GLOUCESTER AMATEUR RADIO & ELECTRONICS SOCIETY

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RAGCHEW

APRIL 2020

FROM THE EDITOR

We are living in extraordinary times, and the country is facing a crisis unprecedented in peacetime. Obviously our first priority is to family, also friends and neighbours, particularly the frail and elderly. Technology which didn't exist a decade or so ago enables local communities to quickly establish lines of communication so that nobody "falls through the net".

Communication is of course at the heart of our hobby and in the absence of our regular meetings at Churchdown School, our various club nets are providing a vital role in maintaining contact with members. Many thanks to those who act as net controllers also to all those who take part in keeping the "club spirit" alive.

With our meetings suspended, I will endeavour to produce "Ragchew" on a monthly basis so more than ever I need your contributions. Many thanks to those who responded to my plea in last month's issue.

Members will have been saddened to learn of the untimely death of **Barry Allen M6UBJ.** Barry (Bazza) made many friends in the club and his jocular banter at our meetings will be sorely missed. We offer our condolences to his family.

In this issue **Richard M0HNK** continues with the concluding article on his VLF receiver up-converter.

Tom G3XMM describes another Morse key in his collection, this time a World War 2 type J38.

Mike G4IZZ has responded to my appeal for an article on taking part in the UKEICC series of contests. Many thanks Mike!

Welcome and thanks to John 2E0POE submitting his first article to "Ragchew", describing the Ubitx V Multiband QRP transceiver which he has recently built. Part 1 in this edition.

Malcolm G6UGW continues his series reviewing the Radio Spectrum from 300Hz - 300GHz and this month he describes the Very Low Frequency Band 3kHz - 30kHz.

Our trip to Lundy in early March (how long-ago that seems) was a low-key affair, but I did manage to get on-the-air, with interesting results on 70cm

Stay safe, stay well!

73 Brian G4CIB (g4cib@outlook.com)

May "Ragchew"

As mentioned in my leader column, I plan to produce "Ragchew" on a monthly basis for the foreseeable future. Obviously I need plenty of material and articles so it's the usual plea. The deadline for the next issue is **Sunday 19th April.**

Copy can be emailed to me **g4cib@outlook.com** or posted to my home QTH:

"The Larches"
2 Poolhay Close
Corse Lawn
Gloucester
GL19 4NY

Radio 4 - again!

I know I have mentioned my addiction to Radio 4 before in "Ragchew" but as I'm typing this I'm listening to **"More or Less"** giving a fascinating insight into the risks and statistical analysis of the current coronavirus pandemic. Worth a listen on BBC iPlayer - the programme was broadcast on Wednesday 25th March

Contest Roundup by Brian G4CIB

Members continue to support the **UKAC** series of VHF contests and as we approach the end of March the club is in **21st position** in the Local Clubs table. In the **144MHz FMAC** Local Clubs table we are currently in **9th position,** and in the **432MHz FMAC,** also **9th position.**

In the **80m Club Championship** the club is well up the Local Clubs table, in **8th position** out of 42 clubs listed.

On a more general note, the RSGB have issued the following notice:-

"From RSGB HF Contest Committee and VHF Contest Committee. Update (24/03/2020) to the recent Rule Changes: As a result of the Government's updated position on people's movements, the VHFCC and HFCC have taken the decision that, until further notice, we can no longer allow any entries from stations operating from portable or alternative addresses or from multi-operator stations. Single operator entries from shared stations will also not be accepted unless the station is being shared by family members living at the same postal address."

As this issue is going "to print", the RSGB is consulting on the possibility of daytime weekday contests.

Building the Ubitx V6 Multi Band QRP Transceiver

In February 2020 I ordered a Full Transceiver kit from India

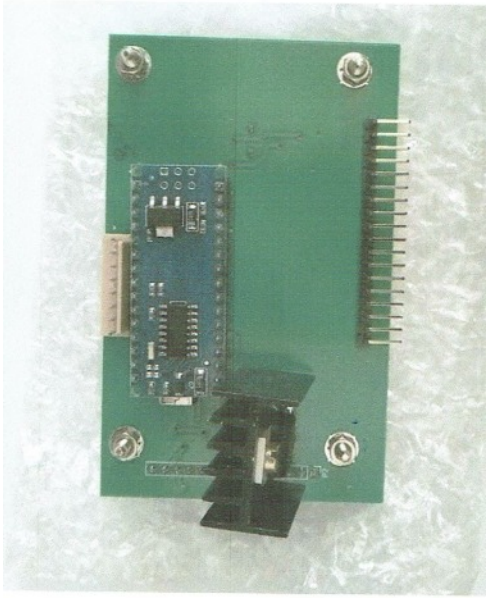
Designed by Ashhar Farhan VU2ESE. www.hfsignals.com

The full kit including the outer case costing around £180 with postage via India Post.

The kit arrived in around 12 days which is pretty good considering it has travelled all the way from Asia. Unboxing the Well packed kit you will find everything you need to build a Multi Band Transceiver covering all bands from 80m to 10m it will even cover 12m & 11m if you enter the frequency you want via the Frequency touch screen button.

No Soldering is Required to build the Ubitx V6 Screw together plug in a few wires and off you go ready to transmit Bobs your Uncle. This kit I would say is suitable for all licence holder levels from the Foundation, Intermediate to the Full. Though as it is a Amateur radio kit there is room to make alterations to the Transceiver adding RF Gain and other Gadgets for the More Advanced Licence holders.

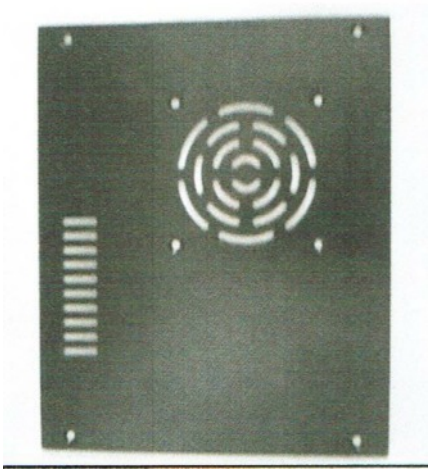
Mic, Knobs, Tuning Pot USB Cable, Optional Cables for advanced upgrades, Rubber feet, Power connector for wiring up a power supply.



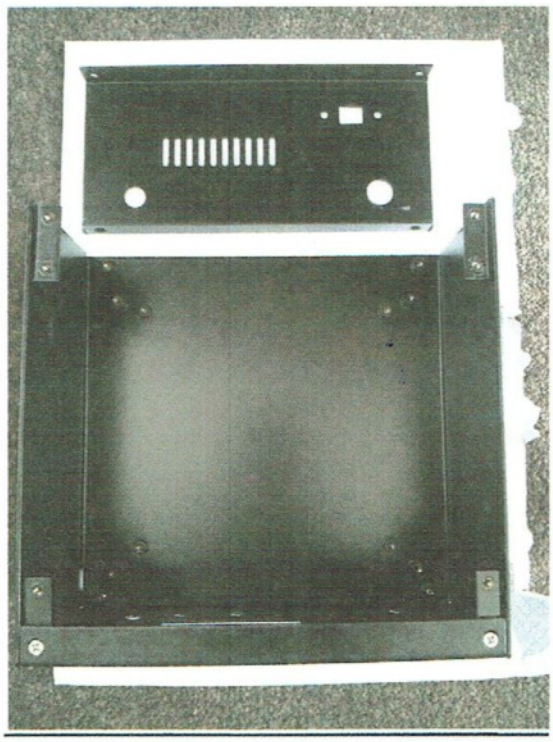
Raduino

(Arduino)

Speaker & Colour Touch Screen

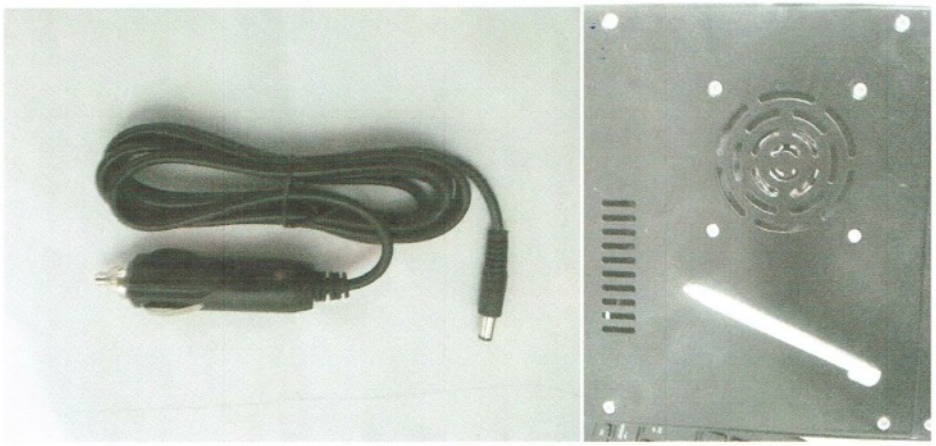


Main Ubitx Mother Board



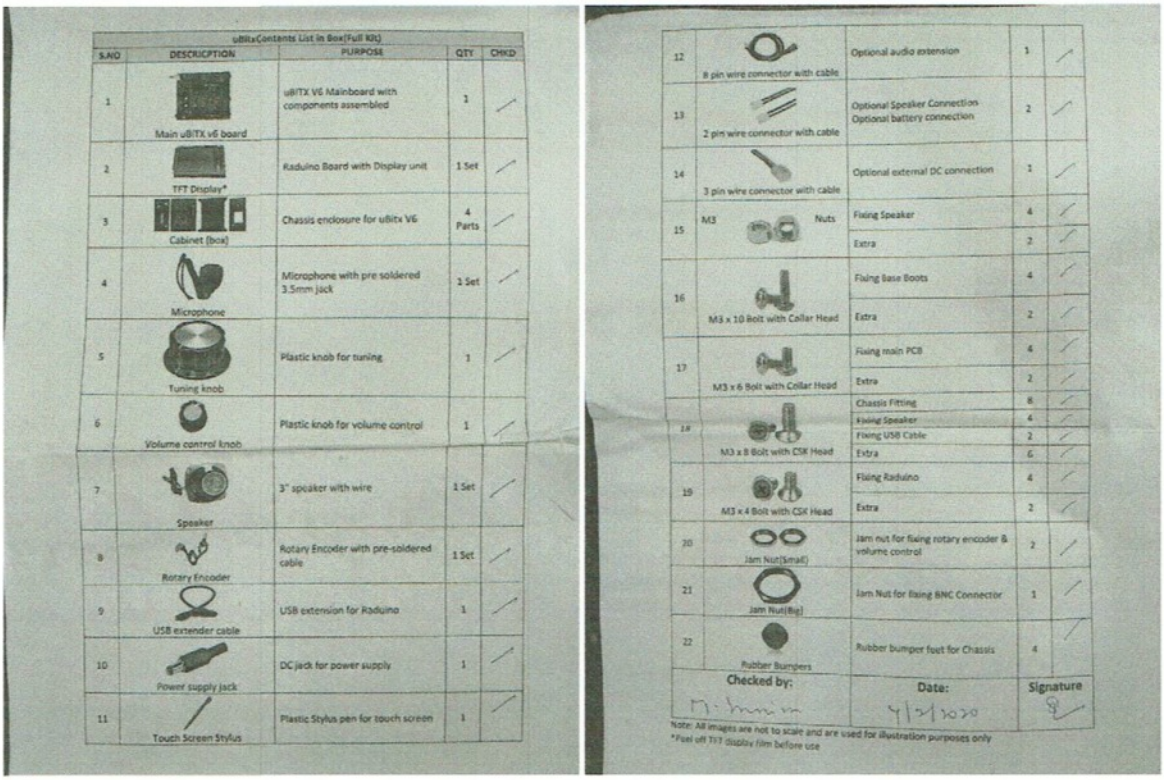
Nuts & Bolts, Outer Case

I also ordered a fused Power lead from Amazon to Power the Ubitx Making it Portable allowing me to use it mobile. Oh it also comes with a plastic stylus for the touch screen in the Ubitx kit.



Now with the Unboxing complete let's get down to putting the Ubitx together.

With the kit you should have a list of parts Supplied use this as a Guide to bits.



uBitx Contents List in Box(Full Kit)

S.NO	DESCRIPTION	PURPOSE	QTY	CHKD
1	Main uBITX v6 board	uBITX V6 Mainboard with components assembled	1	
2	TFT Display*	Raduino Board with Display unit	1 Set	
3	Cabinet (box)	Chassis enclosure for uBitx V6	4 Parts	
4	Microphone	Microphone with pre soldered 3.5mm jack	1 Set	
5	Tuning knob	Plastic knob for tuning	1	
6	Volume control knob	Plastic knob for volume control	1	
7	Speaker	3" speaker with wire	1 Set	
8	Rotary Encoder	Rotary Encoder with pre-soldered cable	1 Set	
9	USB extender cable	USB extension for Raduino	1	
10	Power supply jack	DC jack for power supply	1	
11	Touch Screen Stylus	Plastic Stylus pen for touch screen	1	
12	8 pin wire connector with cable	Optional audio extension	1	
13	2 pin wire connector with cable	Optional Speaker Connection Optional battery connection	2	
14	3 pin wire connector with cable	Optional external DC connection	1	
15	M3 Nuts	Fixing Speaker	4	
		Extra	2	
16	M3 x 10 Bolt with Collar Head	Fixing Base Boots	4	
		Extra	2	
17	M3 x 6 Bolt with Collar Head	Fixing main PCB	4	
		Extra	2	
18	M3 x 8 Bolt with CSK Head	Chassis Fitting	8	
		Fixing Speaker	4	
		Fixing USB Cable	2	
		Extra	6	
19	M3 x 4 Bolt with CSK Head	Fixing Raduino	4	
		Extra	2	
20	Jam Nut(Small)	Jam nut for fixing rotary encoder & volume control	2	
21	Jam Nut(Big)	Jam Nut for fixing BNC Connector	1	
22	Rubber Bumpers	Rubber bumper feet for Chassis	4	

Checked by: M. Imran | Date: 4/2/2020 | Signature

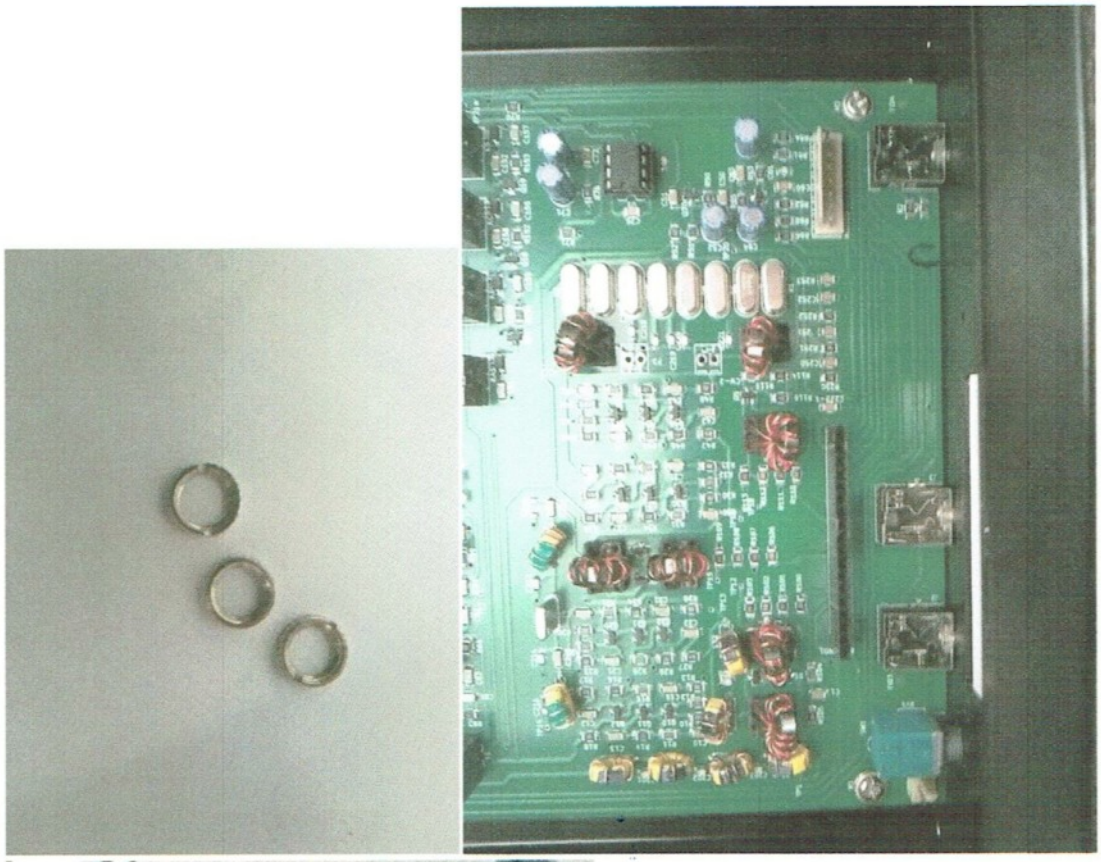
Note: All images are not to scale and are used for illustration purposes only
*Peel off TFT display film before use

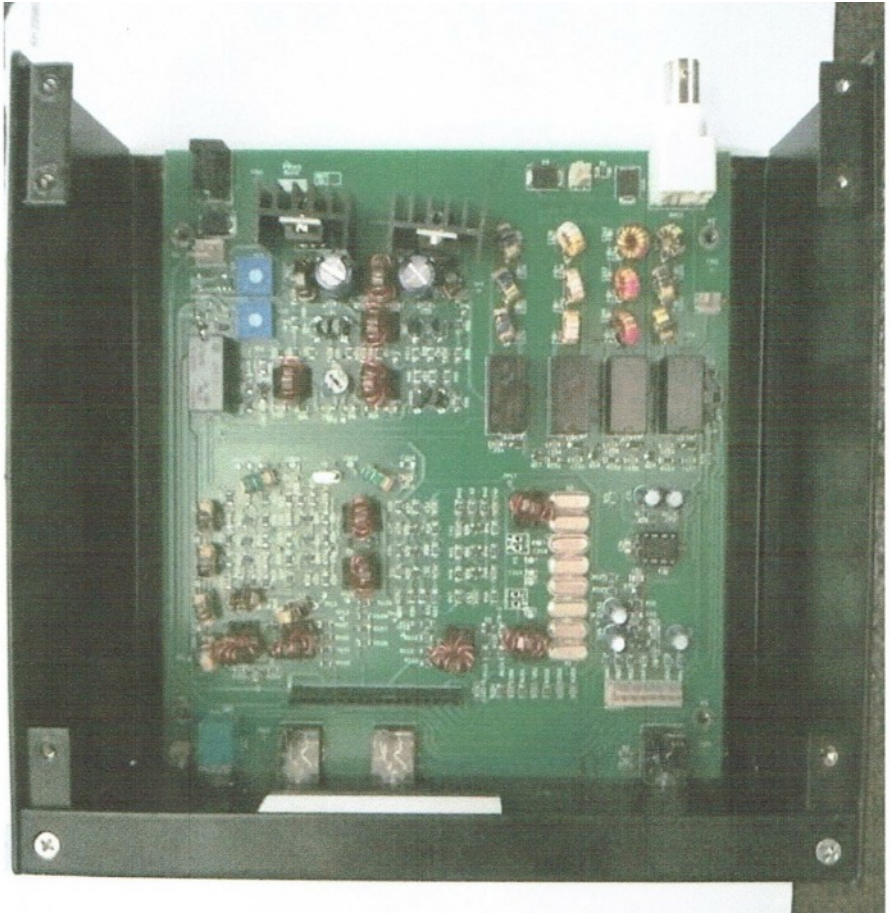
1) **I started construction with the Base of the outer case by attaching the 4 rubber feet or base Boots to the bottom of the case using 4 of the longest screws M3 x 10 with a Philips screwdriver Just push through the rubber Boots as shown and screw to the base of the case see pictures below.**

2) **Mounting the Ubitx mother board inside the Case.**

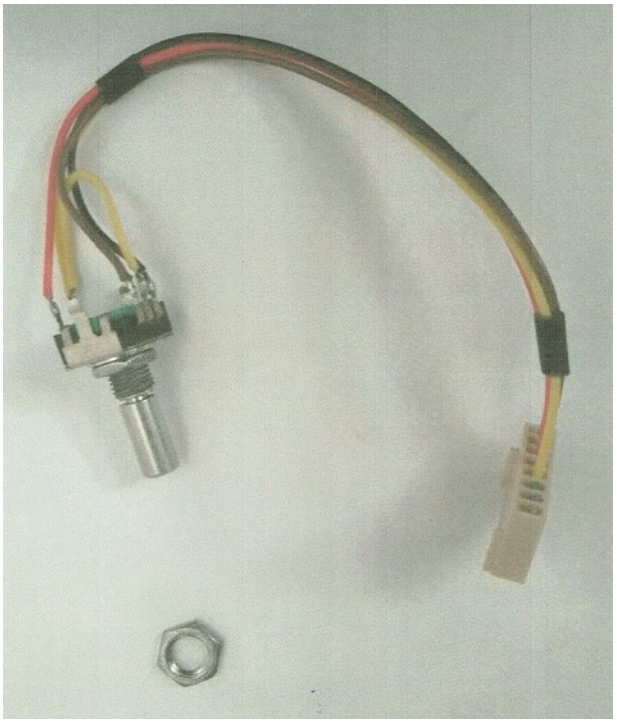
First remove the 3 nuts on the mic, earphone & keyer sockets

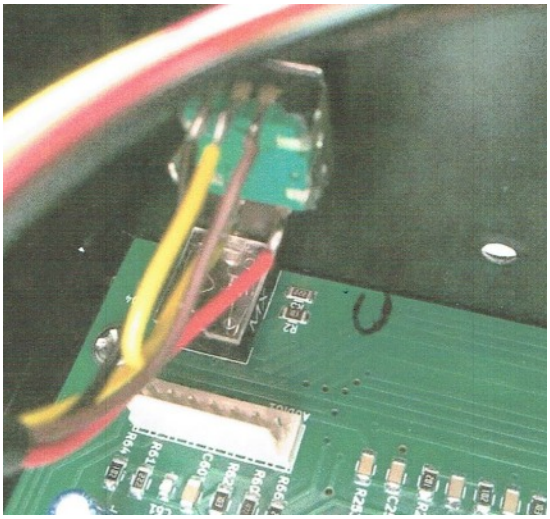
Place the board with the Sockets facing the front panel through the corresponding holes in the front on the case you will notice as I did that the thread of the volume control does not seem to go through the hole enough to attach its fixing nut? Think this is a Design fault but you get to keep a spare nut out of it for other projects Lol. Using the 4 M3 x 6 bolt with collar head screw down the mother board in place then screw back on the 3 collar nuts back on the Mic, earphone & keyer sockets on the outside of the case via use of a small flat screw driver with the side of the collar nuts with the grooved side facing out be careful not to slip the screw driver or you will damage the paintwork of your Ubitx case. See Pictures below.



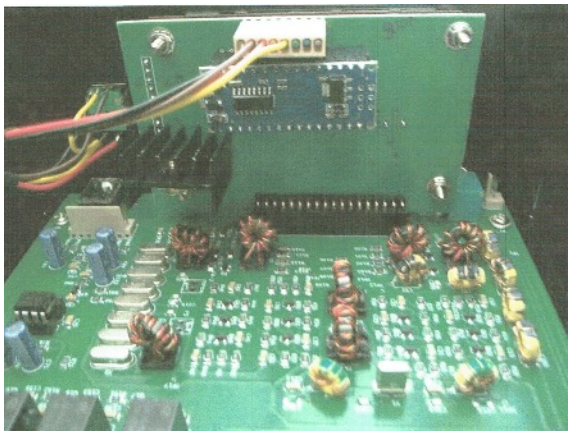


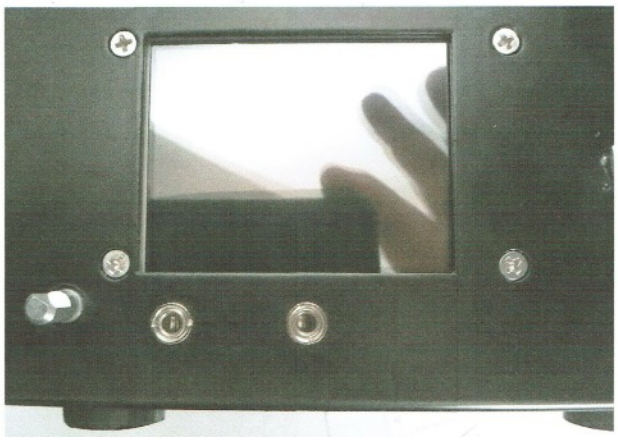
3) **Next mount the Tuning pot to the case front from inside the case poke the tuning pot knob pole through the hole provided and fix it in place using the nut provided with the bag of fixings do not remove the one that is already on the pot as this acts as a spacer inside the case where it is mounted. Be careful not to scratch the case when tightening the nut with a spanner or pliers depending on the tools you have i used a pare of small Pliers. See Pictures Below.**

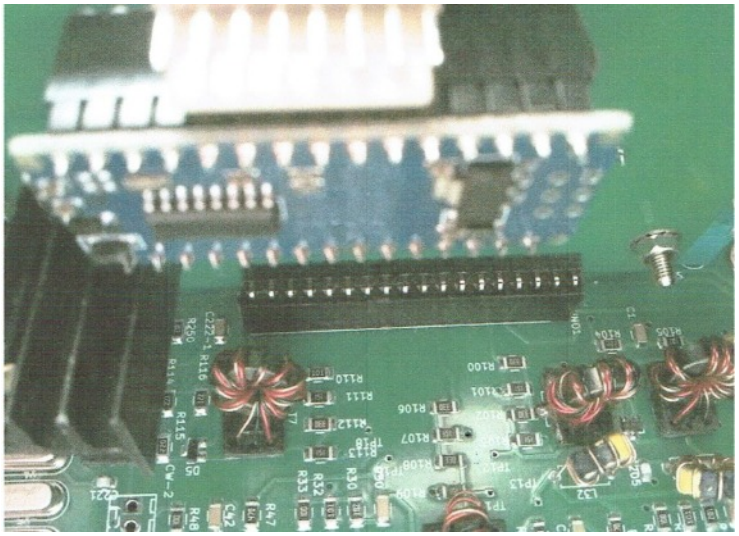




4) Next install the Touch Screen & the Raduino . Remove the protective sheet cover from the screen. Carefully insert the 16 pin black connector of the screen in to the Ubitx 16 pin socket ensure you have all the pins correctly in there corisponding holes in the socket. Using the Smallest 4 screw bolts M3 x 4 Bolt with CSK Head screw the screen in place through the front panel of the Case. Next plug in the Tuning pot cable in to the 8pin socket on the Raduino at the top on the back of the screen. Make sure you have the 8pin connector up the right way the black cable should be on your left as you face the back of your Ubitx. See pictures below.





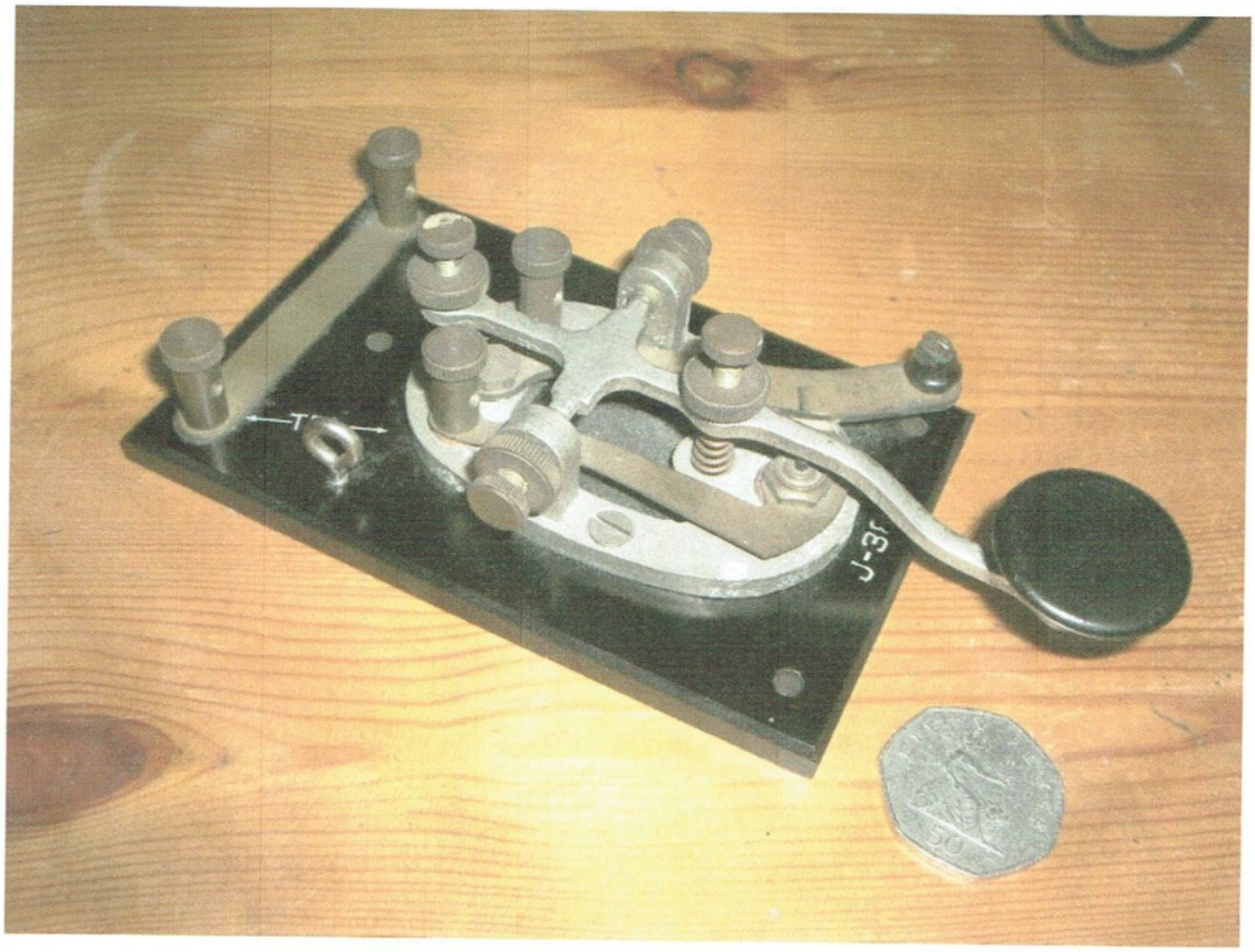


(To be continued next month - the final assembly)

John 2E0POE

Mr BUNNELL'S TRIUMPH -Part 1
by Tom G3XMM

It started with a club-night discussion about a J38. This sounds as if it could be some bureaucratic document but it is in fact a telegraph key. A rather well-used example has been lurking in one of my cupboards and is shown in the photograph below.



During the 20th century U.S. Signal Corps telegraph keys were given a "J" designation ranging from J2 to J51. Some of these keys are quite rare or even non-existent but one that isn't is the J38. It is fairly common on this side of the Atlantic but it was, and perhaps still is, available by the the tub-full on the other side of the pond. Having said that one should not assume that it is cheap and nasty. It is a nice responsive key produced for a specific purpose during the World War II period and came as part of a telegraph training kit. It consists of a key mounted on a black Bakelite-type base specific to its training role. If we imagine the key lifted clear of this base we have a design similar to other keys of the period. Of particular note is the one-piece lever, trunnion and pivot arrangement. This enables the ancestry of this type of key to be traced back to a patent granted in the U.S.A. tn 1881. Details of this and of the events surrounding it will be dealt with in the second part of this article.

UKEICC Contesting
by Mike G4IZZ

Although I try to enter whatever RSGB contests I'm able to, it's not always convenient so I tend to focus on the H.F. ones (usually CW). For me, the shorter the contest the better, inasmuch it doesn't take me away from other family stuff. With this in mind, I decided to have a bit of a change, and thought I'd have a go in the UKEICC (UK & Ireland Contest Club) contests as they offer regular 80M contests of just one hour's duration. But before this, I thought I'd have a go in one longer event (just this once) and entered the UKEI DX CW Contest over the weekend of 22/23rd Feb, which is offered as either a 24-hour or 12-hour event: I chose the 12 hour one. Of those 12 hours, I reckon I actually sat at the rig for a total of about 4 hours. It started well enough; however things don't always run as smoothly as we hope they will, and when my logging program suddenly started ignoring duplicate calls, I knew that for me, the contest was over. I won't bore you with the details but after exchanging e-mails the following day with the program's author, it was all sorted. It was rather odd because, being a MAC user, I use that particular program (SkookumLogger) for all my contesting (there are not many logging programs out there for MACs), and I've never had a problem before. I won't tell you who's fault it was, as it could embarrass me!! Anyway, I enjoyed what I did, working 132 contacts, and coming 204th out of nearly 700 participants.

So, getting enthusiastic, I entered another UKEI. This time, another CW contest a few days later, and solely on 80M, on Wednesday 26th Feb. This time, the program behaved flawlessly, but my endeavours were not well rewarded. As I said before, this contest was only one hour long, but I found hearing many of the competitors very difficult, apart from a few who were booming in. I guess it's all about antennas. I use what's called a 'HyEndFed' Long Wire for H.F. which works fine for European stations, but doesn't drag in the UK ones very well. Or at least, it didn't during that particular contest, and I managed only 22 contacts. But then again, I'm getting on a bit, so it just might be something to do with my hearing!!
The competitors seem a friendly bunch (well, they're very polite) and I didn't hear any impatient behaviour when someone took a while to get their details across. Not that there were many details to send – there's no requirement for RST or serial number to convey – just one's basic locator square (i.e. IO81, not IO81XX).

On Wednesday 4th March, I was ready for the next one, but this time, I had a go at the 80M SSB. I made sure I was in the shack ahead of time, did a bit of prep', and ensured my logging program was working properly. We were cooking on gas now (well, almost). I was running 100 watts again, the band was buzzing and I could hear lots of contest stations, but as before, not having an ideal antenna for inter-G, I often had to wait if there was a queue for a loud 'CQ' station. On the other hand, I got into the EU stations pretty easily. I logged 32 stations in the hour-long contest, and came 19th out of 44.

Anyway, these short UKEI contests run through the year, and I plan to enter as many as I can. At least, I don't have any great totals to try and beat. Oh, and I should add, the contest organisers make a plea for check-logs, so anyone who'd like to dip their toes in contesting might like to make a start by logging half a dozen or so contacts, and submitting them as a check-log. That way, you don't appear in any results tables. All the info is on their website, which is: https://ukeicc.com/index.php. or come and chat to me in the club if you'd like more information.

Editor's note - since we are not meeting at club, I will be pleased to forward any requests for further information to Mike G4IZZ. Email me at g4cib@outlook.com

Radio Grimeton and building a VLF upconverter - Part 2

By Richard M0HNK

Oscillator

A recycled temperature controlled 10 MHz crystal oscillator (Isotemp OCXO 131-191) was used for the upconverter oscillator. The datasheet indicates that it has an output impedance of 50 ohms and an output level of typically 8 dBm, just about perfect for driving the mixer directly. The phase noise is low, being given as 150 dBc/Hz at 1 kHz. The output from the oscillator is shown at Figure 9 (frequency domain) and Figure 10 (time domain).

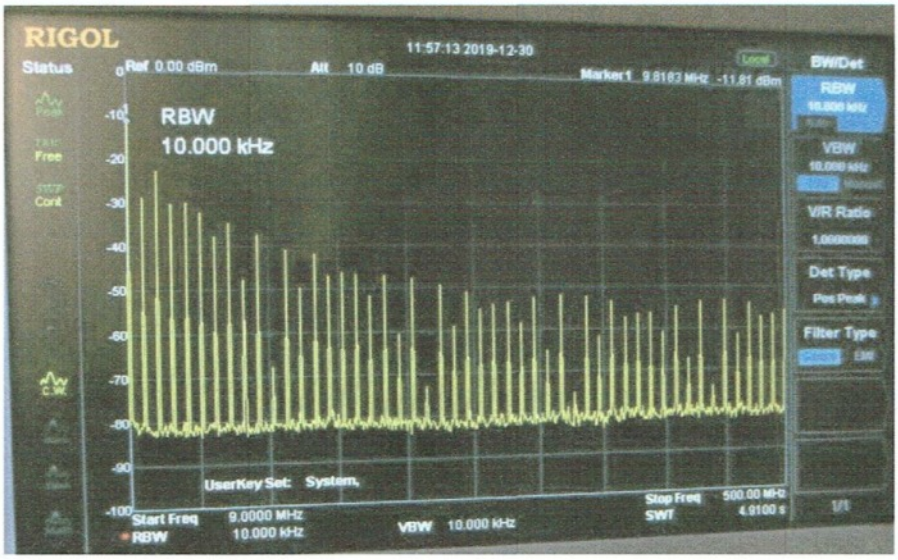


Figure 9: Output of TCXO, swept by spectrum analyser from 9 MHz to 500 MHz. The comb of harmonics is actually clearly visible in a wider sweep all the way out to 1 GHz. An external 20 dB attenuator was used for this measurement.

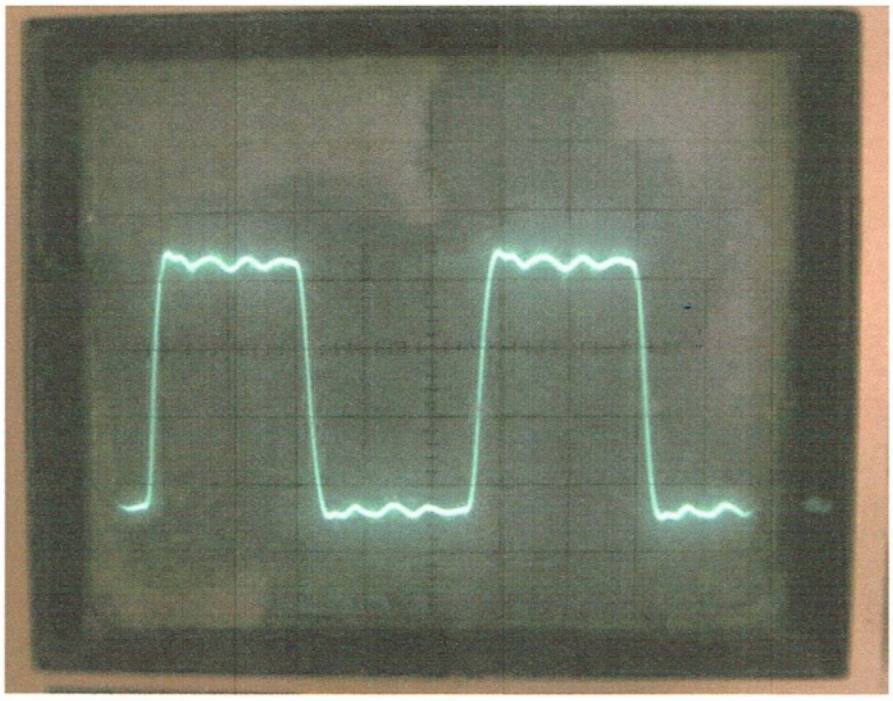


Figure 10: Output of TCXO on oscilloscope.

The output level measured at 10 MHz was 8.1 dBm so it should do perfectly well for a level 7 mixer. The square wave output is also suitable and should lead to rapid switching and reduced mixer losses compared with the mixer being driven by a sine wave. It does, however, raise the question of what happens at the mixer output. The output should be terminated in 50 Ohms in order to avoid signals being reflected back to the mixer port. In the present case, a broadband termination of up to 1 GHz will be required because the frequency components up to around this frequency will be sufficiently strong to pass straight through the mixer, emerge at the output and perhaps make a nuisance of themselves. Initial investigations were directed towards a diplexer after which it was decided to use a MMIC amplifier instead (see overleaf).

Diplexer

The object of the diplexer following the mixer would be to allow the wanted output frequency (around 10 MHz) to pass through and onto the next (50 Ohm) stage with minimal attenuation whilst 'dumping' the unwanted higher and lower frequencies out of harm's way into a resistive 50 Ohm load. Thus the mixer would 'see' a 50 Ohm load at all relevant frequencies but only the wanted frequency would pass through to be amplified by the following stage. I wanted to use junk box components wherever possible and I only have very few surface mount components. It seemed doubtful that a very satisfactory diplexer could be built for frequencies all the way out to 1 GHz using through-hole components, but this approach was nevertheless investigated. For this, a simple bridged tee design was adopted, with centre frequency of 10 MHz and Q=10.3 (to suit the larger polystyrene capacitor which was to hand). A schematic is shown at Figure 11 and the diplexer as built at Figure 12.

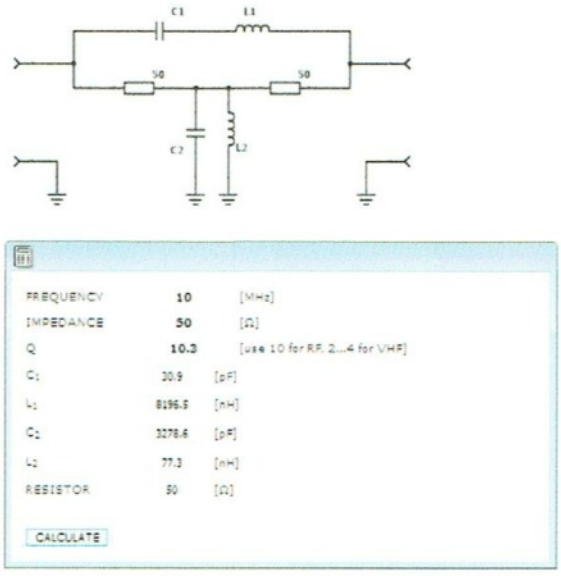


Figure 11: Diplexer design (using software at https://www.changpuak.ch/electronics/calc_16a.php)

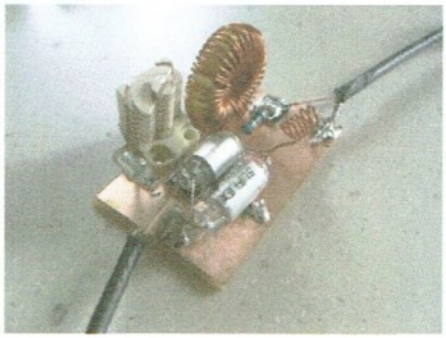


Figure 12: Diplexer circuit as built (with test attachments).

The diplexer circuit was then swept using a DG8SAQ Vector Network Analyser (Figure 13). The diplexer functions well at HF and low VHF but, rather as expected, it does not show a good 50 Ohm termination (centre of Smith Chart) across a sufficiently wide frequency range. Instead, the impedance trace (red) looks more like a plan view of a drunkard trying to find his way back home

after a heavy night out. It takes us on a Grand Tour around the Smith Chart.... The S_{21} (through) trace (blue) shows a satisfactory pass characteristics at 10 MHz (the peak near the extreme left) and good suppression on higher HF and low VHF, but also shows a marked deterioration at higher frequencies. I therefore ditched the diplexer idea and a different approach was adopted.

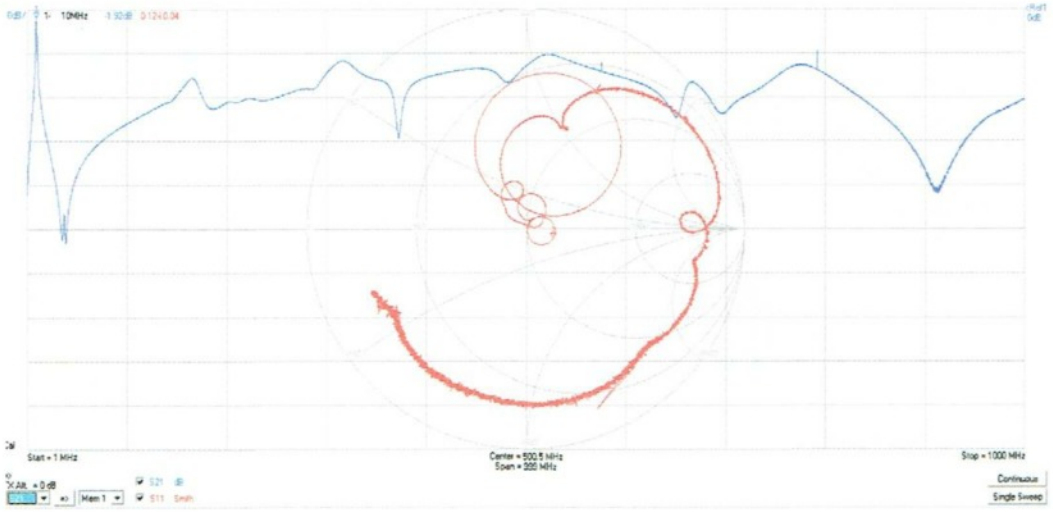


Figure 13: Diplexer test (blue trace showing insertion loss and red trace showing impedance on Smith Chart). Swept from 1MHz – 1 GHz.

Post mixer amplifier

Instead of using a homebrewed transistor amplifier that provides a 50 Ohm input impedance over a fairly narrow range of frequencies and 'dumping' the other frequencies into the resistive loads of a diplexer, I concluded that using a MMIC (monolithic microwave integrated circuit) would probably be a better approach. Depending on the device, these can offer a good 50 Ohm match from DC up to several GHz. I had a few GALI-74+ MMICs which do just this from DC to 1 GHz and therefore cover the range of frequencies involved here. The circuit is shown at Figure 14. Three parallel capacitors were used on the input (47 µF electrolytic, 1 µF polystyrene and 1 nF surface mount) to allow for the wide range of frequencies to be passed. From the datasheet, a resistor of 90.9 Ohms is required in the 12V power supply line to give the correct biasing. This was achieved (more-or-less) with two 180 Ohm resistors in parallel. The amplifier gain at 10 MHz was measured at 25 dB which is more than necessary, so this was reduced a little through the use of a 4dB 50 ohm pi attenuator pad on the output.

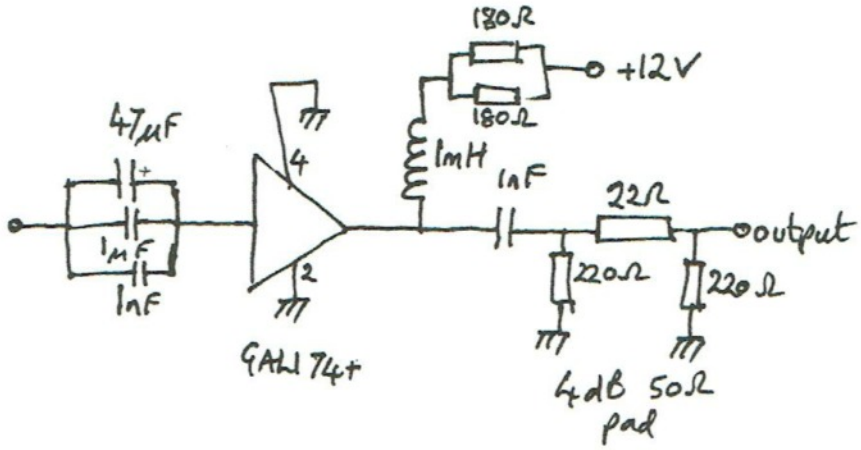


Figure 14: Post mixer amplifier using GALI-74+ MMIC.

10 MHz Bandpass and notch filter

The bandpass filter was easy, the circuit being taken directly from a proven design sold as a kit by Hans Summers (QRP labs). It is a transformer-coupled double-tuned circuit designed for 50 Ohm terminations. I already had a 4 dB 50 ohm pad on the input side (the one which terminates the MMIC – see previous section) and I terminated the bandpass filter in another 4 dB pad. I homebrewed the filter since I had suitable parts in the junk box. The insertion loss of the filter alone (ie without accounting for the attenuator pads) was measured as 0.85 dB (Figure 15) and the 3dB bandwidth close to 1 MHz.

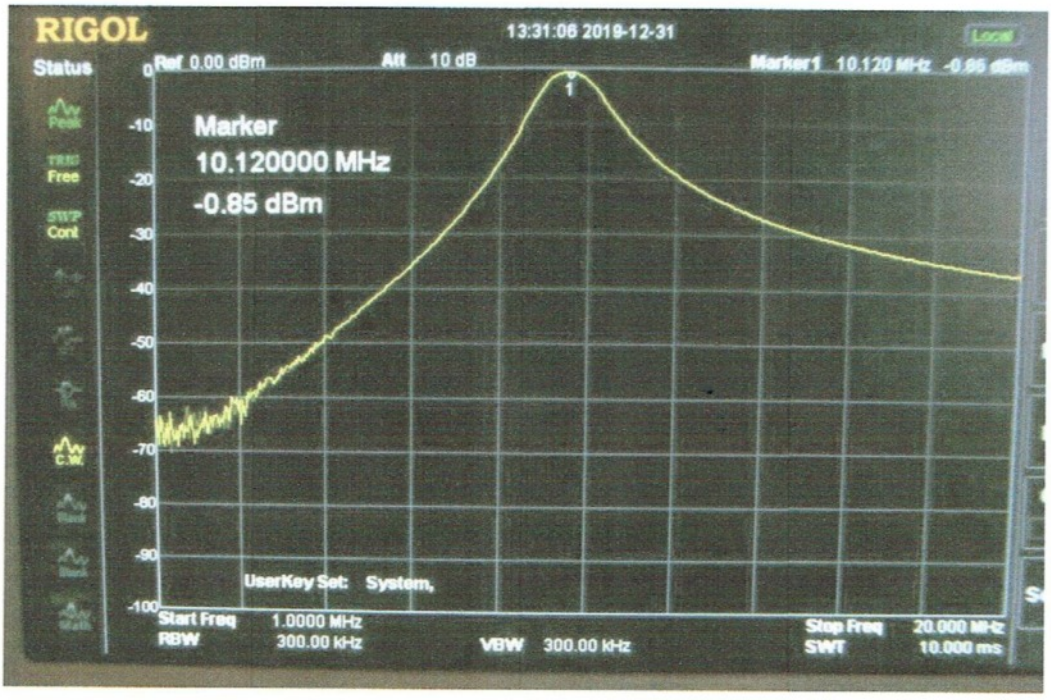


Figure 15: Response of 10 MHz bandpass filter, swept from 1 – 20 MHz.

To minimise the relatively loud signal from the 10 MHz crystal oscillator appearing at the output of the upconverter, I decided to implement a notch filter – a 10 MHz crystal in series with a 3.3 µH inductor and a 60 pF trimmer capacitor (to allow fine tuning) - to follow on from the bandpass filter and to suppress unwanted oscillator signal. Initially I followed a design I had seen online (ref 2) where a crystal notch filter was sandwiched between a 50 Ohm pi attenuator (which also followed a MMIC amplifier, exactly like the approach followed here) and the 50 Ohm input to the receiver. I found that this had a mediocre performance with only 6.9 dB of attenuation at the frequency to which it was tuned. I reasoned that this was probably due to the low impedance environment around the notch filter (since the 50 Ohm input to the receiver would appear in parallel with the crystal notch circuit and the latter might have an impedance of somewhere around 20 Ohms based on my measurements of the Rs of other crystals plus a bit of resistance for the inductor and capacitor). I therefore wound two 11:2 transformers on binocular cores of type 43 material, the 11 turns being the most I could get on the core with the thickness of wire I had, having decided that two turns would be necessary on the primary (5.5 µH inductance with two turns providing enough reactance, based on the guideline of 5-10 times reactive impedance of the resistance appearing in parallel to the winding). At the input to the 2 turn winding, there is the 4 dB 50 Ohm pi attenuator pad which follows the bandpass filter and I placed another 4 dB pad on the output 2 turn winding of the second transformer. So the two transformers simply transform the 50 Ohms input up to around 1.5k and then from 1.5k back down to 50 ohms again. And within the 1.5k Ohm environment I placed the notch filter. The result was much better – nearly 30 dB of attenuation at the tuned frequency (Figure 16). I expect that yet better performance might be achieved with a greater turns ratio, but this would require me to get thinner wire or larger binocular cores and I wanted to use what I had.

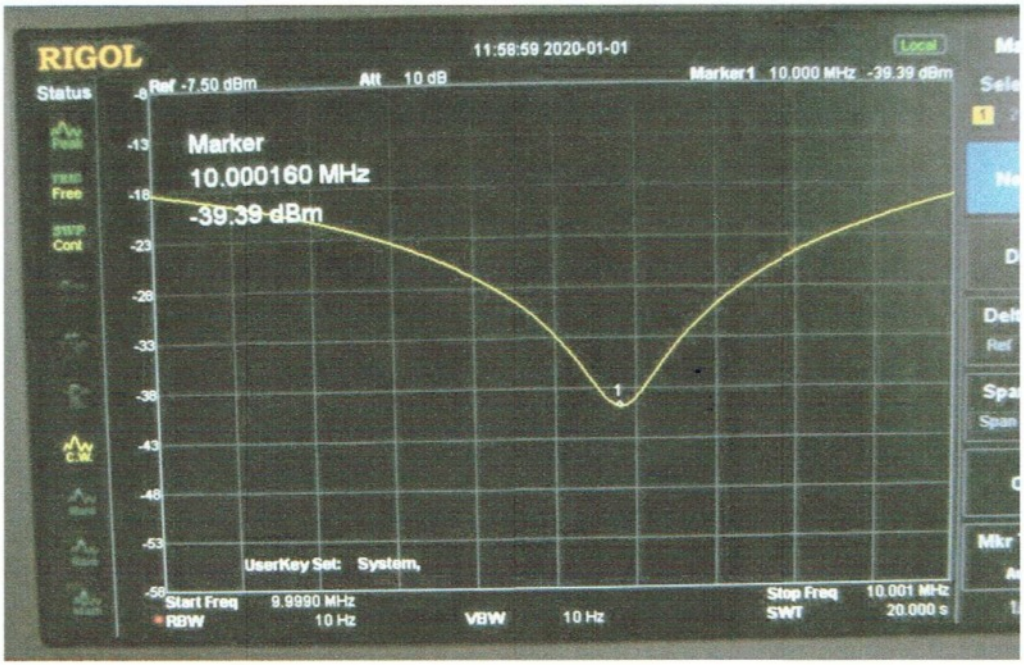


Figure 16: Bottom of crystal filter notch (-39.4 dBm) swept over 2 kHz range. Away from the notch, the level of attenuation (caused by two 4 dB pi attenuator pads plus the transformer losses etc) was -9.5 dBm so the attenuation at tuned frequency arising from the notch filter itself was 29.9 dB.

Whilst providing around 30 dB of attenuation at the centre frequency, the notch filter causes only about 8.5 dB attenuation at 1 KHz from the centre frequency and has minimal effect beyond about 3 kHz away from it. A schematic of the band-pass filter, attenuator pads and notch filter is shown at Figure 17.

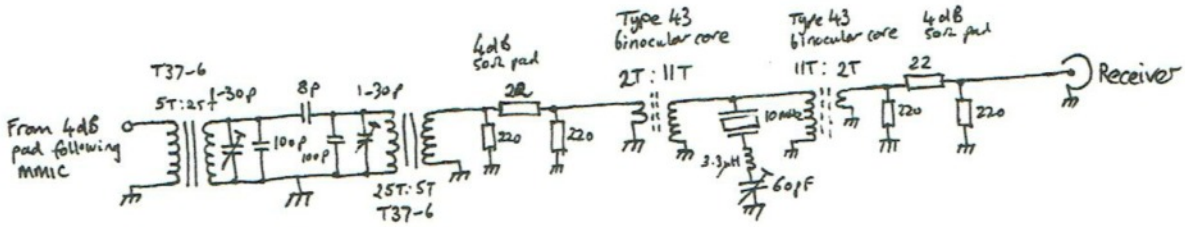


Figure 17: Schematic of band-pass filter, attenuator pads and notch filter.

Testing

Initial on-air testing with a wire antenna seems very successful, using my Elecraft KX2 as the receiver. Many signals (including some strange ones around 18-23 kHz which may represent military communications with submarines) were heard on the morning of 27/1/20. The upconverter was also hooked up to the spectrum analyser and a representative 'slice' of the spectrum that morning is shown at Figure 18.

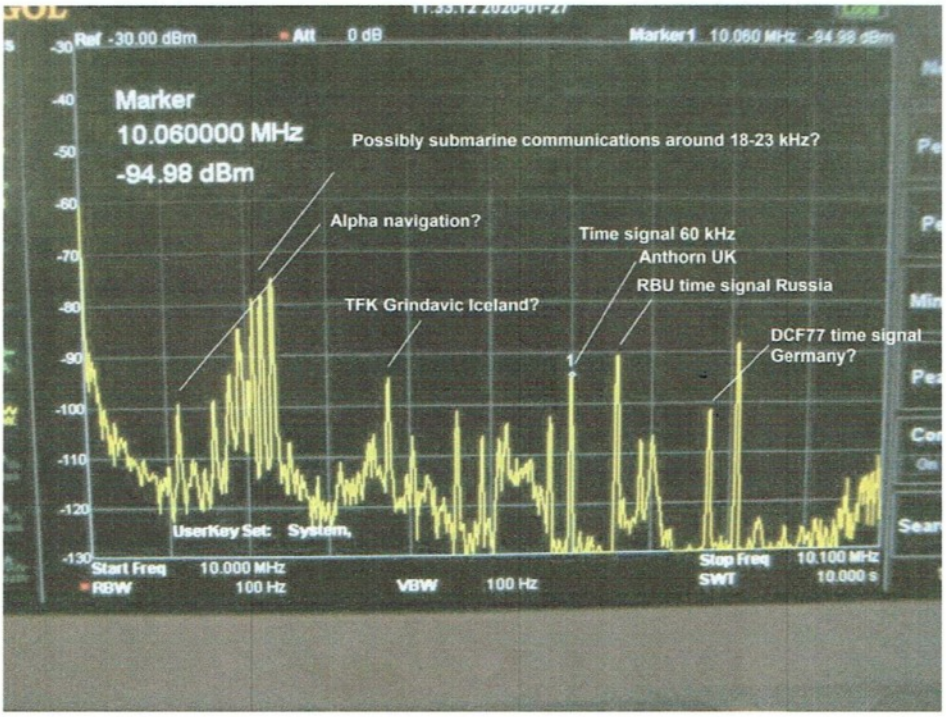


Figure 18: Tentative identification of some of the VLF signals detected on 27th January 2020 (derived from various online lists of transmitters including the Wikipedia VLF page).

When the wire antenna was unplugged from the upconverter but the upconverter was still switched on, the noise-floor fell away. This strongly suggests that internally-generated noise in the upconverter and noise in the receiver (spectrum analyser and also Elecraft KX2 receiver) are not the limiting factor.

In terms of the design criteria I started out with, they seem to have been met reasonably well. The upconverter certainly now allows me to investigate part of the radio spectrum that was previously inaccessible to me. There may be a case for adding some more attenuation either after the push-pull amplifier or at the RF input to the mixer (or both) since investigation so far suggests that external noise is strongly dominant and attenuation would provide a more solid resistive termination to filter and mixer whilst not impacting on noise figure. I'll wait until I've investigated further in a more rural and lower noise environment, however, before making any changes here. But there's still the acid test – Radio Grimeton. For that I'll just have to wait until Alexanderson Day 2020.

References

1. Complementary push-pull amplifiers for active antennas: a critical review. Chris Trask (July 2013), available at http://home.earthlink.net/~christrask/Complementary%20Push-Pull%20Amplifiers.pdf
2. http://www.giangrandi.ch/electronics/lwupconv/lwupconv.shtml

The Radio Spectrum

by Malcolm G6UGW

Part 2 - Very Low Frequency 3kHz-30kHz

These frequencies correspond to a wavelengths between 100 to 10km. Because of the ability of these waves to penetrate sea water, this band is used to communicate with submerged submarines. This part of the radio spectrum is also used for navigation and time signals.

RSGB Training Manuals

by Brian G4CIB and Leta G4RHK

We have the following books available for members who may wish to study during the next few months

Foundation Manual £4.50

Intermediate £6.50

Full £10.00

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G4CIB and G4RHK on Lundy

By Brian G4CIB

Our trip to Lundy started on a dull Monday in early March when small group of us assembled at Hartland Point in North Devon for the briefing for our helicopter flight to Lundy. The Flight Dispatcher carefully weighed everyone along with our luggage (10kg max) and with a lot of calculator key punching, pencil and paper scribblings, a few rubbings out, a seating plan emerged. Leta was nominated to sit in the front seat with the pilot and yours truly the passenger in the back with the headset ready to relay to the other passengers any instructions from the pilot.

The flight is quick and no sooner had we left the North Devon coast, Lundy came into view and we were quickly approaching the landing area. Luckily the island Marisco Tavern is a short walk from the landing area so lunch was the first priority. By mid-afternoon we were unpacking and settling into Castle Cottage on the south-east tip of the island.

Jim 2E0GKN had arranged a 2 metre SSB sked with us on the Tuesday morning. Weight restrictions had meant that I was not able to take an amplifier so I was relying on 5 watts from my FT817ND, also I only had a dipole so it was going to be interesting to see if we could make the contact. Jim and his friend Tom were located on Haresfield Beacon, and used an FT290R, an amplifier running about 35 watts and an HB9CV antenna. Signal reports were exchanged - Jim 5-6 on Lundy, my signals 5-3 at Haresfield Beacon.

On the Tuesday evening it was the **432MHz UKAC.** The antenna I used was an HB9CV - once again the luggage weight restrictions precluded me from taking a larger antenna. With 5 watts I managed just 5 qsos, all in different locator squares - 2E0VCC/P (IO70SP), G4RRA (IO80BS), M0BUL (IO82NG), G4ASR (IO81MX) and GW4MBS (IO71XW).

Towards the end of the week, the weather rapidly deteriorated and by the Thursday evening for the **50MHz UKAC,** the wind was up to Force 8/9. The 3/2 wave wire dipole survived for just one QSO with G4CLA in IO92JL

Our next visit to Lundy is scheduled for the end of June, but this looks increasingly unlikely that it will happen. So we will have to wait until next year for our next visit which is scheduled for 1st - 8th May 2021.

Ready to go! Leta G4RHK sat in the front seat, belted-up and waiting for take-off!

Photo by Dr Gabriele Schmidtlein.

2m dipole set up ready to work Jim 2E0GKN/M

70cm HB9CV ready for the March UKAC from Lundy

2E0GKN/M set up on Haresfield Beacon

Photo by Tom Bradley

Jim 2E0GKN/M in QSO with G4CIB/P

Photo by Tom Bradley