Llais Y Ddraig
The Dragon's Voice

Cylchlythyr Clwb Radio Amatur Y Ddraig
Newsletter of the Dragon Amateur Radio Club

Hydref/October 2015. Rhif/No. 108

Rhaglen Clwb / Club Programme

October
5th Show and Tell.
19th Marconi - His Life & Achievements.
(A talk by Dave Roberts GW8NZN).

November
2nd Junk Sale.
16th Annual General Meeting.
(Your chance to exercise your democratic rights).

December
7th The Future of DARC.
(A chance to air your views on the club's activities in 2016)
21st Christmas Social.
(At the Four Crosses Inn in Menai Bridge)

January 2016
4th The M0NKR Transceiver Kit.
(A talk by Danny GW7BZR)
18th Quiz
(There may even be a prize!)

DARC AGM 2015

The Dragon Amateur Radio Club, Annual General Meeting will take place on Monday 16th November 2015 at 8pm. This is YOUR opportunity to vote on who, or how YOUR club is run, so please show your support and attend.

If you have any item's you wish to include on the Agenda, then please let the club secretary Stewart GW0ETF known by close of play on Monday 2nd November.

Stewart can be contacted via mobile on 07833620733 or email: gw0etf@btinternet.com

In this Issue....

From the Editor...

Well October is with us once again and as winter draws near let us hope that the conditions on HF improve after the awful 'Summer Doldrums' we have experienced this year. During autumn, it is a time to undertake maintenance of your antenna systems before the colder weather arrives, or if you do not have an antenna up at your QTH, now is the time to ask your friends at the club to help you remedy the situation. I must admit I am one of those member's of DARC who needs to get an antenna up at his home QTH so that I can hopefully enjoy some radio time from the warmth of my shack without freezing whilst out playing kite portable!

I am happy to report that attendances at recent DARC club nights have increased after a low turnout at a number of meetings throughout the summer months. It really is good for our speakers to have the opportunity to talk to a larger audience and I believe makes for a more enjoyable evening for everyone. Remember this is YOUR club and it should reflect your interests in the hobby. With this in mind, on the 7th December the club meeting is titled 'The Future of DARC', this is your chance to come along and discuss what you want from the club. I hope that as many of you as possible will attend and offer your thoughts about the club and it's future direction.

I look forward to seeing you there. '73

Simon. 2W0CHV

Membership Subscription

A Message from John Brimecombe GW3GUX

Club subscription's are due from the end of September and once again will remain at £10.00. As I can not often get to club these days, there are two ways in which you can pay.
Simon 2W0CHV (the door man) will be collecting subs before each club night in October and the first meeting in November, or you can post them to me John Brimecombe, Llwyn Onn, Glanrafon, Llangoed, LL58 8PH. Cheques should be made out to Dragon ARC.

Please remember that you must be a paid up member to vote or indeed take a place on the committee at the AGM on the 16th November. So please pay up, as your club needs you!

GW4TTA from Penmon Lighthouse

On the 15th and 16th August 2015, members of DARC took their annual trip to the Coastguard Station overlooking Penmon Lighthouse in order to take part in the International Lighthouse & Lightship Weekend. With a simple wire antenna and 100watts from the club transceiver, members enjoyed dozens of leisurely QSO's with amateurs and other lighthouse special event stations around the UK and Europe, in spite of the rather indifferent propagation. Even the weather Gods were on our side as the sun shone and the views were simply breathtaking!

The Shack

View from The Shack

Bryn MW6DZO busy controlling the pileup!

Memories of Australian Television

Les MW0SEC

My first job in Brisbane around 1972 was to work at Channel 9 (QTQ9). It is alleged that Brisbane is the second largest city in the world. This may be true as regards the 'city' boundary, but the urban centre is not very large, whilst the limits include forestry plantations, large farms, wilderness and mountains. It is on one of these mountains, Mt. Coot-tha, that all of the television transmitters are situated. These included at the time, Ch.9, Ch.7, Ch.10 and the ABC (Australian version of the BBC).

With the exception of the ABC, the station's transmitters and studios were co-located, which had the obvious advantage of not requiring secure links, but also had the disadvantage of a very high field from the transmitter. This made it possible to measure volts of video signal across pieces of rack or other metalwork and thus required close attention to earthing and screening of sensitive circuits.

QTQ9 had all the usual equipment one might expect – Various technical areas and stores, carpenter's shop and vehicle pool. There were two main studios of which 'A' was the smaller, being used for news and talk shows. Studio 'B' was a full sized affair suitable for staging anything up to a large musical, with audience seating and band facilities thrown in.
There was also a room dedicated to the (then) huge and complicated quadruplex video tape machines and telecine.

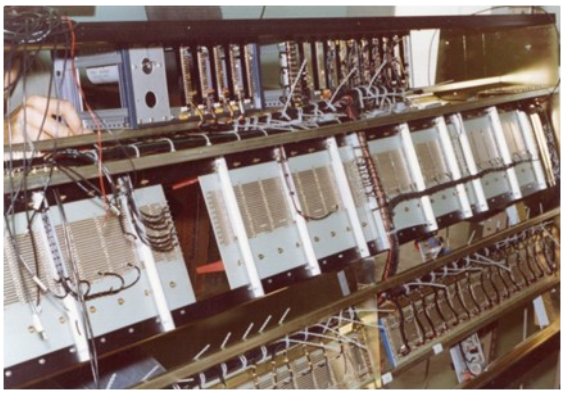
I recall noting on my first visit, some of the installation team working in the corridor to precisely match various lengths of coaxial cable. Whilst in amateur radio the velocity factor of coax is not of great interest unless you are making a matching stub or filter, with video, where sync pulses are on a separate feed, a timing error of a few microseconds can lead to picture displacement.
My arrival at the station coincided with interesting times. Initially they had been transmitting in monochrome using rather dated RCA orthicon cameras, but during my time the very latest in colour equipment was being swung in including Grass Valley group gear and Phillips cameras. The latter were most impressive, since all the video and control signals were transmitted along one thin dual-coax cable, making the huge anaconda connections to the RCA cameras look rather old fashioned.

Whilst the job was quite interesting, maintenance of equipment can become a bit boring and after around a year I joined up with a chap who had just started a business supplying and manufacturing broadcast audio equipment. This doubled the permanent staff! This company was to become very successful and I ended up designing custom audio equipment for all of the television stations and most of the radio stations in the Queensland area. I can also claim to have designed the very first audio mixing desk for the Sydney Opera House – via Amalgamated Wireless (Australasia).

Memories of Australian Television ctd:

The very first mixer we sold, was for Ch.7 – a small outside broadcast unit. On its first use in service, I was watching the event at home when the sound died. I mentioned to my wife that I hoped it was not the mixer! A phone call the next day indicated that they were very happy with the mixer – it was the microwave link which had packed up!

I test out the Ch.7 OB mixer.

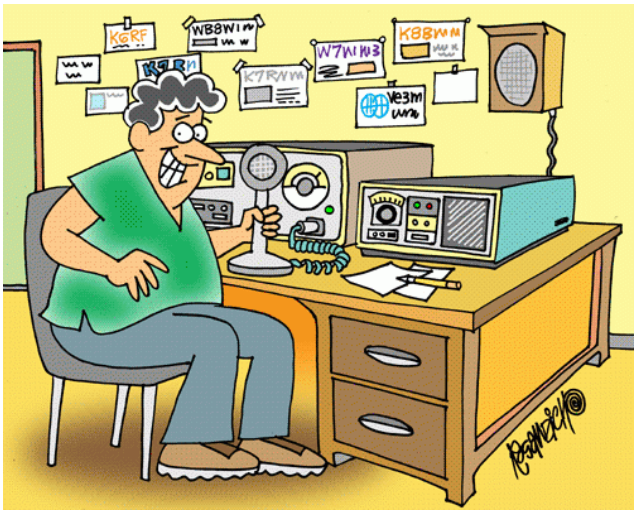


Underneath a rather larger mixer.

One final thing at Channel 9 I will always recall with amusement, is the time that a couple of us had decided to tidy up the rat's nest which was one of the equipment racks. My colleague was intrigued by a screened audio lead which had been taped up and left. He undid the tape intending to trace its origin. He was rather taken aback to receive a healthy belt! Some twerp had used audio cable at some distant time to connect a mains supply. We never did find the other end and as time was running out, taped it back up with a big label stating: "WARNING +50dBm at 50 c/s!"

Les.

In the Shack...



I thought that it would interesting for the newsletter to contain a series of articles looking into the shack's of various members. Tell us what do you have in your shack, your latest piece of equipment or half built project.

Whether you have a whole room to yourself, a shed, or simply a shelf in the dining room, tell us all about your little corner of Amateur Radio Heaven

Any willing mugs, erm I mean volunteers, please let the editor know and between us we can prepare something for the January Issue.

Flex 6300 versus Elecraft K3...

Some thoughts on SDR

Stewart GW0ETF

I've had my Elecraft K3 since 2008 and have ensured it's always been up to date with both software and hardware. Earlier this year I bought one of the latest Flex SDR 6000 series radios which now uses Direct Digital Sampling techniques and have had fun comparing the performance and functionality of both.

If you refer to Rob Sherwood's definitive tables of transceiver performance (http://www.sherweng.com/table.html) you'll see the Flex 6700 and K3 in 1st and 2nd spot. I have the cheaper Flex 6300 which lacks the front end bandpass filters but otherwise is a similar architecture. Performance is very similar, as far as I can judge, between both radios. The Flex receiver is exceptionally clean with no detectable birdies (no analogue mixers) and the Panadapter is superior to the NaP3 panadapter which I use from the IF of the K3. The Direct Sampling in the Flex doesn't involve quadrature down conversion either so there are no 'image' problems which *can* afflict the K3's NaP3 display. The filtering in the Flex is truly 'brick wall' and is really impressive. My K3 has the 2 independent receivers which is invaluable if you make a habit of so called Single Operator 2 Vfo contesting (SO2V). This means CQing or 'running' on one frequency while tuning around on the 2nd vfo looking for other running stations to call – each receiver will be separated in your headphones to avoid total confusion! The Flex has the equivalent of only one hardware receiver which samples and digitizes the whole of the HF spectrum up to 54MHz and can then visually display any part of this spectrum in a panadapter up to 7MHz wide; a software 'slice' receiver with its own selectable bandwidth, mode, AGC setting etc then selects which narrow bit of this 7MHz you will actually listen to and transmit on. The Slice Receiver is what you manipulate when tuning signals and the Flex 6300 allows you to have 2 open at once. So as far as the user is concerned this appears just like having 2 receivers available like in the K3, it's just that the hardware behind all this is totally different. Incidentally the Flex software actually allows you to have 2 independent panadapters with their slice receivers open at the same time; so for example you could be operating SO2V in a contest while having the second panadapter watching for openings on 6m.

The major difference I've found between the K3 and Flex concerns the user interface. The Flex interface is pure software on a computer screen called SmartSDR (SSDR) which is still in development on account of the new architecture of the 6000 series. This is superb when using the Flex for rag-chewing or DXing. For SO2V contesting though you need fast reactions to, for example, knock the 2nd receiver off or at least reduce its audio if someone else answers your CQ on your run frequency, or to choose to either tune the 2nd receiver or the RIT of the main vfo. I find this much easier and more intuitive with the knobs on the K3. I can find them without looking and the effects are immediate unlike some of the mouse clicks or push button presses in SSDR, and it's surprising how the slightest delay puts you off your stride in the heat of a busy contest. For the moment then the K3 is still the rig of choice for me but it's likely the Flex will stay and will get more use as the SSDR software suite matures and gives better functionality for my particular style of contesting. This Direct Sampling architecture is here to stay and no doubt in the not too distant future huge expensive radios with zillions of knobs will be a thing of the past.

80 Meter Quarter Wave Vertical Antenna

John GW3VVC

You'll find lots of information on the web about vertical antennas. Some people who put up verticals are disappointed with the results, not realising that with this sort of antenna a really good ground is very important, after all the antenna is really a vertical dipole, the ground making up the missing half. When properly erected and configured a vertical can give a dipole a good run for it's money – and in some cases can actually work better – especially for dx where the low angle radiation of the vertical may get your signal further. Don't worry if you don't have the means to erect a ~65' vertical for 80 meters, it needn't be perfectly vertical, it can be in the form of a sloper, my 80 meter vertical is not really a vertical at all…

I have a pole bolted onto the rear gable end of my house, the top of which is at about 45 feet, that leaves me 20 feet short. To get the wire away from the house I run it down from the top of the pole and away from the house at an angle to a point about 25 feet from the house. This gets it a bit further away from local mains interference inside the house and conveniently makes it just a bit longer. The length is still a bit short so the antenna needs to be electrically lengthened or 'loaded'. Now probably the first thing that most people would think of is to wind a coil and place it at the feed point i.e. the bottom end. While this will work a better way is to put a capacity hat or top hat at the top of the wire. Doing this involves joining 2 or 3 pieces of wires of equal length to the top of the vertical, ~20 – 25 feet long in my case, and bringing them down at ~45 degrees to any convenient supports, the angle really isn't that important. The antenna then looks a bit like a letter T with the two horizontal bits drooping down. Calculating the actual length of the top hat wires is very difficult as it depends on a number of variables so the figures given should be a good starting point.

At the bottom of the antenna (the feed point) I have knocked a length of pipe into the ground, the exposed portion sticking up ~18 inches. I then obtained a waterproof junction box from B&Q for about £3 and fixed this to the pipe with a couple of plastic tie-wraps. Through the top of the box I put a screw to which the vertical wire is connected using a solder tag, a nut and washer on the inside secures the screw. At the bottom of the box I have an SO239 co-ax socket. A short piece of wire inside the box connects the screw at the top (solder onto the actual threads or use a solder tag under the nut) to the inner on the SO239 at the bottom. On both sides of the box I have fitted plastic terminal posts, obtainable quite cheaply from Maplin or eBay. A short piece of wire connects the terminal posts internally to the actual body of the SO239. Again solder to the body of the SO239 or use a solder tag under one of the fixing screws. You'll need a good ground rod, as near as possible to the vertical's feed-point. Connect this to one of the plastic terminal posts on the side of the junction box with a reasonably thick wire, the braid from an old piece of thick co-ax is fine.

Now connect an Antenna Analyzer to the SO239 socket at the bottom of the junction box with a a short length of co-ax cable. Tune around 80 meters until you find a dip which will indicate resonance. Don't worry too much about the actual swr, you're not measuring the swr, you just need to find the frequency the antenna is resonant at. If the antenna is resonating below 3.5 mc/s (bottom of the 80 meter band) it means it is too long in which case you'll need to drop the vertical (mine is held to the support pole with a length of cord and a pulley) and prune a small amount, maybe 6' off the ends of both your top hat wires. Pull the vertical back up and check with the Analyzer again. It should have moved up in frequency by a small amount. You're looking to have the antenna resonating within the 80 meter band, exactly where is not important. Should resonance occur above the band the top hat wires are too short and will require lengthening but with the figures given that should not happen, you can fine tune it later on, cutting is a bit easier than adding.

80 Meter Quarter Wave Vertical Antenna ctd...

Theory tells us that the feed point impedance of a dipole at resonance is about 72Ω. We're used to seeing values of nearer 50Ω or even lower, that is because the 72Ω figure is a theoretical value which would only be realised in free space i.e. very high above ground and in the clear. The feed point impedance of our quarter wave should be about 36 ohms – it is after all half a half wave… However again as it is near the ground and not in free space it's actual impedance will be less – maybe 20 Ω. Now when we checked the swr you may well have been pleasantly surprised to see it was around 1.2 or 1.3:1 which equates to an impedance of about 40Ω and it is here that we may have to revisit our aerial theory… If the antenna impedance is around 20Ω why is the swr only 1.2:1, we really should be seeing an swr of around 2:1 Well quite simply because the ground resistance is in ***series*** with the aerial's resistance, 20Ω plus something = 40Ω, so the ground resistance is also 20Ω. In this instance half the power is radiated, the other half ensures the local earthworms stay warm and cosy. Some of you may have noticed that I have quietly jumped from using the term impedance to resistance. The two may not be the same but in this instance we can cheat a bit – and get away with it...

Now we know that with the above figures, if our transmitter puts out 100 watts, 50 watts are actually radiated. To increase the system efficiency and radiate more power we need to reduce our ground losses by decreasing our ground resistance. The best way is by putting out radial wires fanning out from the antenna feed point, like spokes on a bicycle wheel, and connect them to the terminal posts on sides of the box. The theory books tell us these radials should be a quarter wavelength long. Cutting these exactly to size is a waste of time as once on the ground they become detuned. Just use wire of any length, 30, 40, 50 feet whatever you have to hand. To bury or not to bury is the next question. From past experience I have found that radials work best when they are a few feet above ground however they can be buried but only an inch or two below the surface. Doing this is easy, push a spade vertically into the ground then rock it to and fro a couple of times forming a narrow slit into which the wire can be pushed. In a few weeks the grass will have grown and it will not be visible. My back garden is full of radials and they're totally invisible!

As you lay down more and more radials your swr will ***increase*** – don't worry we may just have to revisit the theory books again to understand what is happening. As we increase the number of radials we reduce the ground resistance. Now as we have already found the overall system feed resistance is the total of the vertical's resistance and the ground resistance, reducing the ground resistance by adding radials decreases the overall resistance, taking it down from the 40 ohms we previously had, to maybe 35 ohms. So we have the situation whereby as we add more radials the percentage power radiated is increased making our antenna more efficient - but our swr also increases!!! Whilst adding radials you may find that once you get the swr up to around 1.5 or 1.6 to 1 adding any additional radials will not make any real difference. I have found that 10 – 15 radials is the ideal. You can keep adding more but the swr may not alter appreciably and any gains you make will be minimal.

Now adding radials may move the antennas resonant frequency slightly, probably bringing it down in frequency, so when you're happy that you have the radials sorted you can slightly alter your top hat wires to get the antenna's resonant point exactly where you want it. Incidentally if you can't get all your radials connected to the two terminal posts, connect them to terminal blocks or chocolate blocks (available from B&Q) and connect these via short wires to the terminal posts. A good source of wire for radials is old mains wire, remove the outer covering and you have two – or maybe three single lengths. Solder shorter pieces together and they'll work fine. Leave the insulation on the actual radials.

If you're a bit short of 'real estate' as the Americans say, a vertical could have you putting out a decent signal, it will cost peanuts and it's a great weekend project and may just help you understand some basic antenna theory… see you on 80 - good luck!

The Practical Wireless 70mhz Contest 2015

Simon 2W0CHV

With the promise of good weather, I decided to take part in the 2015 Practical Wireless 70mhz (4 Meter) Contest. Saturday afternoon was spent putting together a HB9CV antenna for the band, sorting out equipment and familiarising myself with the rules published in the September issue of Practical Wireless (PW). However, by Sunday morning I had a slight problem; I had no clue of a suitable location for VHF. After a few suggestions I decided to try high ground North-north-east of Rhosgadfan, which I believe has been popular with CB'ers for many years. At 260 metres ASL this site has stunning views overlooking Caernarfon Castle, Anglesey, the Menai Strait and the Irish Sea.

On arriving at the site I started to construct the station, a rather modest affair consisting of the following: HB9CV antenna mounted on three sections of an old telescopic 'fishing pole', a Trio TS120v on 28mhz which is used as the intermediate frequency (IF) to drive a Spectrum Communications transverter, delivering approx 25 watts on 70mhz. For FM courtesy of my lovely new fiancé Beth, I had my new Wouxon KG-UV950PL which covers, 6m, 2m, 70cm and 4m, with an output power of around 50w. The power supply was an 88ah leisure battery. Whilst setting up, it was a great pleasure to meet Andy MW0KLW who called by to see what I was up to.

The shack ...

The contest ran from 12:00 until 16:00UTC on Sunday 27th September and throughout the whole afternoon I enjoyed blue skies and warm sunshine, what a change compared to Summer! For those of you experienced in contesting, you are likely used to a fast pace with concise exchanges of information, however on 70mhz things are usually somewhat different. First of all 70mhz suffers from prolonged fading (QSB) and at times it can take several minutes to complete the exchange of information. Also 4 meters is known as the gentleman's band and in this contest it lived up to that title, with people looking to spend a minute or two chatting, exchanging names, discussing equipment and even the weather!

So how did I do? Not great with only 12 qso's in four hours, but it really was a fascinating and enjoyable four hours. First of all I enjoy the challenge of working through the QSB, with stations being 5/9 one moment and then disappearing mid QSO before reappearing a couple of minutes later, still calling me to complete the contest exchange. Secondly I completed 3 of the 12 qso's on FM, one of which was with a station in Northern Ireland; not bad considering the horizontal polarisation of the antenna.

The Practical Wireless 70mhz Contest 2015 ctd:

I had no problem working station's heard to the North, South and West of me, but to the east was a different story; this is a real pity as from experience I know that there are an awful lot of station's active on 4 meters in the Midlands and South-eastern England. So what was the problem? Quite simply the bulk of the Snowdonia mountain range towering above me was diffracting and attenuating my VHF signals, something which is not such an issue at HF, but which is a real challenge at the higher frequencies. So how did I manage to work a couple of stations to the East of me? Simple really, I beamed North-East towards the mountain known as Cefn-du, which is 441 meters ASL; somehow I could then hear signals from the midlands and indeed work a couple of them. Listening to signals via this method, the stations being received sounded as if the operator was gargling with water, scotch or whatever their own personal choice of poison may be!

The shack and antenna ready for action, now where has the operator disappeared to?

(Photo courtesy of Andy MW0KLW).

So in conclusion, 12 completed QSO's with stations in nine separate Maidenhead locator squares; including G, GW, GM, GI and EI. In terms of improvements to the station itself I believe a better antenna would help, perhaps a 3 or 4 element beam and maybe a dedicated vertical antenna for FM.

I also think that there could be better sites for VHF operation locally which would give me improved take off towards a wider area of the UK, however it is an inevitable fact that unless the mountains can be moved VHF will always be a challenge from this area; a challenge which I believe I will continue to enjoy! Oh and next time I must not forget my chair, four hours sitting on the floor is not comfortable!

Thank you..

The editor would like to thank the following who contributed articles or pictures for this issue of the Dragon's Voice: John GW3GUX, Les MW0SEC, Stewart GW0ETF, John GW3VVC, Patrick MW0PAD, Bryn MW6DZO and John MW0JWP.

Training Success

Picture from John MW0JWP

On the 26th and 27th September, the training team at Dragon Amateur Radio Club ran a Foundation Course and great news, all three candidates passed! So congratulations to John, John and Kevin on joining the amateur radio family, hopefully we shall see you all joining DARC. And finally, a big thank you to our training team for giving up your own time to help people progress in the hobby.

High Altitude Balloon Flights

Web address supplied by Patrick MW0PAD

An enjoyable account of an Amateur High Altitude Balloon Flight which was launched on Saturday 27th September from the National Hamfest site can be found at:

http://www.amateurradio.com/hamfest-hab-flight-mission-debrief/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+amateurradiocom+%28AmateurRadio.com%29

Lightning Arrestors

Bryn MW6DZO

This information is provided so that any member with an interest in joining in a bulk order via the club can take a look at the specification of these arrestors, and weigh up the cost/risk/benefit for themselves.
I know there are cheaper arrestors on the market (Ebay, MFJ etc.) - but this is the only product I can find with a comprehensive data sheet and a stated guarantee of performance.
Anyone with an interest, please contact Bryn Smiles (MW6DZO) on 07502 024 524 or by email bryntechie@gmail.com
When there is agreement that we have all the orders we are getting from members (by Monday 2nd November) an order can be put together.

Terms : Cash in advance of the order - will be collected at the club and a receipt given.
Delivery : Normally five working days from date of order.
Distribution : To be collected by members at the regular meetings."

Regards,
Bryn.

(Bryn has kindly given me the data sheets for the above mentioned lightning arrestors. I have added them as an attachment to the same email as this newsletter).

Caption Competition

This picture has just been sent to the editor by MW0PAD and whilst not remotely connected to amateur radio I thought I would include it!

The challenge is this, I want you to come up with a headline which would appear with this picture in a newspaper article, the headline that makes me smile the most will win a prize (bar of Cadbury chocolate).

You can send your entries to m3set@yahoo.co.uk no later than 31st October.

Good Luck!

Gwybodaeth am y Clwb / Club Information

- Cynhelir cyfarfodydd y clwb yn Neuadd Ebeneser Lon Foel y Graig, Llanfairpwll ar Nos Lun y cyntaf a'r trydydd yn y mis am 7.30 ar gyfer 8.00 o'r gloch. Croeso I ymwelwyr ac aelodau newydd.

- Club meetings held at Ebeneser Hall, Lon Foel y Graig, Llanfairpwll on the evening of the first and third Monday in each month at 7.30 for 8.00. Visitors and new members always welcome.

- Pob gohebiaeth at yr ysgrifennydd. All communications to the Secretary, Stewart Rolfe GW0ETF QTHR. Tel 07833620733. email: gw0etf@btinternet.com

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Aelodau / Members: Neil Adam 2W0CZU, Allan Doyle 2W0YLE, Cliff Nicholls 2W0CBZ and Simon Taylor 2W0CHV.

We are on the web…

http://www.radioclubs.net/dragonarc/
http://www.dragonarc.org.uk

Issue number 109, will be issued in Ionawr / January 2016. Any material for inclusion to be sent to the editor.