC
Tue	25 Oct	1830-2130	SHF UKAC

'Air Miles', how far have we gone? / results

So, how have we done?

Quality this month, not quantity.

FT4 (MFSK) is the favoured mode with FT8 next and CW just a few percentage points behind that.

Japan is the most visited country.

(Running totals in red)   *General*

Most Miles

Call		Monthly	Total	
G3ZNU	🟨	216,186	730,059	⬜
G3XZG	⬜	49,106	475,381	🟧
2E0GUB			34,817	
M7SMI			3,721,560	🟨

Most QSO's

Call		Monthly	Total	
G3ZNU	🟨	79	292	⬜
G3XZG	⬜	20	268	🟧
2E0GUB			100	
M7SMI			2,322	🟨

Longest QSO

Call		Monthly	Total	
G3ZNU	🟨	VK3BOB(10511)	VK3BOB(10511)	⬜
G3XZG	⬜	HS0ZJF(6056)	XQ6XF(7707)	🟧
2E0GUB			KF2GV(3400)	
M7SMI			ZL3GAV(11785)	🟨

Shortest QSO (miles)

Call		Monthly	Total	
G3ZNU	🟨	G0LUH(19)	G0LUH(19)	⬜
G3XZG	⬜	DL7FAU(339)	G0SWU(22)	🟧
2E0GUB			M0CET(0)	🟨
M7SMI			G0BLQ(28)	

Average per QSO (miles)

Call		Monthly	Total	
G3ZNU	🟨	2,500	2,736	⬜
G3XZG	⬜	1,773	2,455	🟧
M0UBT			254	
M7SMI			1,664	🟨

Maidenhead Squares

Call		Monthly	Total	
G3ZNU	🟨	67	209	⬜
G3XZG	⬜	20	196	🟧
2E0GUB			35	
M7SMI			631	🟨

QSO Economy Drive

High miles per Watt

Call		Monthly	Total		Call		Monthly	Total	
G3ZNU	🟨	105.11(100)	105.11(100)	⬜	G3ZNU	🟨	0.19(400)	0.05(400)	🟨
G3XZG	⬜	60.56(100)	77.07(100)	🟧	G3XZG		3.39(100)	0.22(100)	🟧
2E0GUB			68.00(50)		M0UBT			0.06(50)	⬜
M7SMI			1178.50(10)	🟨	M7SMI			2.80(10)	

By Band

160m

30m

Call		Monthly	Total	
M7SMI			313	🟨
G3XZG			19	⬜

12m

Call		Monthly	Total	
G3XZG	🟨	1	18	⬜
M0UBT			2	⬜

2m

Call		Monthly	Total	
G3ZNU			29	🟨
M0UBT			7	⬜

80m

Call		Monthly	Total	
M0UBT			12	🟨
M7SMI			11	⬜
G3ZNU			4	🟧

20m

Call		Monthly	Total	
G3ZNU	🟨	57	62	
G3XZG	⬜	14	60	🟧
M7SMI			401	🟨
M0UBT			18	

10m

Call		Monthly	Total	
G3ZNU	🟨	1	94	🟨
M7SMI			26	⬜
G3XZG			4	🟧

70cm

Call		Monthly	Total	
M0UBT			40	🟨
G3ZNU			9	⬜

60m

17m

Call		Monthly	Total	
G3XZG	🟨	3	39	⬜
M7SMI			47	🟨
G3ZNU			10	🟧

6m

Call		Monthly	Total	
G3ZNU	🟨	19	74	⬜
G3XZG			80	🟨

23cm

40m

Call		Monthly	Total	
G3XZG	🟨	2	19	🟧
M7SMI			1,381	🟨
M0UBT			21	⬜
G3ZNU			1	

15m

Call		Monthly	Total	
G3ZNU	🟨	2	9	🟧
M7SMI			143	🟨
G3XZG			29	⬜
M0UBT			1	

4m

'Air Miles', how far have we gone? / results

By Mode

CW
G3XZG	🟨	20	264	🟨
G3ZNU			6	⬜

FT8
G3ZNU	🟨	27	218	⬜
M7SMI			2,313	🟨
M0UBT			5	🟧

MFSK
G3ZNU	🟨	52	52	🟨
M7SMI			9	⬜

SSB
M0UBT		74	🟨
G3ZNU		16	⬜
G3XZG		4	🟧

FM
M0UBT	21	🟨

By Country

G3ZNU	🟨	28	52	🟧
G3XZG	⬜	14	55	⬜
M7SMI			80	🟨
M0UBT			13	

Countries visited	-	31
Most visited Country	-	Japan - 14 times
Total Mileage	-	265,292
Total QSO's	-	99
Average miles per QSO	-	2,679.72
Total locators visited	-	85
Most visited locator	-	PM95 3 times

'Air Miles', this month at a glance
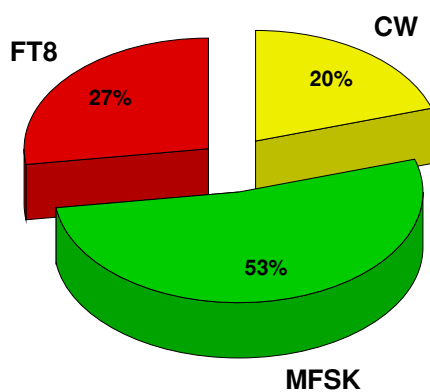
By Mode
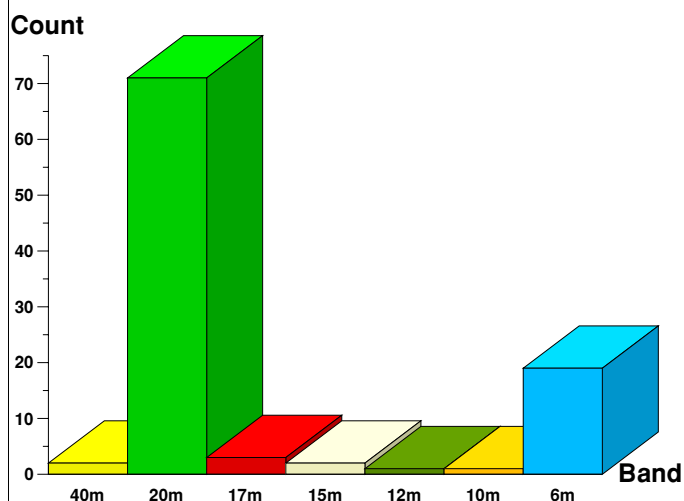
By Band

Japan	14	Brazil	2
United States	12	Croatia	2
Poland	9	Saudi Arabia	1
Germany	6	Portugal	1
Bulgaria	5	Morocco	1
Spain	5	Lebanon	1
Finland	5	Kuwait	1
Russia	4	Kazakhstan	1
Canada	4	India	1
Hungary	3	Thailand	1
Israel	3	England	1
Serbia	3	France	1
Sweden	3	Colombia	1
Ukraine	2	United Kingdom	1
Italy	2	Australia	1
Greece	2		

Any other business