

Chairman: Derek Gillett G3WAG • **Treasurer:** Rodney Archard M0JLA • **Secretary:** Duncan James M0OTG
Committee: Nigel Hancocks G4XTF; Dave Porter G4OYX; Bob Bowden G3IXZ; Matt Porter G8XYJ Contest Captain;
Richard Langford G4FAD; Mike Bush G3LZM; Tim Bridgland-Taylor G0JWJ; Geoff Wilkerson G8BPN

Editorial

At the AGM, it was with great reluctance that the members had to say goodbye to Nigel Hancocks G4XTF, our Chairman of many years standing. Throughout his Chairmanship the Club has prospered in many areas and we now have many more willing members coming along to our meetings. Thanks Nigel.

The committee also has had to say goodbye to Dave M0RNI, who has decided to leave their ranks after many years of service to the Club. Of course, we shall see Dave at meetings and continue to seek his advice. Thanks David.

With best wishes, we welcome Derek G3WAG who has taken over the Chairmanship. Derek, like Nigel, is intent on keeping the Club healthy and prosperous. We know Derek has some new ideas to discuss and we all wish him every success.

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Recently, in ancient volcanic ash in Herefordshire, a crustacean fossil was discovered. It was dated to be 430,000,000 years old! and is reputed to be the earliest fossil ever found. More recently man has landed on the moon and earlier than that G3LZM taught himself the Morse code. For those of you wishing to learn this most fascinating and “nifty” mode of communication, see the teaching aid on page 10 by G4FON.

Ed



Merchandise

Great New Prices!

See page 12

VHF Field Day

The location for this event is Brown Clee Hill near the village of Burwarton (WV16 6QH) and will be held on the 1st July starting at 1500hrs, and finishing on 2nd July at 1500hrs; and is for 2M, 70cm and 23cm. However, the 6M session runs from 1500hrs 'till 2300hrs on 1st July and 4M session runs from 0900hrs 'till 1500hrs on 2nd July. Saturday & Sunday respectively.

A fee of £10 per person is payable to the Boyne Estate.

Note that parking availability is restricted at the site therefore people are requested to park at the village Parish Hall from where a shuttle service will operate to the site.

Our premium contact is Matt Porter G8XYJ.

Good Luck Everyone....Ed

Silent Key

It is with much regret that the *Journal* formally announces the death of Dave Hicks G8EPR.

Dave was keeper of the PYE Museum in Bewdley and was a very active member of the PMR fraternity. He had been in hospital for many months after a very serious ladder accident.



Photo from Pye Museum web site (www.qsl.net/gm8aob)

The HARS Club members, and its *Journal* readership, sends sincere condolences to his family and friends. He will be greatly missed.

Annual Report for Training at the Hereford Amateur Radio Society

As the HARS Training Co-ordinator I am pleased to report that again this last year it has been a successful period for training with significant achievements in Foundation, Intermediate and Advanced levels.

As a training team we had received earlier interest both via the Club website and informally from candidates and as such proposed to run FL Course No. 7 on 8th and 9th October 2016 but in the event after receiving, rather surprisingly, no applications to the calling notice this was cancelled.

All was not lost though as we then received two applications from Geoff Marfell and Mike Edwards, these were both electronics professionals and so it was decided to run a cut-down one day "Fast-Track" FL course for them on Sunday 30th October as we were able to skip quite a lot of the basic theory, concentrating more on the practical and the amateur radio-specific content.

In the event, Mike couldn't make it as he had a new job commitment so Emma Pardoe XYL of Club member Jez stepped into the breach as she had been studying for the FL anyway. This prevented Mike's paid-for application from being wasted.

On the day Geoff passed by a good margin but regrettably Emma ducked out by one mark! Undaunted, she was determined though to have another go.

Geoff was well-placed now as he wished immediately to go on an Intermediate course and we had already proposed IL Course No. 3 to be run over three Saturdays and a Sunday in November 2016.

There were four other candidates, including HARS members Richard Webb, Andy Gray with Graham Jacks and Neil Collins making a total of five. We were pleased when all passed, continuing our 100% pass-rate success on Intermediate.

The Training Team did not have much of a rest though following these achievements as

by now there had been a resurgence of new applications for a FL Course.

Accordingly FL8 was set up for 7th and 8th of January. Emma was on this along with Ben Doughty, Dave Faulkner, Ben Elms-Lester, Stephen Bunting, Declan Collins and Mike Evans. The regular Lead Invigilator Duncan M0OTG was unable to make this date so Dave Harris M0RNI came out of retirement to do the honours. In addition to the FL candidates, Dave also had to organise the "Advanced" exam for Geoff Marfell who had self-studied and took it simultaneously as the FL candidates were taking theirs. Rod M0JLA took the opportunity on FL8 to blood his RSGB Practical Training Authorisation and signed off all the practicals.

With all FL candidates passing, the team were elated and we have three more members of HARS. Geoff, M0OED is to be congratulated as he too passed and is now a Full licensee in just over three months from start to finish.

Enquiries continue to come in and we had FL9 planned for 22nd and 23rd April. This was be a slightly different course to normal as we had possibly up to three youngsters around 12 years old on the training as well as Ryan Ing, he of the HARS-sponsored weather balloon and some Air Training Corps cadets and their Officer Commanding Paul Higgins from Ewyas Harold Squadron. Paul is assisted in ATC Comms training at Ewyas Harold by HARS club member Ray Hill, G0IMV and Ray's grandson is also on this course.

It was unfortunate that due to unforeseen circumstances of a medical nature for my wife, Rod and I have decided to postpone FL9 and reschedule as soon as possible.

We have received an enquiry from Neville Wain, the Training Officer at the Birmingham HQ of Ofcom via one of our club members as they have seven or so young Ofcom apprentices who as part of their training are encouraged to obtain a foundation licence. Plans are being formulated to run FL9 or FL10

for them and possibly a few others to get to ten candidates.

In closing this report I must mention, name and thank all those in the Training Team. Since November 2013 we are approaching 60 or so passes in Foundation and the 13 Intermediate passes.

It would be impossible to run the courses without the significant input from Geoff G8BPN, who lets us run riot in his premises, his shack and VW Transporter for the practicals and also for the safety lectures.

Other valued Training Team members include Rod M0JLA, Nigel G4XTE, Rich G4FAD, Derek G3WAG, Duncan M0OTG, Bob G3IXZ, Matt G8XYJ, and retirees Stuart G4VMF and Dave M0RNI; rest-assured the Club could not run the courses without the whole team!

Dave Porter, G4OYX April 2017.

Submarine Comms

Stop Press!

Pat G3YFK writes to say how interested he was when reading Derek's splendid article on submarine communications in the last edition of the *Journal*. He goes on to say that much of the Criggion (Powys) and some Rugby equipment is on now display at the Bunker Museum in Nantwich. Pat says that Criggion (GBZ) operated on 19.6KHz until closing in 2003. It was notorious for its 600 foot towers!

There is more to come on sub comms'...Ed

www.hackgreen.co.uk



The Russian Duga

In 1976 amateur radio enthusiasts started to pick up signals that sounded like no other within the 4-30MHz frequency range. A transmission of pulses of varying rates between 10Hz and 40Hz blotted out many broadcasts and communications in the West. And, even airlines and telephone systems were affected.

This was the “over-the-horizon” early warning radar system invented by the Russians and called the Duga but became to be known as the “woodpecker” in the West.

Sited in Chernobyl (yes, the very place), it radiated 10MW of RF power and the receiving station sited 50km away, could detect missile launches from submarines in the Atlantic.

The Duga shut down finally in 1989. It was during its active period that noise/interference blanking circuitry and systems were developed.



Duga aerial

The Kent Hand Key

This beautiful key is engineered to the highest standard from solid brass. Trouble-free performance is achieved by the use of silver contacts and sealed bearing pivots. The polished wooden base is weighted for stability and is finished on the underside with a covering of green beige cloth. See www.kent-engineers.com.

Super, Ed



How Do You Get a Line Over a Tree?

Answer: USE A DRONE!

I have often thought about various methods of trying to get a supporting rope into a tree in order to hoist an aerial such as a dipole or an end feed wire. In the past I have used the heavy hammer on the end of a long light cord method. This tends to be a rather hit and miss process and usually requires a number of attempts before any form of success is achieved. Health and Safety would not approve of anyone whirling a heavy object around and launching it in the vague direction of the tree leaving all observers in considerable danger. Also, this method very rarely achieves the height required for producing an efficient antenna.

An alternate method I have used is to fire a crossbow bolt trailing a light fishing line. This tends to be a fairly accurate method and can place a line through the gaps in the tree canopy. However the bolt can travel for some considerable distance after passing through the foliage with some doubt as to what will stop it at the end of its travels.

One Christmas time whilst erecting the Xmas tree lights in a 30ft Christmas tree in the garden, and using the crossbow to put lines into the tree, I ended up with the bolt hanging over the 400kV grid in the middle of the neighbouring field. Fortunately the bolt was trailing nylon fishing line and so I was insulated from the electric current and the bolt was easily recovered.

These dubious methods of getting lines into trees made me think about using a drone that my dear brother had given me. It carried a fairly substantial camera which could easily be replaced by some form of towing arrangement. But, what were the limitations of the drone? How was the line to be attached and released? What would the effect be on the stability of the drone as it flew dragging a fishing line behind it? Would the considerable propeller down wash cause the line to behave in such away as to become entangled in the props? Well, the results and answers to these questions have taken me sometime to solve and happened more by accident than by design.

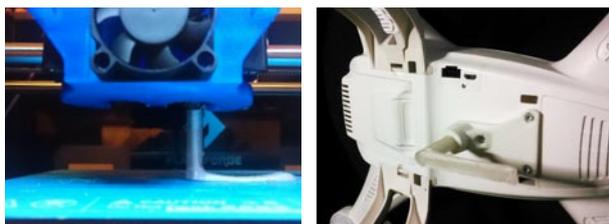
I did not want to use the drone given to me as it was rather valuable and if destroyed in any form of accident would render an expensive camera useless. I therefore searched Ebay to see what was going cheap in the second hand market. To my surprise a drone retailer had split up a new Chroma Blade set, which was identical to mine, and was selling the contents

as single items. He was offering the aircraft "bird" at a very reasonable price. It was also capable of binding with my controller which would make life very easy indeed. I purchased the drone less batteries, camera and radio controller.

A few days later I went through the process of trying to bind the "bird" to the controller after having watched a "Youtube" video on the method. However, I failed to bind the "bird" a number of times and was beginning to think I had got a dead budgie. However, I viewed the video again to find I had missed the most important part of the process which was to turn the "bird" upside down and upright again before starting the process of binding. All was well after and the drone was flown without the camera, which was a little nerve-wracking as there was no information on the drone status sent to the controller screen i.e, the bird was blind. My other Chroma Blade when flown with the camera sends live video pictures to the screen.

Having acquired the second drone, the next question to be solved was how to attach and release the fishing line. Various ideas came and went. I even purchased a cheap radio controlled relay system thinking that it could be used to activate an electromagnet to drop the fishing line tied to a steel washer. However while chatting with DAVE MORNIE and STUART G4VMF somebody mentioned gliders and towing lines, and from that a simple hook method was devised. So simple, it just required a hook to face forward which would force the line to the back while travelling forwards. To release the line, the drone would rotate through 180 degrees and continue travelling in same direction pulling the line off the hook.

What was now needed was a hook. I played around with strong copper wire but the structures were unprofessional in appearance and rather loose in fitting, and generally unsuitable. My youngest son had recently become interested in 3D printers and had just purchased one. I asked him if he would like to try to design and print a hook that could mount in place of the camera mountings, a challenge he took on willingly. The printer and hook being produced can be seen in the picture below.



The following picture compares the camera carrying and the modified drones.



A close up view of the hook on the drone A and one of the camera on drone B.



Flight Trials

The first flights with line attached used a short 6ft piece of Hi Viz cord weighted with six large washers to hold the line down to avoid any chance of it being lifted by the propeller downwash. This flight went very well and the aircraft handled normally.

When left to hover the drone was very stable and could be positioned with considerable accuracy. To test the release of the cord, the drone was then turned through 180 degrees and allowed to drag the washers on the ground which in turn, pulled the cord off the hook! This was followed by a test flight with fishing line attached to the washers. The fishing line was on the spool of a centre-spooled fishing reel and was able to be pulled off when the bail of the reel was released.

The Hi Viz cord was laid out in a U shape under the drone with the end with the washers and attached fishing line facing the stern of the craft. This allowed the drone to have some clear air before pulling on the fishing line. This flight went without any problems and a considerable length of line was pulled off the reel. Reversing the drone released the line which fell very quickly from the craft with no problems of entanglement. The following pictures show some of the stages of the tests.





As can be seen above the Hi Viz cord shows up well. The fishing line is invisible and impossible to see even in real life. Replacing the fishing line with Hi Viz cord is a great improvement. See below.



What is it like trying to get a line over a tree?

The first attempt to put a line over a selected tree was tried from a rather restricted space of my lawn and with a light breeze blowing diagonally across the flight path with the drone flying into the wind. The major obstacle was a wire trap dipole which needed to be left in

place as it was required for a sked later in the day. Hence care was taken to lift off vertically to about 50ft before moving over the tree into the neighbouring field. The drone was rotated 180 degrees and the line dropped successfully. However, when it was recovered the very light fishing line had been taken by the wind more than 10 metres down wind from the target. It was obvious from this result that fishing line was not suitable as it was affected by such light winds. A line of denser material was needed but how would this effect the drone and would it be capable of lifting sufficient line to achieve a reasonable result?

I had purchased, sometime ago, a 50 metre reel of Hi Viz cord from SOTAbears to be used to make guy ropes to support a 70Mhz beam during contesting. Needless to say there was a considerable amount left on the reel.

Hi Viz Antenna Cord

Manufactured just for SOTAbears, this polyester cord has been designed to have a high visual signature. It's a fluorescent yellow and it's not easily missed. At 2.4mm (0.1 inches) it's thin and light with a breaking strain of 45kg (100 lbs) it's strong enough for most antenna jobs. Hard wearing and lightweight it's just perfect for those occasions when you don't want people to fall over your antenna.

Supplied on a spool in a generous 50m (160ft) length, it's brilliant (literally!). Hi Viz Cord is also available on 200m reels.

To eliminate fraying, we recommend sealing the cut ends of the cord with a flame (lighted match) – careful!

The above information is reproduced with the kind permission of SOTAbears

The cord was attached to the washers in place of the fishing line and another test flight was made. To my surprise the drone pulled the cord off the roll with ease. This was wound on a cardboard tube and a garden cane in the centre used as an axle. The drone was flown away for about 60ft and taken to a height of 50 or so feet. This was managed with the drone under complete control and I was able to maintain a fairly stable hover when required for the purpose of having pictures taken. With everything prepared, I was happy to try and



The above photograph was taken using the camera drone B from an altitude of approximately 350ft.

fly over the tree again using the Hi Viz cord instead of the fishing line. And, of course, I could see where the line was going this time.

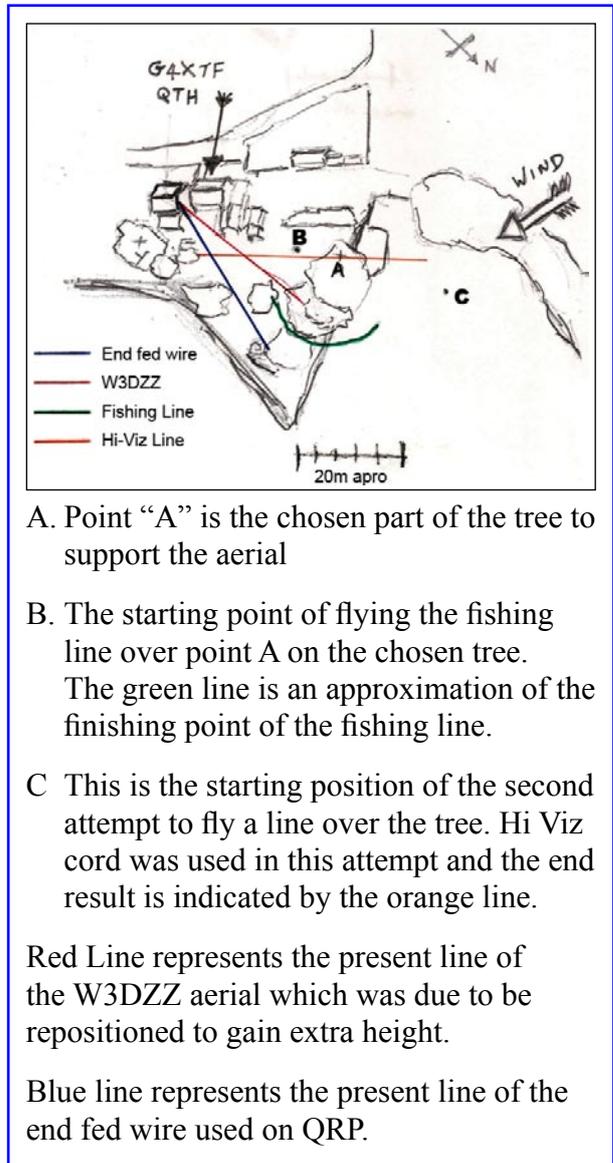
For convenience I reversed the flight path, flying from the neighbouring field towards my garden. The wind conditions were similar except having reversed the direction of flight, it was now a following wind and therefore introduced another variable to the results. However, as explained, using the Hi Viz cord made it much easier to place the cord over the part of the chosen tree.

The drone was flown well into the garden and the cord was released which fell over the end fed wire aerial. The final act of pulling a more substantial supporting rope back was now relatively easy and the W3DZZ was soon hauled aloft.

In conclusion, the Horizon Chroma Blade drone can be used to place a line over a tree with a fair accuracy. The idea of using fine fishing line had its visibility limitations and was discarded. Also, the fishing line was affected too much by even the lightest of breezes making it very difficult to place it in the correct tree, yet alone the best branch. Replacing the fishing line with SOTAbeam's Hi Viz cord made the process much easier in that the cord was very visible and more stable in the wind. Once placed in the tree the Hi Viz cord could be attached directly to the final supporting rope for retrieval.

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Having written this article I have made a few more test flights. It was during one of these flights I came across an interesting phenomenon. I wanted just to use up some of the charge in the battery before putting the



- A. Point "A" is the chosen part of the tree to support the aerial
- B. The starting point of flying the fishing line over point A on the chosen tree. The green line is an approximation of the finishing point of the fishing line.
- C This is the starting position of the second attempt to fly a line over the tree. Hi Viz cord was used in this attempt and the end result is indicated by the orange line.

Red Line represents the present line of the W3DZZ aerial which was due to be repositioned to gain extra height.

Blue line represents the present line of the end fed wire used on QRP.

drone away. Li Po batteries do not like being stored fully charged or with a high charge content so I wanted to do a few high altitude climbs to use up the energy. I rather rushed setting out the line with the washers and left it lying straight out to the rear of the craft so as it lifted up vertically it dragged the washers towards it and set up a pendulum motion. The drone's sensors noticed this motion and tried to counter the force by moving in the opposite direction. This made the swing greater and the response of the drone increased in a positive feedback and so the craft was starting to lose control. To stop it getting out of hand I quickly brought the drone down in order to put the washers on the ground. If a line had been attached this would not have happened as the tension on it would act in a manner to dampen the swing.

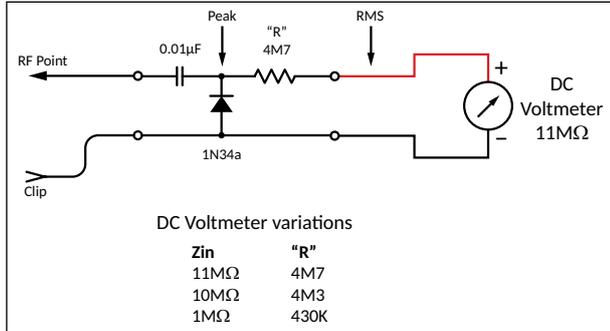
*Very Interesting Nigel
Thanks, Ed*

RF Probe

Measuring RF Voltage (RMS)

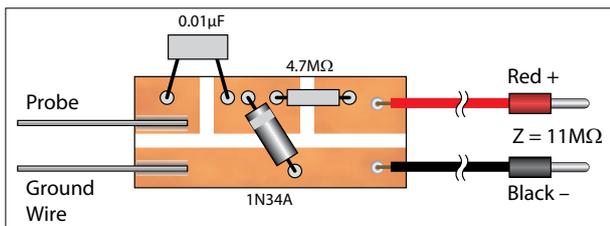
In the last issue of the Journal (May), the Tuna Tin 40m TX circuit was described. When reading the circuit you will be able to see that expected RF voltages are given at different points. This short article describes how a home-brew RF Probe can be constructed which when connected to a multimeter set the measure DC volts, will fairly accurately make the RMS (root-mean-square) measurements needed.

The circuit is shown:



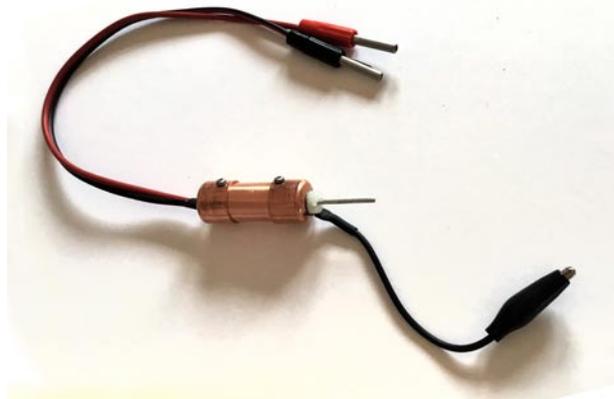
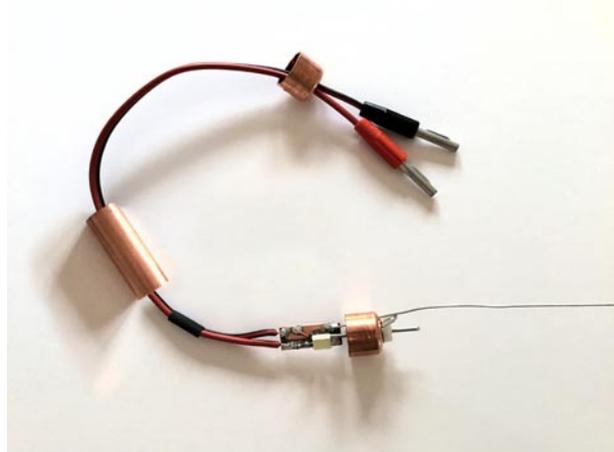
The peak RF voltage is quite accurate provided that the input signal to be measured is reasonably sinusoidal. For RMS readings it is necessary to divide this by 1.414 and this is done by including the 4M7 resistor and using a good voltmeter which has an input impedance of 11M ohms, such as Fluke and look-a-likes. For a smaller meter with an input impedance of 1M ohms only, the 4M7 is replaced by 470K ohms, for the required result.

The pcb layout is shown:



Obviously, as we are measuring RF, hands need to be away from Probe point and ground needs to be connected at all times. The case comprises a piece of plumbers 15mm copper pipe with two copper end-caps (all B&Q) and the PCB is sized to fit. A 5mm hole is drilled into each cap. Cap 1 takes a nylon M5 screw which has a hole drilled through the middle for a stiff probe point. Cap 2 is the cable leads output.

If in doubt ask me! ...Ed



BYLARA

British Young Ladies Amateur Radio Association. BYLARA

This young ladies association is affiliated to the RSGB and has the dedicated callsign M0BYL.

There are nets every Wednesday on 7.175Mhz at 0700-0900; 1100-1300 and 2000-2200 using this callsign. The ladies issue a quarterly newsletter, arrange DXpeditions, and actively generate support for the RNLI; to name a few. The web site is www.bylara.org.uk

Contest Corner

The last couple of months HARS has continued to get some great results in the very popular series of UKAC events. We have had some new members active and getting some good points. Andy G4XRS is now often heard on the bands portable and fixed. Stuart G3WRA and Grant G4ILI are also moving up the band placings.

In 50MHz we have remained in 2nd place consolidating our position.

On 70MHz we have gained 1 place with some good results but may gain another place with the April results when they finally appear.

In 144MHz we have taken 2nd place, a great effort in the most hotly contested band.

We have moved up to 4th on 432MHz and came 2nd in March and April events.

On 1296MHz again we have moved up to 3rd and can expect further improvements with Dave G4ASR's mast head SSPA and Stuart G3WRA adding the band.

On SHF we are running 7th from Dave G4ASR on one band. However, Matt G8XYJ is looking to get on SHF too.

Overall, we are currently 3rd placed local club in the country! And from a rural area too.

HARS is also 21st in the 80m CC series, any help at all would be greatly appreciated, I'm sure many members have access to 80m? There are CW, SSB and data events to enter.

73 Steve G1YBB

Upcoming Contests:		
80m CC CW	25-May-17	1900-2030 (UTC)
80m CC DATA	05-Jun-17	1900-2030 (UTC)
144MHz UKAC	06-Jun-17	1900-2130 (UTC)
50MHz UKAC	08-Jun-17	1900-2130 (UTC)
432MHz UKAC	13-Jun-17	1900-2130 (UTC)
80m CC CW	14-Jun-17	1900-2030 (UTC)
70MHz UKAC	15-Jun-17	1900-2130 (UTC)
1.3GHz UKAC	20-Jun-17	1900-2130 (UTC)
80m CC SSB	22-Jun-17	1900-2030 (UTC)
80m CC CW	03-Jul-17	1900-2030 (UTC)

RSGB UKAC Overall Local Club Standings 2017								
	Club (33 clubs total)	50MHz	70MHz	144MHz	432MHz	1.3GHz	SHF	Total
1	Sheffield & DWS	1000	1000	1000	1000	1000	358	5358
2	Bolton Wireless Club	485	473	756	797	507	1000	4018
3	Hereford ARS	854	422	827	674	332	116	3225
4	Workshop ARS	497	631	785	799	308		3020
5	Trowbridge & DARC	222	265	574	356	196	784	2397
6	RAF Waddington ARC	523	409	417	486	307	23	2165
7	Coulsdon ATS	272	250	170	242	150		1084
8	Parallel Lines CG	172	229	115	177	170	211	1074
9	Cheltenham ARA	107		67	81	136	547	938
10	West Kent ARS	226	173	294	109	91		893

Club Band Standings (top 10 shown)										
	50MHz (27 clubs)	Total	70MHz (23 clubs)	Total	144MHz (29 clubs)	Total	432MHz (29 clubs)	Total	1.3GHz (21 clubs)	Total
1	Sheffield & DWS	23217	Sheffield & DWS	13079	Sheffield & DWS	26195	Sheffield & DWS	22558	Sheffield & DWS	17645
2	Hereford ARS	19828	Workshop ARS	8248	Hereford ARS	21673	Workshop ARS	18017	Bolton Wireless Club	8951
3	RAF Waddington ARC	12137	Bolton Wireless Club	6190	Workshop ARS	20575	Bolton Wireless Club	17977	Hereford ARS	5852
4	Workshop ARS	11528	Hereford ARS	5522	Bolton Wireless Club	19796	Hereford ARS	15200	Workshop ARS	5440
5	Bolton Wireless Club	11249	RAF Waddington ARC	5349	Trowbridge & DARC	15038	RAF Waddington ARC	10962	RAF Waddington ARC	5411
6	Coulsdon ATS	6314	Trowbridge & DARC	3469	Triple B ARCG	11396	Trowbridge & DARC	8029	Martlesham RS	4000
7	West Kent ARS	5244	Coulsdon ATS	3269	RAF Waddington ARC	10934	Vecta CG	6541	Trowbridge & DARC	3467
8	Trowbridge & DARC	5160	Parallel Lines CG	3000	West Kent ARS	7704	Coulsdon ATS	5458	Parallel Lines CG	3000
9	Guildford & DRS	4018	West Kent ARS	2258	Vecta CG	7667	Parallel Lines CG	4000	Northampton RC	2933
10	Parallel Lines CG	3990	Telford & DARS	2199	Southport & DARC	6084	Martlesham RS	3798	Isle of Man ARS	2696

HARS radio equipment available for loan to Club members

The following list of equipment is available for loan to Club members. The loan period is 3 months and members wishing to use the equipment will have to sign a simple agreement which covers the loan terms. If you wish to borrow then please contact Duncan (Hon Sec) M00TG.

Grid Dip Meter MFJ-201

Pixie 7MHz QRP kit. Needs assembling.

Buddipole 10-40M portable antenna with tripod and carrying case.

Baofeng UV-5R 70cms/144MHz hand-held complete with accessories.

Yaesu FT450 All bands to 50MHz. Needs a 12V PSU

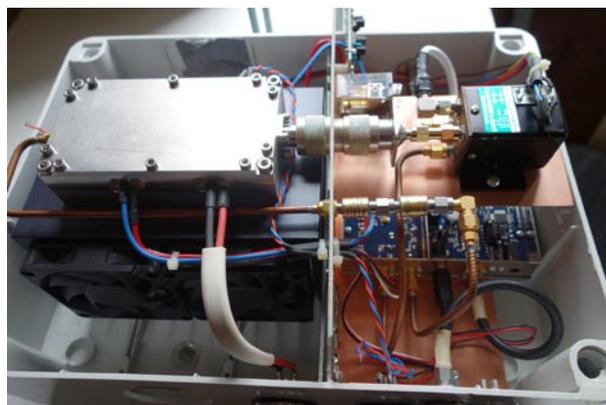
Go portable with the Buddipole! Ed.

Club Night 5th May

The meeting was all about the club members and their home-built projects. This kind of evening procedure happens every once in a while and is a wonderful opportunity for members to see what gems of radio equipment each has produced. Two very notable projects are highlighted. First, we were all treated to a talk by Dave G4OYX on his AM 70W transmitter which was xtal-controlled on given bands. Of particular interest was the use of two robust Russian GU50 PA valves.



The second most notable exhibit was the 23cms SSPA (solid state power amplifier)/transverter, produced by Dave G4ASR. Although not 100% finished, it had all of the



hallmarks of a super project. The RF available output was 250W and consumes 15A at 30V DC. The RX part of the transverter has a 0.9dB noise factor so an LNA is not required.

Built to a very high standard, the unit is waterproof and intended to be mast-head mounted for direct loss-free connection to the antenna.

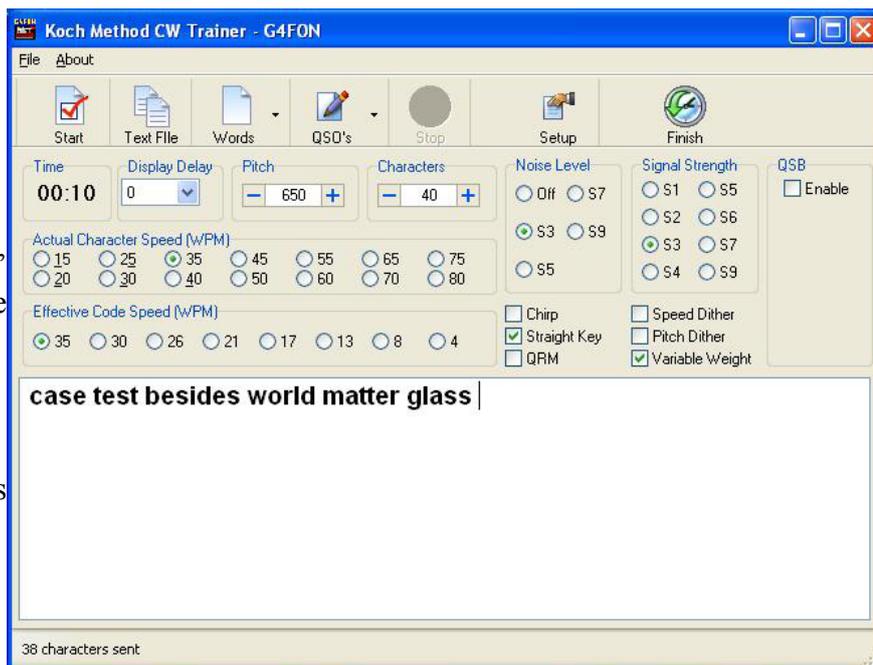
The PA is cooled by two fans where No2 fan comes on in “transmit” mode. The TX/RX switching function is made by a magnet-assisted transfer relay whose position is selected by simple 100mS 24V drive pulses. This relay is “set” before RF power is turned on and “un-set” after the RF power is turned on. This is known as “dry switching”. This relay does not consume any DC power, it is simply triggered by the mini pulses applied.

A wonderful evening ...Ed

Morse Trainer

Ray, G4FON, has given his permission for the Journal to publish notes about his Morse training software.

The often used “Farnsworth” method, where characters are learned with wide spacing which is reduced as progress is made, is replaced by the Koch method. With the Koch method, two characters at a time are learned at the desired speed and another character introduced when the operator becomes 90% proficient.



The training software is available by going to www.G4FON.net Ray says that although the software is a bit old now, it is nevertheless entirely fit for purpose and it runs with Windows 10.

VSWR Meter

By Dave Porter

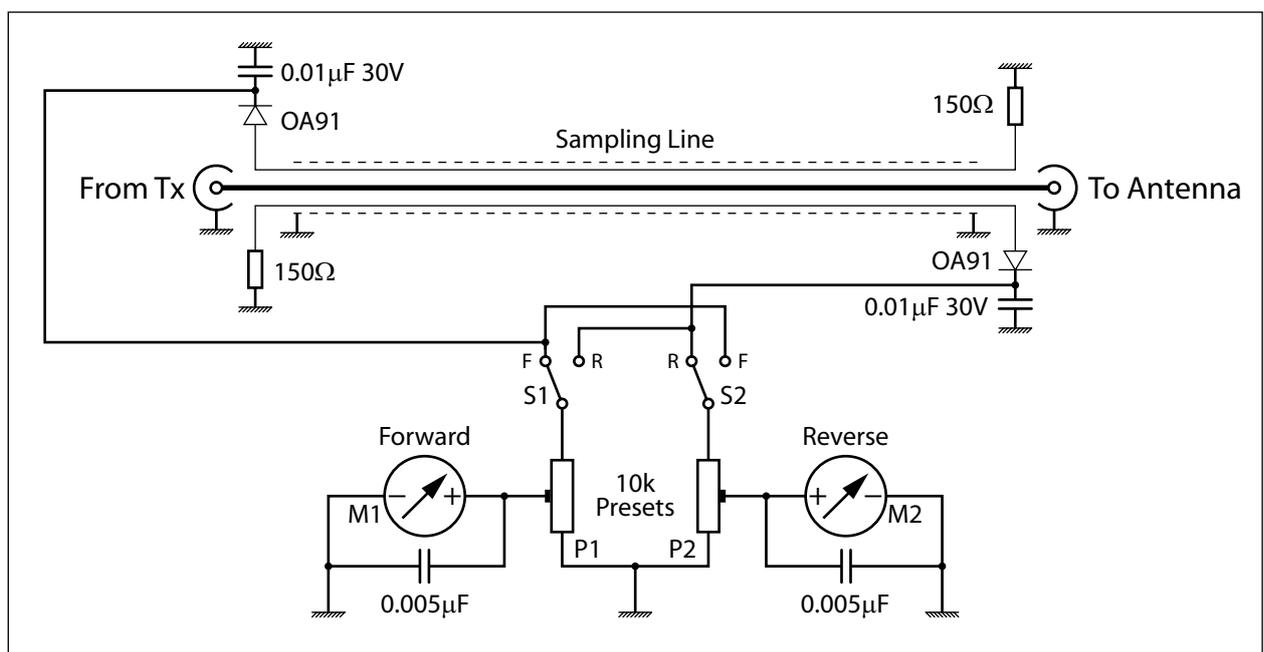
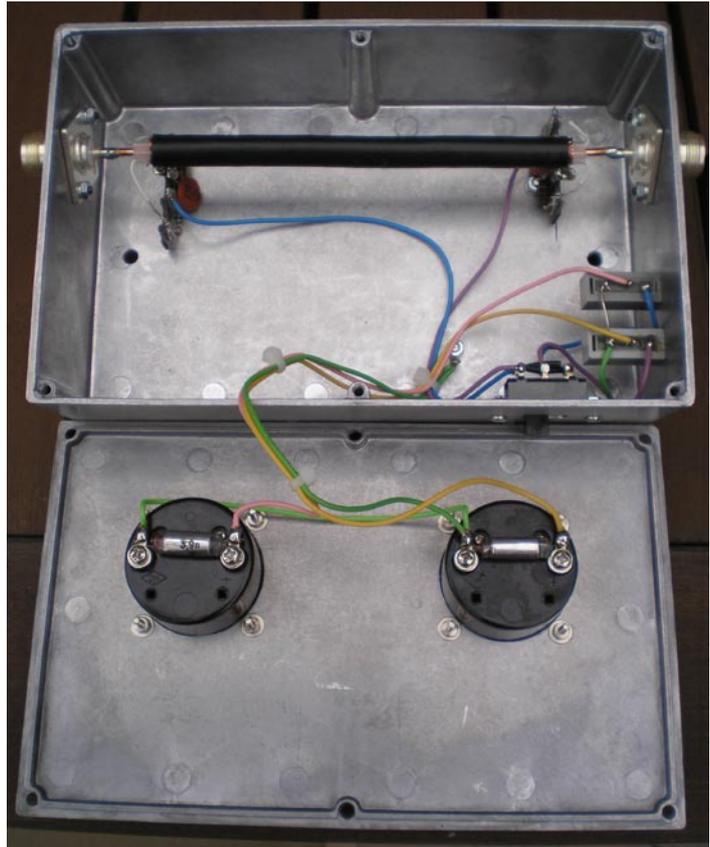
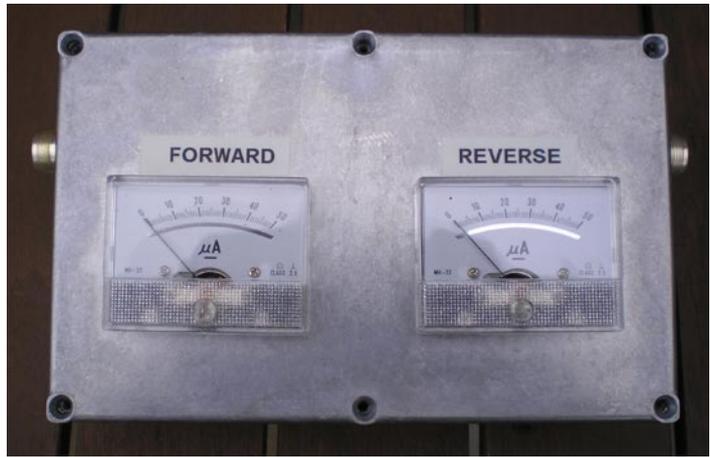
This design has three options. 40M – 10M; 80M – 10M; 160M – 10M. The secret is the WESTFLEX 103 coaxial cable in use. Because of the coax “fluted” internal insulator, it is possible to thread a pair of small wires known as “sampling lines” side-by-side (but not in contact) with the coaxial inner.

For 40-10M operation the length of coax is 6”, for 80-10M, 9” and for 160-10M 12”.

For greatest sensitivity 50uA meters are employed but for high power (HF 200W, VHF 150W) 1mA meters are recommended.

P1 and P2 are preset potentiometers. To calibrate, with the switch S1 in the FORWARD position, meter M1 reads TX output and P1 is adjusted for FSD on known CW output from the TX. Meter M2 therefore reads the reflected power (VSWR). Now switch to REVERSE and adjust P2 to show the TX CW power output again.

Useful tool David...Ed



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