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GB7NS: 439.1625(DMR)
GB3HO: 430.8875/88.5 (438.4875)(FM)
GB3HY: 430.900/88.5 (438.500)(FM)
Local DX Cluster GB7DXS : Telnet
81.149.0.149 Port 7300

Club newsletter

May 2021

Editor: Richard, G3ZIY

Club Covid-19 lockdown "keeping in touch"
Sunday mornings from 1030 local on 28.430±kHz USB
Wednesday evenings from 2000 a Zoom presentation/chat evening

I hope you are all well and that the latest lock-down hasn't been too taxing. The good news is that the relaxation of the rules which came into force this week now allows up to 30 people to meet outdoors though indoor gatherings remain limited to 6 people for the present. Given this, the committee has agreed that we should hold a regular OUTDOOR meeting at the club hut every Sunday morning (weather permitting). We plan to have tea and coffee available outside with seats to make ourselves comfortable.

To keep things as safe as possible we maintain social distancing and ask you respect this during the meetings. The toilet will be available for use throughout. With a following wind we hope to resume normal meetings later in June.

In other news, the CARC contest team are preparing to take part in VHF NFD over the weekend of 3/4 July from our regular site near Dover and any members who would like to come along are more than welcome, please get in touch with me for further details.

Also the very popular WHATSAPP group is migrating to SIGNAL. This is as a result of the change in privacy policy which Whatsapp/Facebook are imposing. Migration details are available in the current Whatsapp group or if any new members would like to join the signal group, do get in touch for details.

Mike, Chair, CARC

I know that Jack (G4TVC) hasn't attended CARC for some time, but I'm sure that some of the Members will be sorry to hear that Jack passed away on Thursday 29th April. His children were with him when his life support was switched off. He leaves two daughters, Jacqueline, Julie and one son Robert. There are several grandchildren and great grandchildren.
Regards from Mick, G4EFO son in law.

How high is your aerial?

Well, it depends. Firstly there is it's physical height above ground, which is easy enough to measure, but there is also it's effective height above the reflecting layer underground.

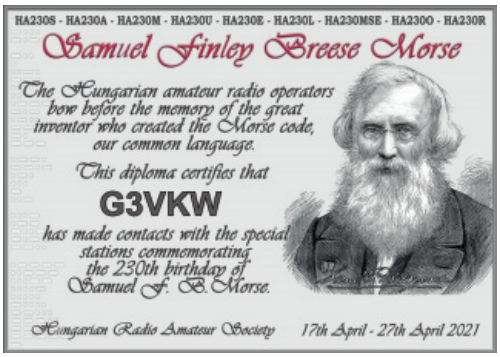
I've used the term reflecting, but the process is more of a refracting effect, much like the view if a pencil in a cup of water appearing to be bent. This effect is due to the abrupt change in dielectric constant between air and water. In a vacuum, the dielectric constant is 1.0000, because there is no matter to slow down the speed of propagation of electromagnetic waves. Every other material does have a dielectric constant value. Air is 1.00058986 at sea level (slightly variable with atmospheric conditions), and fresh water is about 80 at 20°C and it is almost the same for sea water. Soil however, is very variable, and changes when wet, so the effect is difficult to predict with any accuracy.

Over land therefore the effective height of an aerial is greater than it's physical height. This is (in the case of horizontal aerials) generally of benefit for long distance performance, as the elevated height will reduce the angle of elevation of the main lobe. The reflected wave is slowed during it's passge through the soil and when it comes back up to the surface it speeds up and either constructively or destructively adds to the rays from the aerial which have only propagated through air. Generally with the height amateur aerials are above ground, the phase change between these two sets of rays is not excessive on the HF bands, as the wavelengths are relative long compared to the distance travelled through the soil. The effect is to depress the elevatation angle of the main lobe.

The other electrical effect on materials is their conductivity - how well they conduct electricity. Sea water is very conductive, pure water is a great insulator, and soil is somewhere in between. Conductivity and the dielectric constant for any particular material is denoted by Seimens per metre (S/m) and kappa (κ) respectively. Dielectric constant is the ratio of a capacitor with a dielectric material between the plates to the same capacitor with a vacuum between the plates, and is a unitless value. (It can range between 1-18000 approximately.)

As the RF sinewave travels over the earth's surface, the upper part of the wave is travelling in air, and some of the lower part is in soil, where it travels more slowly (due to the higher dielectric constant) and thus it's (soil) wavelength shortens. As the overall sinewave has to be continuous (it cannot break apart at the air/soil boundary), the net effect is that the sinewave has to curve towards the slower medium - the soil in this case - and it thus tends to follow the curvature of the earth, although as if the earth were 4/3 the radius that it actually is. This why the groundwave goes further than the optical horizon.

Richard, G3ZIY



Well done Keith!

Restoring a battery pack

Messing about with LiPo or Li-ion batteries is extremely hazardous. Puncturing, denting, overcharging or short circuiting could result in severe fire or explosion probably causing severe injury or death.

Do NOT dismantle indoors. Do NOT handle without suitable Personal Protective Equipment (PPE). Do NOT use metal tools when dismantling. Have a fire extinguisher suitable for chemical fires available – it will not put out the battery fire but could stop it spreading.

I have an Anytone 878 2/70 Analog/DMR handie that came with two battery packs – 2100mAh and 3100mAh. For just about all of the 2 years or so I have had the radio I have used the large battery – it lasts around 2 weeks of daily use before the battery indicator drops to mid way and then it gets recharged.

A few weeks ago I decided to give the smaller battery some exercise, charged it up and went for my usual walk. I was surprised and disappointed to find that the radio died after only about 20 minutes of monitoring MH and two call outs.

On returning home the battery was recharged, however full charge indication was reached very quickly, and on test became flat again very quickly.

These nominal 7.4V battery packs comprise two 3.7V cells in series, and each cell has its own protection circuit.

The protection circuit cuts off charging if the cell voltage goes above a limit (circa 4.2v depending on the chemistry). The circuit will also cut off discharge if the cell voltage drops below the minimum safe limit (circa 3v/cell again depending on the chemistry).

Measuring the voltages when the battery was flat, and again when full indicated that it was very likely the battery cells had become unbalanced during the months without use. My guess was that when charging one cell was just about fully charged and its internal protection circuit stopped the charge even though the other cell was almost empty. When discharging the empty cell protection circuit cut off the power to the radio though the other cell was almost fully charged.

The Anytone charger is not a balanced charger. A balanced charger measures the voltage and current to each cell in the battery and is able to adjust the charging so that each cell ends up with an even charge. This requires connections to be available on the battery to enable each cell to be monitored. The Anytone battery has three terminals, however the middle one is a temperature cut out and is no use for balancing.

As the battery was essentially useless and I had nothing much to lose other than hands, sight etc. the decision was made to try and open it up, test the hypothesis that the cells were unbalanced and if so use a proper charger to charge each cell individually. At this stage there is no way of knowing if the cells would hold a good charge.

The Anytone battery case is made of two parts, only sparingly glued together and it proved easy to prise open the case using some plastic prise tools intended for mobile phone repair. Great care was taken not to damage the cells inside. If whoever it was in

China who assembled the battery had applied a bit more glue it might not have been so simple – your mileage may vary as they say.

Once open you can see the two cells and a small PCB connecting the cells in series, to the charger contacts and to the radio contacts. The board may possibly contain the protection circuits for each cell. The cells are attached to each other and to the outer case part with double sided tape – there was no need to risk separating them.

Li-Ion or LiPo batteries can swell up if they are mistreated. If they are swollen do NOT attempt to charge - dispose of them safely. The cells in my Anytone battery were fine.

After some careful prodding with the multimeter to identify what was connected where the voltages of each cell could be measured, and sure enough one was full at around 4.2V, the other just about empty at 3.2V. The battery nominal voltage is 7.4V, which is when both cells are roughly at mid charge, explaining why the radio battery indicator showed full.

If the voltage of a cell has dropped significantly below its safe voltage then recharging should NOT be attempted – dispose of it safely and buy another.

I have a battery charger designed for charging Model Remote Control batteries. This charger enables the cell chemistry and charging current to be selected, and has the necessary monitoring to prevent overcharging and stop when the cell is full. If the battery pack has the necessary connections the charger is also capable of balancing the charge in the individual cells. Remote Control Model batteries usually do not have protection circuits in them – it is not desirable for a model plane or helicopter motor to just cut out and stop when in mid flight. The charger monitors the voltages, adjusts the current during the charge and stops when the cell is at the maximum voltage. Low cost chargers might rely on the battery protection circuit to stop the charge – do not use such a charger for the following procedure as you may be bypassing this protection system.

Croc clips were used to connect just the empty cell in the battery pack to the RC charger, taking care to make sure that there was no possibility of the clips slipping and short circuiting the cell. Starting at 100mA charge current the battery was monitored to make sure it did not get warm, then the charge current was increased to 300mA. Reassuringly the cell took many hours to reach full charge indicating it was likely to be still healthy. The charger provides an indication of cell voltage and mAh put into the cell. The same was repeated with just the almost full cell to get both cells to the same state.

The battery parts clip together quite nicely without needing glue, and when placed in the radio the battery retaining clip holds everything together as well.

This smaller capacity battery now lasts well over a week of daily use before the battery indicator drops a notch – success!

NOTE:

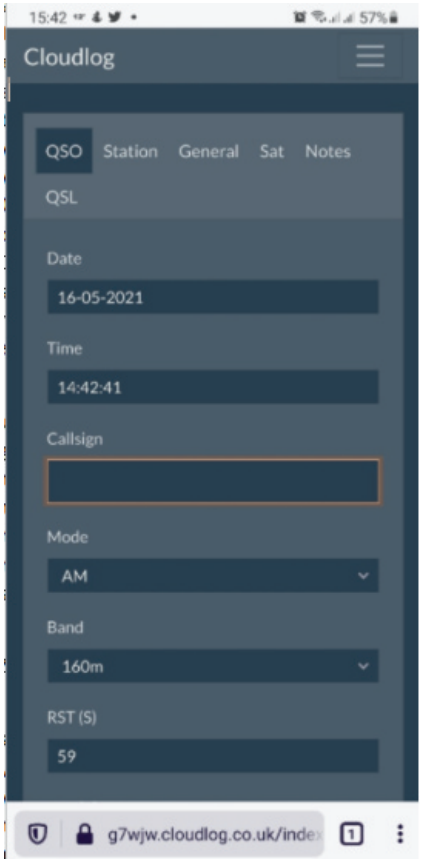
This is a description of what I did – not a recommendation. The recommendation is not to open up any Li-Ion or LiPo battery. I happened to have PPE available along with a healthy fear and awareness of the dangers and a Northern attitude to spending money. A proper charger with end of charge monitoring adapted to the battery chemistry is essential. **Whatever you do is at your own risk.**

David, M0WID

Cloudlog: the cloud-based logging software

A few months ago, I was introduced to an open-source piece of software called Cloudlog which you could either host on your own website or use their hosted service if you don't want the bother of setting it up yourself and also, it's a great way of supporting the developer. I plumped for the easy route as I wasn't ready to load it on my website unless I'd first tried it for a while. The software is based on PHP and MySQL so would work with all web servers.

Having used the obligatory Ham Radio Deluxe and NM1MM loggers, which are both good and have their different pros and cons. To me I was looking for a logger which was both in my pocket and on any of my PC's and my Raspberry Pi400 which is linked to my FT991 or my IC 7300 which is connected to an old PC in the shack.

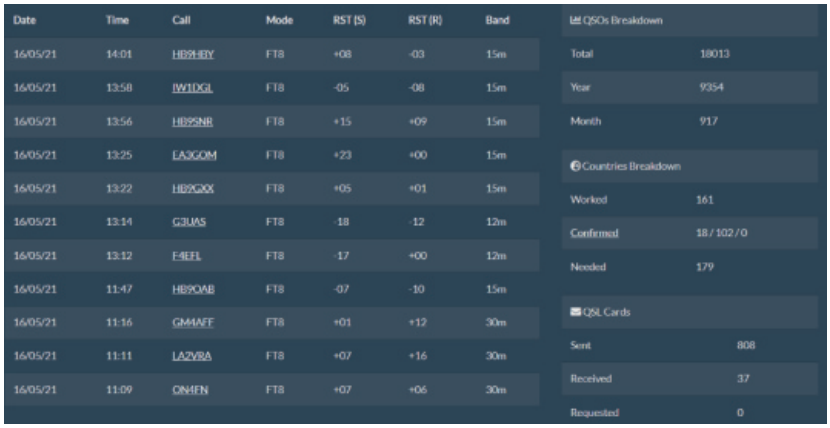


Not only can you replace the logging software on your computer with this but you can take it portable without lugging a computer with you, logging QSO's conveniently straight on your smartphone instead. No more scraps of paper or notes on your phone, you just log your QSOs straight into Cloudlog and you're done.

It integrates with LOTW, eQSL, Clublog, and QRZ too, automating the process to make it seamless.

One of the real benefits to a cloud-based logger is that there's very little processor overhead needed, meaning that you can use an older PC without any issues and it also makes it compatible with Windows, Linux or Mac as well as any phone with a web browser (or even a smart TV!).

You get a nice QSO breakdown next to your list of QSO's that lets you see at a glance how many countries you've worked and how many contacts you've made.



Date	Time	Call	Mode	RST (S)	RST (R)	Band
16/05/21	14:01	HB9HBY	FT8	+08	-03	15m
16/05/21	13:58	IW1DGL	FT8	-05	-08	15m
16/05/21	13:56	HB9SNR	FT8	+15	+09	15m
16/05/21	13:25	EA3GOM	FT8	+23	+00	15m
16/05/21	13:22	HB9CQX	FT8	+05	+01	15m
16/05/21	13:14	G3UAS	FT8	-18	-12	12m
16/05/21	13:12	F4EFL	FT8	-17	+00	12m
16/05/21	11:47	HB9QAB	FT8	-07	-10	15m
16/05/21	11:16	GM4AFF	FT8	+01	+12	30m
16/05/21	11:11	LA2VBA	FT8	+07	+16	30m
16/05/21	11:09	ON4EN	FT8	+07	+06	30m

And it has built in support for awards' tracking for many different awards like DXCC, SOTA, IOTA, CQ and you can run analytics on your logs such as the distances worked and who your furthest worked contact was etc.

To connect it to WSJT-X I used another program called Grid tracker

Awards - DXCC

Deleted DXCC: ☐ Include deleted

Worked / Confirmed: ☑ Show worked ☑ Show confirmed ☐ Show not worked

QSL / LoTW: ☑ QSL ☑ LoTW

Continents: ☑ Antarctica ☑ Africa ☑ Asia ☑ Europe ☑ North America ☑ South America ☑ Oceania

Band: Every band

Mode: All

Reset Show

CSV

Search:

#	DXCC Name	Prefix	160m	80m	60m	40m	30m	20m	17m	15m	12m	10m	6m	2m	70cm
1	MONACO	3A	-	-	-	-	W	-	-	-	-	-	-	-	-
2	AZERBAIJAN	4J	-	W	-	W	W	W	W	-	-	-	-	-	-
3	GEORGIA	4L	-	-	-	-	W	W	-	-	-	-	-	-	-
4	MONTENEGRO	4O	-	-	W	W	W	W	W	W	-	-	W	-	-
5	SRI LANKA	4S	-	-	-	-	W	W	-	-	-	-	-	-	-
6	ISRAEL	4X	-	W	W	W	W	C	W	W	W	-	-	-	-
7	LIBYA	5A	-	-	W	-	-	-	-	-	-	-	-	-	-
8	CYPRUS	5B	W	W	W	W	W	W	W	W	W	-	-	-	-
9	TANZANIA	5H	-	-	-	-	-	-	-	W	-	-	-	-	-
10	MAURITANIA	5T	-	-	W	W	W	-	W	W	W	W	-	-	-
11	KENYA	5Z	-	-	-	W	-	W	W	W	W	-	-	-	-
12	JAMAICA	6Y	-	-	W	W	-	-	-	-	-	-	-	-	-
13	ALGERIA	7X	-	-	-	W	-	W	-	W	W	W	-	-	-

Showing 1 to 143 of 143 entries

Summary

CSV

	160m	80m	60m	40m	30m	20m	17m	15m	12m	10m	6m	2m	70cm	Total
Total worked	45	82	87	105	111	96	85	83	61	54	27	8	1	144

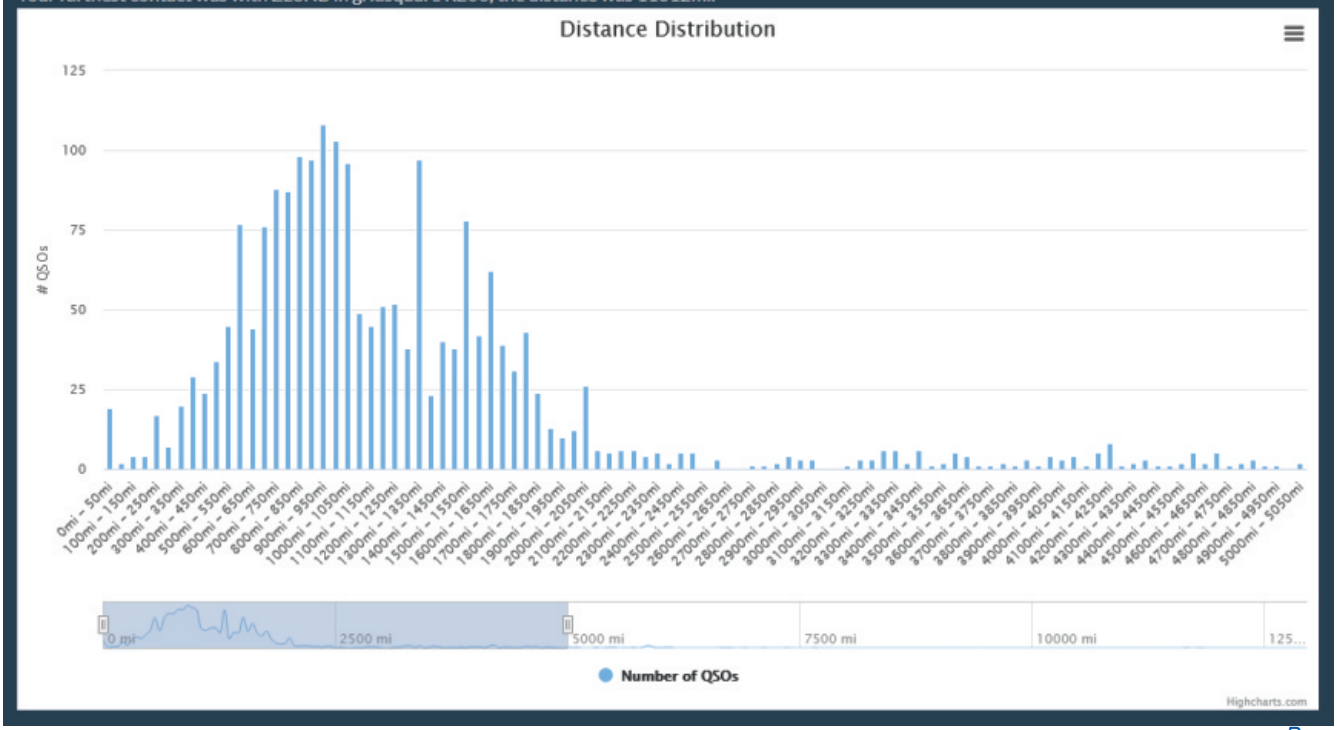
Cloudlog Logbook QSO Notes Analytics Awards Admin Search Callsign Search G7WJW

Distances Worked

Band Selection 20m All Plot

2098 contacts were plotted.

Your furthest contact was with ZL3NB in gridsquare RE66; the distance was 11812mi.



which is setup to take a broadcast from WSJT-X and then relay it into Cloudlog. There are other options but this was the easiest to set up for me.

You're welcome to look at my public logbook which you don't have to log in to see, this just shows all of the entries g7wjw.cloudlog.co.uk

Cloudlog is available from cloudlog.co.uk and gridtracker is available from gridtracker.org

Stay safe and 73s

Gareth G7WJW

Free and open source remote operation of many Icom radios with wfview

Here's the link to a Youtube video describing this software, which I think will be of interest to all you many Icom radio owners in the club. https://youtu.be/BZxW9AESIBk

Richard, G3ZIY

VHF NFD photo of Jim Brennan (SK) who climbed up the tower to adjust the antenna long before the days of risk assessment or health and safety. (Photo courtesy G3VJM)

Here is a very old photo of hams from both RATS and CARC, probably 1970 or so. See who can name the most.
Derek Thoms G3NKS is on the left and John Graham G2TR is second from the right. Any ideas on the others?
Adrian, G3VJM.

Adverts

These components from a silent key are looking for a good home. If you would like any of them please contact M0XIO at Glenn@lonefox.co.uk

A donation to your favourite charity is requested.

I have an **IC-PCR1000 communications receiver** for computer, with aerial, mains power and instruction booklet for sale. If you are interested I can send photos if you supply an email address, we are open to sensible offers. kilnantogue@yahoo.com

Tesla referral code. If any of you are thinking of buying a new Tesla car, please consider using my referral code https://ts.la/richard59094 which will get you and me both a free 1000 miles worth of supercharger electricity.

Richard, G3ZIY.

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This may be one way to get the Church authorities to approve an application to install a repeater!

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