



**RAGCHEW**

**DECEMBER 2018**



## FROM THE EDITOR

Firstly many apologies for no "Ragchew" appearing in November - personal circumstances have left very little time for any amateur radio let alone putting one together. Combined also with a lack of material to publish, I am finding it difficult to produce this newsletter on a monthly basis so from the beginning of next year I am planning to make "Ragchew" bi-monthly - unless of course you overwhelm me with articles! So how about a New Year resolution to write an article for "Ragchew"?

In this issue **Tony G4HBV** explores ideas that never worked. Over the years many products have been sold to the general public on the basis of dubious science and amateur radio is no exception. This month he has a close look at the Crossed Field Antenna.

Another interesting article from **Tom G3XMM** on one of his favourite subjects - Morse keys, this month featuring a product of the Marconi Company.

In response to **Tony G4HBV's** RF Notes article in the October "Ragchew" **Malcolm G6UGW** wrote a response which I have reproduced in full in this issue.

A few weeks ago, Leta and I spent a few days in Falmouth and we took the opportunity to visit the **National Maritime Museum**. A very interesting exhibition "**Titanic Stories**" is on until January and well worth seeing, also an interesting display of the radio equipment used by Sir Robin Knox-Johnston on his single-handed non-stop circumnavigation of the globe.

And finally members are welcome to visit the club's Facebook page set up by **Dave G4HJV**. This is a new feature and hopefully will bring the activities of the club to a wider audience.

**G4CIB**

**The Editor wishes**

**A Happy Christmas**

**and**

**A Peaceful and Prosperous**

**New Year to all GARES Members**

**and their families**

## CHRISTMAS & NEW YEAR HOLIDAY TASKS

**By Brian G4CIB**

How about visually checking all the batteries in your various bits of equipment, particularly those that you do not regularly switch on? A check now could save some corroded battery holders in the future.

And what about those rechargeable batteries that having been lying in your drawer for ages? Worth a check!

When was the last time you re-validated your licence? Can't remember? Better check to make sure you still have a licence!!

How about writing an article for "Ragchew"?

An item in the **December QST** magazine (the monthly magazine published by the **ARRL - American Radio Relay League**) reminded me that although many amateurs enjoy operating /P during the summer months, the challenge of operating /P during winter conditions is equally rewarding. So how about a /P outing over the Christmas break? I will be out walking on Boxing Day and will be monitoring 2 metres both on FM (145.500MHz) and SSB (144.300MHz) and would be pleased to have a qso.

### Contest Update

A dedicated band of members have been submitting entries into the **VHF UKAC** Tuesday and Thursday evening contests and the club is currently in 22<sup>nd</sup> position in the Local Clubs table. Interesting to note that in 2017 we finished the year in 24<sup>th</sup> place so hopefully we can keep maintain the improvement over last year.

In the **80m Club Championship** we finished in 14<sup>th</sup> place in the Local Clubs table, one place down in the table over last year. Well done to all who submitted logs - **Bob M0NQN, Gary M0XAC, Mike G4IZZ, Brian G4CIB** and **Tony G4CMY**.

Looking forward to next year we are hoping to take part in **National Field Day** on **1<sup>st</sup> - 2<sup>nd</sup> June** for the full 24 hours.

Also on the calendar for next year - **Low Power Field Day** on **21<sup>st</sup> July**, and **SSB Field Day** on **7<sup>th</sup> - 8<sup>th</sup> September**.



### RF NOTES by Tony G4HBV

Ideas that never worked ..... Over the years there have been many attempts to construct small (in terms of wavelength) antennas that would be efficient at radiating RF. One such was the Crossed Field Antenna, abbreviated to the CFA, which became the subject of much controversy in the early 1990's. It was the brainchild of the late M.C. Hatley.

Its origins can be found in the classical representation of a radio wave – a plane wave can be considered as oscillating electric and magnetic fields, in motion, and at right angles to each other and to the direction of propagation. Hatley's idea was to produce such fields individually at right angles in a unit so that they would combine and become an expanding plane wave of RF energy. The CFA was advertised in the RSGB magazine at the time and attracted some people who believed it worked – but there were many professional radio engineers who were dubious.

Let us first have a look at a basic arrangement of a CFA. Imagine two vertical cylinders positioned one above the other – these are the E plates across which the electric field is applied. In the space separating these two cylinders are positioned two circular discs, also one above the other – these are the D plates around which the magnetic field is developed. The D and E plates are supplied from the transmitter via a phasing unit. This phasing unit has two functions. It must divide the power from the transmitter into two equal parts which are then applied to the D and E plates. It must also provide a 90 degree phase shift between these two components.

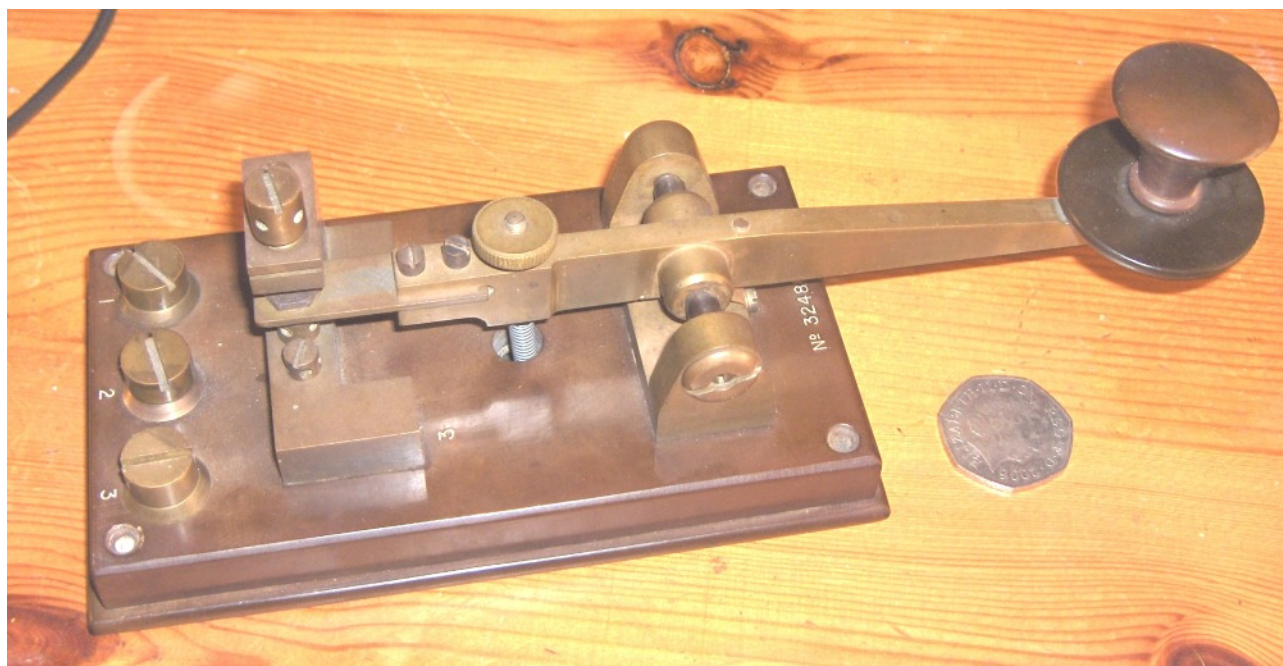
What follows is my own assessment of the CFA – that the concept was based on a flawed understanding of the nature of RF energy. A first point is that thinking about RF energy in terms of electric and magnetic fields is fine and has been extremely useful in radio engineering – but fields are NOT the CAUSE of RF generation; they are the EFFECT by which we observe the existence of RF. Since Quantum Mechanics became established a good few years ago, the explanation of RF radiation is that the rapidly changing current in the antenna causes electrons to change orbit in their wire molecules, releasing energy in the form of photons. This is an entirely natural physical process which we exploit by creating elevated conductors and passing rapidly changing (RF) currents through them. This energy is then REPRESENTED on a discernible scale by the constituent electric and magnetic fields of RF radiation.

The fields which the CFA superimposes would be induction fields; fields not moving in space and which return their energy to the originating circuit so this does not correspond at all to the classical representation. Also as both fields are cycling at RF, the electric field would have an associated magnetic field and similarly for the magnetic field and these would interact with the applied fields.

The adverts as I remember them made no mention of what happens in receive mode. Conventional antennas always have a relationship between their behaviour as transmitting and receiving antennas – governed by the laws of physics. If the CFA had operated in the conjectured mode there would be no reason why it would act as a receiving antenna. We know that RF can be generated other than by passing RF currents through antenna wires – the synchrotron radiation and thermal modes known to radio astronomers are examples of this which in itself is not a reason for dismissing the CFA however.

One of the practical lessons from my own “mucking about” with antennas is that even short bits of wire can generate RF and I suggest that this is what happened in the case of the CFA. It was subjected to independent tests against a reference dipole and showed no discernible evidence of significant radiation. It is an illustration of how the limitations of a mathematical model can lead to a false conclusion.

*(Editor's note: Many thanks for this article Tony - I'm sure all the members will join with me in congratulating you on submitting interesting articles during the past year)*



## Calling All Ships

The key shown in the photograph is an example of what has been described as one of the best straight keys ever produced. That is a matter of opinion of course but it certainly is a large and impressive piece of kit. It seems that keys of this general design with slight variations were produced by the Marconi Company on a contractual basis from the early 1920s onward. They were used by Trinity House in lighthouses and lightships, by the General Post Office in coastal and long distance stations such as Portishead Radio and by the Marconi Company itself to key their high-power short-wave beam transmitters when tuning-up. In addition it is possible that some of these keys may have found their way into radio stations in other parts of the world.

A drawing in the Marconi Company archives suggests that the design of the key dates from 1922. It was described as Key Manipulating, Large, Open Type and given two type numbers. The first, AS No.300, seems to refer to the keys supplied to Trinity House. The second, PS No.213, is associated with the keys supplied to the Post Office. The key in the photograph is made almost entirely from brass with ebonite base and knob and without later embellishments and modifications. Thus it is almost certainly an early PS 213. These keys were in service for 80 years or so with only one major update, the so-called Rugby key of 1983. About 90 of these were made by the Post Office as a replacement for the earlier keys some of which were sold off to staff members. In addition there were some in-house modifications over the years, the so-called Portishead modification of 1950 being the most significant. Comparatively few of these keys were manufactured so they have rarity as well as historical value. Time for another search in your cupboards perhaps?

Tom G3XMM

*(Editor's note: Many thanks Tom for submitting this article - always fascinating to read about the history of old Morse keys)*

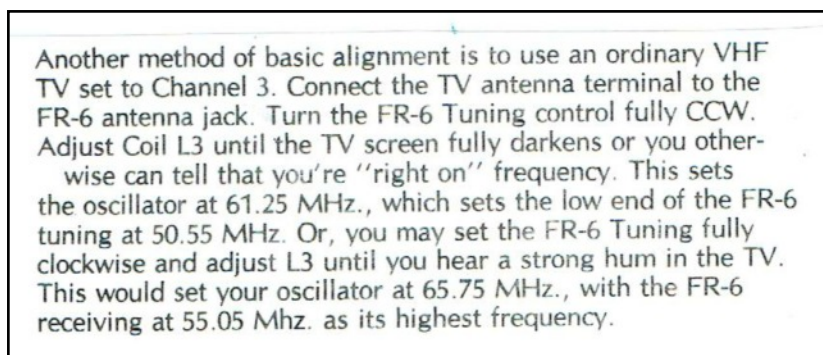


## From Malcolm G6UGW re Tony G4HBV's RF Notes article (October "Ragchew")

"Dear Brian

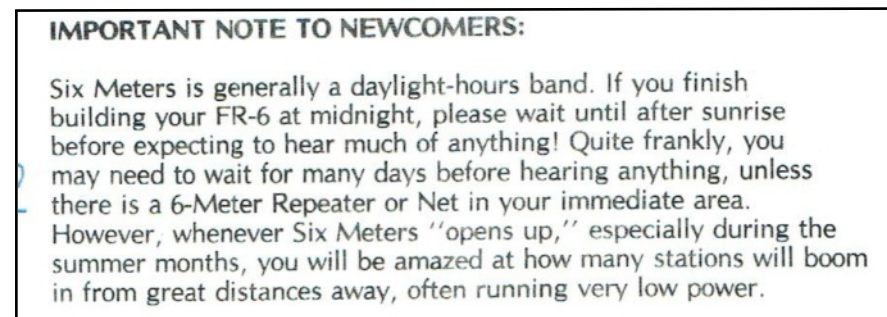
Ref: "RF Notes" by Tony G4HBV "Ragchew" October 2018 - 6 metres (50MHz). Thank-you for another interesting article. I have a few observations from my attempting to build a 6m receiver and my trying to listen to the FM section of 6m with a scanner.

1. The 6 metre band became available to British amateurs on the 1<sup>st</sup> February 1985 with an allocation between 50.000 - 50.500MHz. This particular band is also available to amateurs in countries in Regions 2 and 3 (including the USA). There the band covers 50.000 - 54.000MHz (ref "Scanners" by Peter Rouse 1987).
2. Tony G4HBV mentioning Band 1 TV. The Ramsay 6 metre FM receiver kit (produced in the USA) gave instructions on how to align the receiver using an ordinary VHF TV (see figure 1). Also figure 2 which I have enclosed is well worth quoting in full in the "Ragchew".



Another method of basic alignment is to use an ordinary VHF TV set to Channel 3. Connect the TV antenna terminal to the FR-6 antenna jack. Turn the FR-6 Tuning control fully CCW. Adjust Coil L3 until the TV screen fully darkens or you otherwise can tell that you're "right on" frequency. This sets the oscillator at 61.25 MHz., which sets the low end of the FR-6 tuning at 50.55 MHz. Or, you may set the FR-6 Tuning fully clockwise and adjust L3 until you hear a strong hum in the TV. This would set your oscillator at 65.75 MHz., with the FR-6 receiving at 55.05 Mhz. as its highest frequency.

Fig 1 - Aligning the Ramsay 6m receiver using a Band 1 TV



**IMPORTANT NOTE TO NEWCOMERS:**

Six Meters is generally a daylight-hours band. If you finish building your FR-6 at midnight, please wait until after sunrise before expecting to hear much of anything! Quite frankly, you may need to wait for many days before hearing anything, unless there is a 6-Meter Repeater or Net in your immediate area. However, whenever Six Meters "opens up," especially during the summer months, you will be amazed at how many stations will boom in from great distances away, often running very low power.

Fig 2 - A general note on the 6m band included  
with the Ramsay 6m receiver instructions

I well remember carrying my 6 metre receiver to Portsmouth to try and hear the 50MHz repeater GB3PD without success. What do I remember about this holiday? I needed to carry 29 AA cell batteries, 2 C size and 2 PP3 batteries to power the various radios I took. This was a never to be repeated exercise!!!

Thank-you Tony for the article and congratulations to Dave G4BCA for working K1TO.

Best wishes 73

Malcolm G6UGW

(Also 88 to Leta)"

*(Editor's note: Many thanks Malcolm for the feedback - I wish more members would respond to the articles published - hopefully you will start a trend!)*

## **PORTABLE STATION FOR THE WINTER CHALLENGE**

**Dave G4BCA**

With limited antennas at the home QTH, I've put together a 'rapidly deployable' station for portable operation in the car. I only have to remember three main items and these are kept ready for use and can be quickly loaded into the car when the opportunity arises. These are a box containing rig, ATU and other bits and pieces, a leisure battery and a set of AMPRO single band mobile whips for 40m to 15m.



The photo above shows one of the AMPRO whips mounted on the car at Barrow Wake. I find the use of several single band whips less of a compromise than a multi-band whip, and the latter tend to be fiddly to adjust when changing band. Apart from the 40m version, the FT-991 internal tuner will handle these antennas without any problems.



This photo above shows the 'station' on the back seat of the car comprising FT-991 and MFJ Travel Tuner (the latter only used for 40m). Note the Mini-Palm paddle which conveniently sits on top of the rig with a scratch-free magnetic base. The box contains everything needed for this type of operation (rig, magnetic mount, paddle, power cables, headphones, logbook and microphone for the rare occasions when I operate on SSB!).



Power is provided by a 12V 70Ah leisure battery. The FT-991 is able to deliver a maximum of around 75 Watts at 12 V (full output of 100 Watts needs a supply voltage of 13.8V). I tend to run the rig at 70 Watts and this enables several hours of operation.

One of my favourite locations for this type of operation is Barrow Wake, as shown in the photo. The take-off to the west is superb and it is very straightforward to work North and South America (best DX in this direction with this setup is probably VE7 (British Columbia) on 40m during the day. The east is more difficult but I have worked several stations in SE Asia and busted many a 'pile-up' on CW to work DXpeditions. The electrical noise level at the site is very low, apart from the occasional bit of ignition noise when cars go past to park.

The site is also good at VHF/UHF frequencies although I haven't yet set up anything other than a dual band mobile whip for 2m and 70cm.

*(Editor's note - many thanks Dave for submitting this article which I hope will inspire other members to write-up the details of their /P or /M set-up)*

### **Photos of the "Kestrel" Transmitter & Receiver used by Sir Robin Knox-Johnston now on display at the National Maritime Museum, Falmouth**

