



RAGCHEW

MAY 2017

FROM THE EDITOR

Some of our long-term members will have realised that the call sign G8UXP mentioned in the Archive page of April's newsletter is none other than Alan G4MGW.

Thank-you to those members who responded to my plea for material for this issue of "Ragchew": Malcolm G6UGW has further thoughts on the Scanner Days, Anne 2E1GKY reflects on her 20 year membership of GARES and once again Tony G4HBV discusses the topic of Interference. "From the Archive" features material from the Club newsletter of 30 years ago - May 1987 to be precise.

On the operating side I have been fortunate to catch a couple of openings on 17m enabling me to add to my SSB score, but as the current standings show, during these times of poor conditions the digital modes and CW come into their own.

During a visit to the Isle of Wight in April with the Crash Box and Classic Car Club of Devon, Leta and I visited Alum Bay and the Needles. Pulling up in the car park I spotted a tent and a vertical mast with antenna attached. It turned out to be members of the Isle of Wight Radio Society operating GB0WMD to celebrate International Marconi Day.

Although I have yet to work any Sporadic E on 6 metres this year it would appear that the band is slowly coming to life so hopefully I will have something to report in the next issue.

We have just had an interesting talk at club by Tim Kirby G4VXE on Amateur Satellites which was extremely well received by the members and visitors, and has triggered me to feature AMSAT-UK in our Special Interest Clubs feature.

So what have you been up to in the shack? Do let me have your inputs particularly any juicy DX worked or even stories of the ones that got away.

CONTEST ROUND-UP

Club members are continuing to support various RSGB HF and VHF contests. At the time of writing GARES is in 13th place in the 80m Club Championship - just one place ahead of CARA. Credit goes to Bob M0NQN who has put in consistently good scores on Data Modes, also Gary M0XAC who has entered scores on Data Modes, CW and SSB.

On the VHF front we are currently in 24th place in the Overall UKAC table with entries from members on 6m, 4m, 2m and 70cm.

Can I put in a plea - even if you work only a few stations - **please put an entry in!** Your score will add to the overall GARES total.

Monday 21st May

Informal and General Operating

With any luck the weather will have warmed up and what better way to spend an evening than operating outdoors? We have the field at school at our disposal and is of course ideal for trying out any new antennas.

GB4GLM - Saturday 17th June

To celebrate Museums on the Air, GARES will be operating GB4GLM from the Gloucester Life Museum (to old Gloucestersians the Folk Museum) in Westgate Street. The station will be on from approximately 10.00 - 16.00 and any help setting up, operating and dismantling will be much appreciated.

GB4GHF - Saturday 2nd September

This is to coincide with the two week Gloucester History Festival and will also take place from the Gloucester Life Museum.

More details to follow.

Bits for Homebrew VHF/UHF Antennas

I've recently discovered this web site:

<http://aerial-parts.co.uk/>

You may find this useful!



**Leta G4RHK with members of the Isle of Wight Radio Society
Operating GB0WMD at Alum Bay on Saturday 25th April 2017**



G4CIB/P operating from Lundy, September 2016

2017 operating dates September 9th - 16th

From the Archive

The following appeared in the May 1987 Club Newsletter - 30 years on and I can't really believe I wrote this!!!! - Ed. The editor then by the way was Tony, G4HBV

May 1987 Newsletter

"A recent GARS Newsletter (plus some prodding from the Editor) has prompted me to put pen to paper regarding "Aerial Fashion" (you will note "Aerial" not "Antenna" - very non-U).

Of course the fashion was not just the type of aerial, but the manufacturer. A 5/8 wavelength had to be a Bantex, British of course - and none of this namby-pamby gutter mount or mag mount: a good solid hole (*eh?*) in your car, sorry, motor, was required.

The Halo likewise had to be a J-Beam, the Squalo never really caught on, it was, well, rather square.

Yagis too were J-Beam, Antennes Tonnes or some such Continental shodderly had not yet crossed the Channel. Certain 144MHz AM stations from France were heard (or even worked) during lifts in spite of using some inferior frog rubbish.

The DLs heard on 144MHz AM were much more solid, obviously some Teutonic ironmongery was being used - but still we told them that we were using an 8 ele J-Beam. German shipyards, crane and shipbuilders (eg Krupps) were familiar with I beams but J-Beams were lost on them.

Whilst on the subject of style, I recall a Cheltenham Amateur (sadly now deceased) who, when operating from his car, was "motoring in Cheltenham" or wherever. Yes there was style, not for him the mundane task of driving.

Sadly elegance is no longer common in amateur radio - perhaps GARS members can lead the way back to the "amateur spirit".

G4CIB, Brian (with tongue firmly in cheek)

Editors note (G4HBV) : Isn't it always nice to see someone with xenophobia worse than yourself. Incidentally, I always considered that "motoring" was done at weekends whereas driving was a weekday occupation."

Also the following obituary appeared in the same issue:-

"It is with sorrow we have to record the untimely death of L.O. Rogers G2HX (Owen) as a result of an accident in his garden. Owen was a Life Member of Gloucester Amateur Radio Society and held the post of Technical Officer for a number of years. He had been licensed and a member of the RSGB for over 50 years. His early amateur radio interest was in working rare DX on CW with home-brew equipment from his home, then in Painswick. Subsequently he became interested in experimenting with new developments - SSB and RTTY, and of later years with ferrite antenna tuners and wire aerials. He was always ready to help any amateur and will always be remembered for the many interesting talks he gave to our society over the years. His activity recently had been confined to the local Sunday morning Top band net. He is survived by his widow Audrey, his son David and grandchildren, to whom we extend our deepest sympathy. Owen will be missed by all who knew him .

G3MA"

Special Interest Clubs

No 4 - AMSAT-UK

The first amateur satellite OSCAR 1 (Orbital Satellite Carrying Amateur Radio) was launched in 1961 and was the creation of a group of Californian radio amateurs. A summary of the OSCAR satellites can be found on:-

<http://www.om3ktr.sk/druzice/history.html>.

The AMSAT organisation was formed in the U.S.A. in 1969 to foster Amateur Radio's participation in space research and communication. AMSAT-UK was formed soon after and started with an occasional newsletter. For many years the public face of AMSAT-UK was the larger-than-life figure of Ron Broadbent G3AAJ. I can do no better than quote from AMSAT-UK's web site highlighting the invaluable contribution made by Ron in establishing the group:-

"This modest start created great interest and therefore more and more demand on the time of a handful of volunteers then involved, until in 1978 the whole ad-hoc arrangement was swept up into a coherent whole by Ron Broadbent G3AAJ who agreed to take on the job of an Honorary Secretary.

During his first year it became apparent that AMSAT-UK had been blessed with a real worker. During the next sixteen years (1978-1994) he steadily, and virtually single handedly, built up the organisation into a world respected body dedicated to fund raising for amateur satellites."

Ron's energy was boundless and when he retired from Trinity House in 1985 - he was involved with lighthouses and lightships - he devoted his energies full-time to AMSAT-UK. As a result of this tireless work Ron was awarded the MBE in 1995.

So what of AMSAT-UK today? Their web site may be found on <https://amsat-uk.org/>. Membership is open to all with an interest in Amateur Satellites and starts at £15 for which you will receive via download a quarterly copy of "Oscar News". If you require a printed copy to be posted the annual subscription is an extra £3.

The web site contains a vast array of information with a comprehensive section devoted to beginners. As Tim G4VXE pointed out in his recent talk to the club - you can listen and work through satellites with very simple equipment - a Baofeng handheld and a small beam will get you started.

On a local note, Graham G3VKV is a very keen satellite operator and I'm sure will be pleased to give advice should you meet up with him on 2m.

RF NOTES BY TONY, G4HBV

At least a couple of members have ongoing problems of interference of one sort or another. I thought it might be a good idea to deal with some background material in the next couple of "notes".

First we need to look at some basic properties of antennas and fields. Antennas radiate because of the RF currents in their elements. This is a natural process we don't need to go into here. We observe this radiation by the presence of fields, both electric and magnetic. In the radiation zone the two fields are interlinked, being at right angles to each other and to the direction of propagation. Also in the radiation zone the energy in the two fields is lost to the transmitter as the fields move outward from the antenna.

However, closer to the antenna there exists other fields - electric and magnetic induction fields which do not move outwards and return their energy to the antenna. There is a boundary in the space around an antenna inside which these induction fields are stronger than the actual radiation field; within this boundary we talk of "the near zone" of the antenna. Unfortunately there are two definitions of where the zone boundary lies, but we needn't go into this here because there is no sudden changeover in energy levels between the induction and radiation fields. The gradual change to a radiation field stronger than the induction fields takes place in what is called "the intermediate zone".

I believe that the majority of interference probes are caused by induction fields, particularly the electric induction field and this applies to transmitter-generated problems and amateur receiving problems. In the 30-300 MHz range the near zone boundaries will typically be in the range 0.5 to 10 metres, but the intermediate zones can extend to 20 metres or more. You can see that these distances are going to be experienced in most built-up areas. It is interesting to calculate the free-zone boundary, for then we will know that the induction fields will exceed these values.

At 10 metres distance a 20 watt transmitter with an omni-directional antenna produces around 2 volts/metre, whereas a 100 watt transmitter produces 7 volts/metre. These are of course very high field strengths. A 144 MHz transmitter might well have a spurious output specified to be minus 60dB below its fundamental. Let's assume that the transmitter has such a harmonic lying in the TV UHF band - what signal level would appear on a TV antenna in the transmitter's antenna near zone? For the two field strength levels just calculated the signal levels would be around 500 and 200 micro volts respectively - more than enough to be an interfering signal. So extra filtering will be required to prevent this caused interference.

As well as our transmitter producing very high field strengths locally, the other side of the coin is that there will be little or no screening of computers, TV's and other household gadgets, which will leave them susceptible to RF fields and also likely to produce interference themselves. This is the price we have to pay for "cheap goods". The difficulty with interference problems is that the owners of such household gadgets will naturally think that their equipment is not at fault in any way.

What can be done to counteract this? There are basically three methods: shielding, filtering and spatial separation. In addition where transmitters are at fault there may be scope for power reduction. If there are receiving problems due to local noise then a separate receiving antenna using the magnetic field component is likely to reduce this. One thing I ought to mention is the use of grounding rods - these only have any use in the HF bands but they should be prevented from acting as 50Hz safety earths (which could be dangerous) by using a series isolating capacitor. This should be capable of withstanding full mains voltage, say a 600V AC or 1000V DC rating but capable of passing RF without significant loss. A 5000 pF mica capacitor of that rating would be ideal, but where you would get one nowadays I couldn't say. Second best if you are unable to get such a capacitor would be a class Y suppression capacitor.

Editor's note: I am sure all the members will wish me to thank Tony for his interesting and informative articles. Interference is an ever evolving problem. When I was first licensed in 1969, TV and audio equipment were prone to breakthrough from 2m AM transmitters particularly if you were running high power. Some TV antennas had masthead pre-amps (usually wide band) which was another cause of problems to any local amateurs. Nowadays we have to contend with the emissions from the sheer volume of household gadgetry. As always the amateur radio fraternity will find a way around these challenges!

Photos from the Archives



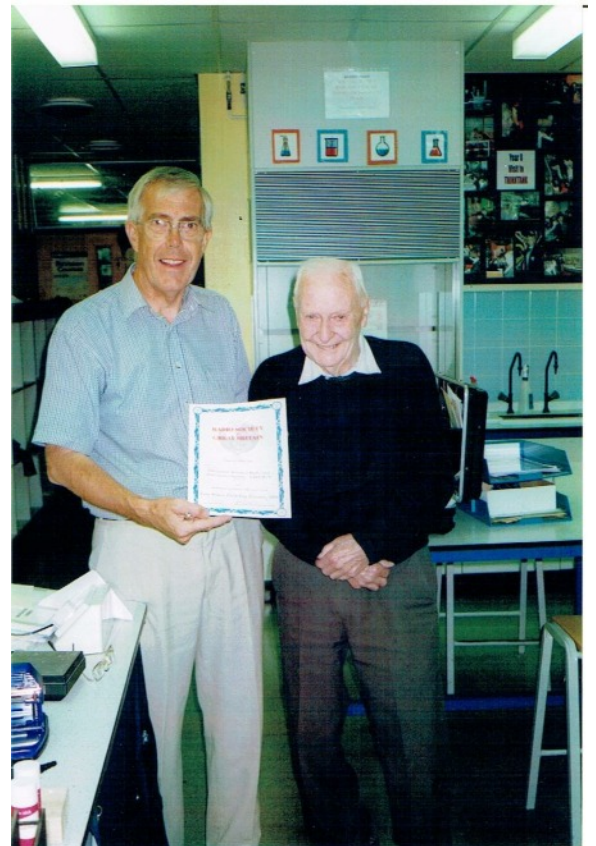
NFD 1983 - Gordon League Rugby Ground, Hempstead

L-R: Bob?, Derek G4KFG, Frank G5BM, Steve G4HFT, Ian G4CLR, Jack Newitt, Pat G3MA, Brian G4CIB and Tony G4HBV



NFD 1986 - Gordon League Rugby Ground

Tony G4HBV and Brian G4CIB



G4AYM/P came 2nd in the Low Power Field Day 10 W Portable section 2005.

Operators Brian G4CIB and Pat G3MA with the Award Certificate from RSGB

Digital Speech using 'Continuous 4 level FM' (C4FM)

The following is intended to be a quick and simple guide to digital speech, as used by a few GARES club members who own YAESU rigs (e.g. FT991). It's not trying to be a 'technical' article, so I'm not making comparisons with PSK (Phase Shift Keying) signals, nor will there be any IQ constellation diagrams to dazzle and confuse. However, if these few words whet the appetite of anyone else who might decide to give this mode 'a go' then great.

Why does C4FM exist?

With weaker signals, digital can be easier to hear and understand. This feature has been widely embraced in the public safety and private business sectors that use two-way radio technology. However, System Fusion is considered 'amateur friendly' providing a simpler interface. It's called 'Fusion' because of its backward compatibility with analog FM, so, for example, someone using FM could 'break in' to a C4FM conversation as long as AMS was enabled (see below for 'AMS'),

What is C4FM?

System Fusion is Yaesu's implementation of Digital Amateur Radio, utilizing C4FM 4-level FSK Technology to transmit digital voice and data over the Amateur radio bands. C4FM is a type of FSK, so symbols are separated in frequency. The four symbols (named +3, +1, -1, and -3) each convey two bits of data (see table below). As the Symbol rate of the equipment is 4800 symbols/sec, and as each symbol is 'worth' two bits of data, the resultant data rate works out at 9600bits/sec. Transitions between symbols involve changes in frequency only, so the resulting signal is one of constant amplitude. And because the amplitude stays constant, a non-linear FM transmitter can be successful.

C4FM Mapping

Dibit	Symbol (dB)	Freq Deviation
0	1	+900 Hz
1	3	+2700 Hz
10	-1	-900 Hz
11	-3	-2700 Hz

What does the FT991, in particular, offer in respect of C4FM?

The following options can be selected by the user:

- **FT991 Display - DN:**
V/D Mode: (Voice/Data) for Simultaneous transmission of Voice and Data. (Note: It's twice the rate of D*Star).
- **FT991 Display - VW:**
Voice FR Mode: Full rate voice using full 12.5KHz bandwidth.
- **AMS Mode (Automatic Mode Selection):** selection of this function allows instant recognition of digital mode or FM, and enables mutual communications.

GM (Group Monitor): this function allows on screen checking of group members who are within range.

So, with all that in mind, how are those of us who are currently learning (playing!!) with C4FM using it?

As a starting point, we've set up a 'group' using the GM function, and doing that allows us to see each other call-signs on the FT991's screen, and the associated distance (in miles) and orientation to each group 'member'. (Although this location info' will only appear when in DN mode (part data, part voice). The benefit of this 'group' is that only those 'registered' within it can communicate with each other. This system allows the group to know whether users are in, or out, of range.

Disclaimer: I've tried to ensure accuracy with the above article, but if anyone spots errors, feel free to put me straight. Anyone wanting further info' can chat to me (G4IZZ), Gary (MOXAC) or Barry (M6UBJ).'

Mike Eggleton G4IZZ

Celebrating 20 Years in GARES

By Anne 2E1GKY

My Interest in Radio has been on going for over 50 years when I used to watch my Grandad tuning along the Bands which then was mainly Long and Medium Wave.

I then moved into Short Wave interest learning to tune with a beat frequency oscillator (BFO) and at the time wondering just what that was!! I joined the International Short Wave League (ISWL) becoming G.20126 and am still a supporting member.

I joined the RSGB in August 1985 when in those days one had to be recommended for joining and in this case my CB/Amateur friend Roger Provins G0RGJ put my name forward and also helped me with some construction work in readiness for the Intermediate Exam.

CB Radio was an excellent learning curve for transmitting and I had handhelds and base sets and different antennas, one which looked like a ships sail. The Tandy shop was a magnet for me.

In about 1997 I decided it was about time to join the very last RAE Course at Gloscat, The Park Cheltenham under Terry Adams G4CHD and this was every Thursday from May to September and I tried the RAE but alas found it far too difficult.

Then to get over that disappointment but still being very interested in Amateur Radio I joined GARES.

Here I have to say I was welcomed with open arms by Brian G4CIB who was then the Chairman. Also Tony G4HBV also helped me. Vernon became my Mentor and certainly put me through my paces,

I managed to get in to the very last Intermediate Exam at Gloscat, The Park and was successful and I am still very delighted to have got my City and Guilds Pass Certificate which is proudly hanging framed in my shack.

I am very devoted to GARES as a Committee Member/Exam Secretary etc. and this way I can be thanking them all for their steadfast help with someone who is sometimes not too sure of the higher tech items!!!

My thanks must surely go to Brian G4CIB and Vernon G0HTO for making this all possible.