Chelmsford Amateur Radio Society

Newsletter

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Next meeting: 7th June - 7.30pm, Oaklands Museum

The famous CARS table top sale!

Inside this issue:

Blue sky thinking from Jim, 2E0RMI, more on Marconi & the Hall St. Expo and lots more be-sides.

Value for money, or what?

Club Nets - Tuesdays 20:00h
Net Controller: TBD

#2 - GB3DA	14th June
#3 - GB3ER	21st June
#4 - 80m 3.756MHz	28th June
#5 - 160m 1.947MHz	n/a

Essex Ham Net
Mondays 20:00h GB3DA

Contact details for the newsletter: editor@g0mwt.org.uk

Editorial

Hello again, and welcome to the latest edition of this newsletter. This month, we see midsummer and the longest day. Hooray! Mind you, staying inside is OK when the weather is cold and wet, but only if you have projects or the bands are open.

After John's plea for information about Peter Crossley last month, he received this from Ken WIlkinson:

"Peter was within the Marconi Radar Drawing Office, spending time (along with many others of us) out at the Great Baddow Research Centre – as there was not sufficient room to house us at Writtle Road Works (WRW). WRW had what was called 'Portakabin City' as space was at a premium within the buildings – though we did have a fair few out at Great Baddow too. Many employees lived in Great Baddow, with a scattering out at Wittle too".

John says he thought it amazing to hear Peter actually worked in the Marconi Hut when it was at Writtle – it later became the changing room for the school where Jeff Hurst must have changed – then was rescued and transported to Sandford Mill. He also reports that Ken was an Engineer with what was Marconi at New Street and John met him with six licenced amateurs when he went there for Dame Nellie Melba's 90 year anniversary. They operated from Mark Sanderson, M0IEO's lovely caravan behind New Street factory. They were treated to lunch and a number operated GB90MZX from the caravan. When I enquired about Ken's background, John had an idea that Ken was licenced years ago. He took some of the photos on the website link written by John: http://www.g0mwt.org.uk/events/dame-melba-2010/dame-melba.htm

Owing to some last minute work on the Newsletter last month and the fact that I wanted to keep it down to 20 pages, some other material John supplied was squeezed out. He had taken some picturtes of Peter Watkins, M0HBY by his replica 2MT transmitter which, hopefully will be the subject of another article in the future. A preview is included further on below.

Thanks for all the information, John. Keep it coming! ***Ed***.

Dates for your diary

Please note, the dates may be subject to change...

Tue. 7th June	Meeting - Table top sale
Mon. 20th June	Skills Night, Danbury Village Hall
Tue. 5th July	Meeting - "Innovantennas" - Justin Johnson G0KSC
Mon. 18th July	Skills Night - Danbury Village Hall
Tue. 2nd August	Meeting - "Constructors Competition" - Carl G3PEM
6th/7th August	Sandford Mill BIG Weekend! An interactive historical extravaganza!
Mon. 15th August	Skills Night - Danbury Village Hall
Tue. 6th September	Meeting - "Millimetric Microwaves" - Chris Whitmarsh G0FDZ
Mon. 19th September	Skills Night - Danbury Village Hall
Tue. 4th October	Meeting CARS Annual General Meeting
Mon. 17th October	Skills Night - Danbury Village Hall
Sun. October 23rd	Science Discovery Day at Sandford Mill
Tue. 1st November	Meeting - 25 minute chats (not 25 @ 1min each…)
Tue. 6th December	Meeting - Christmas Social Evening

Re-distribution of once loved items… aka CARS Tabletop Sale

No time to lose - just a few more days before the next meeting on 7th June and our annual table top sale. Something to sell? Then book now; at just £3 per table (free to CARS members but donations accepted), there might just be one left. Maybe you have just passed your Foundation licence or Intermediate perhaps - then now is your chance to find that item you have been looking for. Not ham radio? Perhaps it is photographic, audio, or even computer orientated; none of these? That doesn't mean you won't find just what you want. You never know; don't miss your chance!

Owing to a number of bequests and a minor rationalisation of CARS equipment, there will something for everyone. So ,don't miss our next event on 7th June starting at 7.30pm. **Contact Colin** now for more info. g0trm@g0mwt.org.uk

We always used to call them junk sales when they held them during my first time round in AR.

How about we run a competition for the oldest, dustiest, dirtiest and most rubbish item to be offered.

We could also run one for the most desirable as well, but it wouldn't be half so much fun!

Ed.

Hall Street Exhibition - Marconi Radio Factory Mk. II

On Saturday and Sunday 14th/15th May I, along with other members of CARS was invited to assist young children in building AM radios from a kit of parts in a safe and controlled manner. The aim was to complete the task successfully, without injury, and perform a risk assessment for the activity.

Ed, G8FAX

Building radios in the world's first radio factory was something I thought I would never do, but with the Hall Street Exhibition running at the first Marconi radio factory and the foresight of Chris Neale and Ed Bye, G8FAX who made contact with me at one of the Skills nights, this became a reality. PAT testing all the equipment the week before was a bit tedious, but necessary, as it gave me time to ensure all the soldering irons and extension leads etc. were working, This was all boxed ready for action, Chris and Ed having sorted getting the radio kits from Rapid Electronics some weeks earlier.

Michael, G4NTV was charged with turning the radio educational packs in to individual kits for the young people to build, and what a great job he did in this.

Mike, G4NTV

Utilising an A4 sheet he laid out all the components in a manner that was easy to use with each item labelled. Each session was well attended and the children looked the part as each was given a white lab coat to wear; this really set the scene.

The only component that was deemed to be a little tricky to complete was the aerial and that was due mainly to the winding of 55 turns on the ferrite rod. This was where I stepped in with a coil winding gadget I made for a Scout Jamboree event back in 2004. At this event the scouts built some 750 of these kits in a week (it really felt like a job on the last day!) which made the construction of the kit a little easier.

The radios mostly worked first time, whilst others needed coaxing into life and our “Cheif Enginner” oversaw all construction…. All age groups and abilities were catered for, and no one went home disappointed. The last group was made up from the staff at the exhibition who had the last production run of radios made in the first radio factory in the world.

Over the two days we made some 35 radios; all worked, and every one had a great time. Thanks to Chris, Ed, Michael, Andy, Jack and Murray for getting involved in a worth while event, and the children for just being brilliant. As can be seen, they all enjoyed it.

Christopher Chapman, G0IPU

First you study form, then you watch the demonstration.

You get to use the tools and then, when the fabric of the building obscures the signals, you go outside to see…

Success!

Chris is pictured with Tom, the grandson of Peter Turrell MBE who is the Chairman of the Marconi Veterans Association and Pam Swaby, from Chelmsford Civic Society.

John Regnault's Earth-Moon-Earth Talk

John started his talk by outlining how he became interested in moonbounce techniques when he returned to Amateur radio in 2011 after a break in industry working on, amongst other things, high grade software for network security matters. In the early days of EME very large dish aerials were required and he spoke of an early pioneer, Peter Blair, G3LTF of Galleywood who was one of the very first amateurs to make a two way contact via the moon. On the evening of June 13th 1964 using a home-made wooden framed wire netting dish 15 feet in diameter on the end of his house and operating at 430Mc/s with 150 watts, he had a two way contact with KP4BPZ in Puerto Rico by both bouncing their signals off the moon. One hour later they made contact again and signal reports were RST 459 both ways. In contrast, the aerial at the other end of the link was a radio telescope dish 1000 ft in diameter located at Arecibo and fed with a 3kW signal. It was a talk by Peter, G3LTF that inspired John to investigate the further possibilities of EME for himself and he stays inspired to this day.

(*The writer remembers seeing the dish in a Galleywood garden (above, right) but did not appreciate at the time just what new frontiers were being breached and that it was at the forefront of the then current technology. The next time I saw a dish anything like it was the one on top of Marconi House in New Street where it was being used for propagation tests, eventually being used to communicate with distant North Sea oil rigs*.)

John explained his many successes in making contact with like-minded amateurs, but success does not come easily. There are many difficulties to be overcome; propagation is a problem. Getting as much metal as possible into the sky is an important factor and with any such system, cross polarisation plays a major part. One can never be sure how the angle of signal will change between leaving the transmit antenna and being reflected back from the very uneven surface of the moon; at each point it will be different.

This change cannot be predicted and if a second station is involved there will two sets of changes or twists. This polarisation problem is known as Faraday rotation.

Fixed horizontal polarisation		**Geometric rotation** (station positions + moon position)				
		-90°	-45°	0°	+45°	+90°
Faraday rotation (ionosphere)	+90°	**E** hears **W** **W** hears **E**	**E** hears **W** **W** hears **E**		**E** hears **W** **W** hears **E**	**E** hears **W** **W** hears **E**
	+45°	**E** hears **W**		**E** hears **W**		**E** hears **W**
		W hears E	W hears E	W hears E	W hears E	W hears E
	0°		**E** hears **W** **W** hears **E**	**E** hears **W** **W** hears **E**	**E** hears **W** **W** hears **E**	
	-45°	**E** hears **W**	**E** hears **W**	**E** hears **W**	**E** hears **W**	**E** hears **W**
		W hears **E**		**W** hears **E**		**W** hears **E**
	-90°	**E** hears **W** **W** hears **E**	**E** hears **W** **W** hears **E**		**E** hears **W** **W** hears **E**	**E** hears **W** **W** hears **E**

The extreme path loss on EME

Frequency	Avg. path loss
50MHz	244dB
144MHz	252dB
432MHz	261dB
1.296GHz	271dB
2.32GHz	276dB
3.456GHz	279dB
5.76GHz	283dB
10GHz	288dB

Very low signal levels are involved as the path loss is very high indeed so all cables, connectors and antennas should be of the highest order. The average path loss at 144MHz is 244 dB (and at 10GHz, only 0.00000000000000000000000000156% of the transmitted signal will reach the receiver). Amateur antennas used these days are perhaps each of 19 elements and maybe stacked in groups of four, or eight, or more and preferably steerable. However, results can be obtained with quite simple setups. The factor most required ,perhaps above all else, is patience and lots of it.

Most contacts these days are made using CW although more and more use data and the development of JT65 by Nobel Prize winner Joe Taylor, K1JT offers sensitivity benefits of at least 10dB better than CW.

John went on to list the many stations he has worked and continues to do so. The advances made by the now thousands of moon bounce operators world-wide, active almost daily, with many DXCC entities being activated by expeditions. The internet plays a very helpful role with facilities for EME chat, spotting and skeds. Today's moonbounce activity is quite different from when Peter Blair began his experiments some 50 years ago; he is still active on moon bounce and is one of the world's leading pioneers.

Thanks to John for a most interesting talk. He deserved his CARS mug.

Peter Blair, G3LTF and his more recent 6m dish

Further detailed reading can be found in the February and March issues of RadCom by John Lemay, G4ZTR and John Regnault, G4SWX. These articles can be read on the RSGB web site.

See also http://www.moonbouncers.org/ ***Colin, G0TRM***

Hall Street - a radio factory reborn

The Marconi Exhibition at Hall Street, Chelmsford, ran for 3 months until the 29th of May, after which the premises is to be turned over to commercial developers. The exhibition commemorated the pioneering work of Marconi and the tight links to Chelmsford, the birthplace of radio.

As part of a series of ongoing talks and activities, youngsters had the chance to make their first basic AM receivers over the weekend of the 14th and 15th of May. On Saturday 14th of May, I visited the exhibition with Kathryn, my daughter, so that she could make her first radio.

Kathryn, aged 8, already has some soldering experience, having make an LED badge at the Southend Raspberry Jam. The AM radio kit was a more complex project, but a little help from dad to hold the board steady, she was able to complete the Rapid Electronics kit with ease. Under the watchful eyes of Chief Engineer Ed, G8FAX, and Chris, G0IPU, the unit was tested and was able to pull in a strong signal from BBC 5 Live first time around.

After completing the project, Kathryn said: “It was really fun making my first radio and it was quite easy. I enjoyed counting the turns of wire on the aerial. I will be listening to my new radio at bed-time tonight”.

Kathryn also had the chance to sit in a replica of the Titanic’s radio room, and had learned about the fate of the Titanic at school. Kathryn’s school’s science work has included some basic electronics information, and she has been taught about voltage, batteries and circuits. She had to do a presentation on a famous inventor earlier this year, and chose Marconi. On the journey to the Hall Street factory, I explained about Marconi’s connection to Chelmsford, as well as the work done at Bletchley Park that has led to today’s computers and, when passing the Chain Home Tower at Baddow, discussion turned to the importance of that invention too.

It was great to have the chance to explore Hall Street and to walk through such a historic place. I was interested to find an old BBC Glensound mixing desk on display and, as a former broadcast radio technician, it brought back a few happy memories.

Thanks to Ed, G8FAX, Chris, G0IPU and the other helpers, plus the New Street volunteers for putting on an excellent exhibition and for giving Kathryn the chance to complete her Intermediate practical project a few years ahead of schedule!

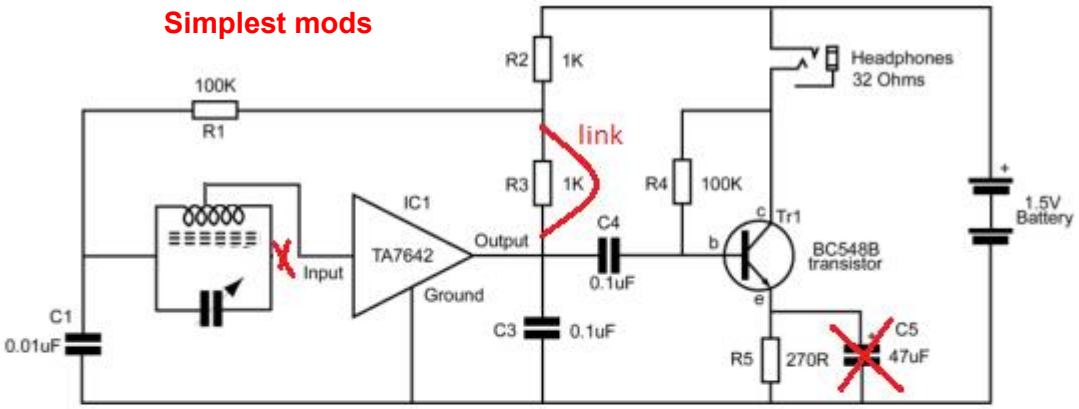
Pete, M0PSX

Radio mods

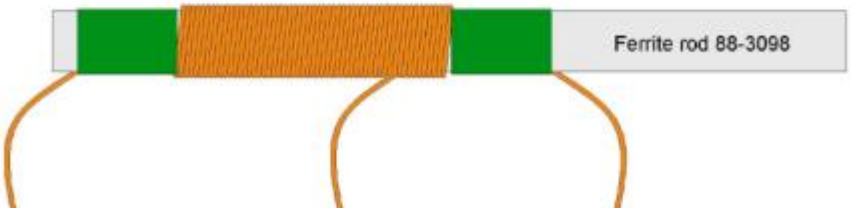
Did you build one of the simple AM radios? I found mine was unstable and had too much audio gain. There was inadequate RF decoupling due to layout and only a slight improvement could be had with additional filter components. Much better to just remove C5 , which reduces audio gain, and link out R3 (it should not be there in the first place) which improves AGC feedback and carrier breakthrough decoupling.

Next up, the coil doesn't have a very good Q and matters can be improved slightly by adding a link winding or tapping the coil, but that needs some slight board mods as shown below:

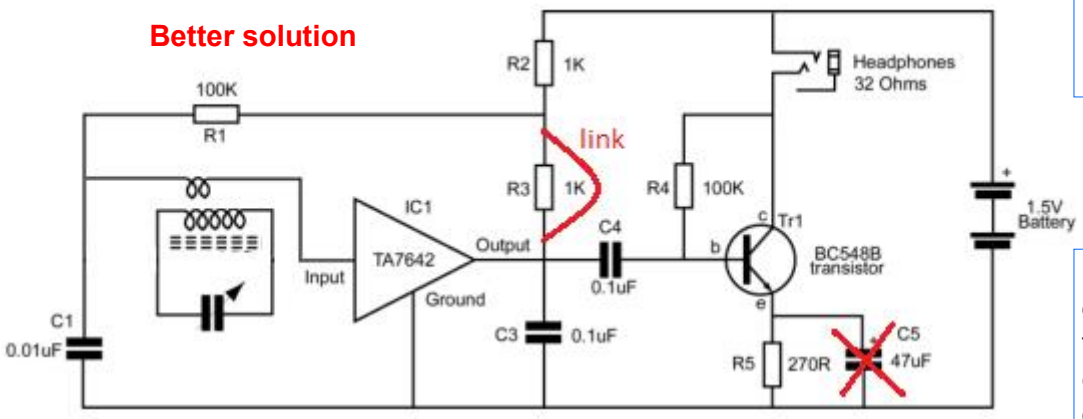
Simplest mods



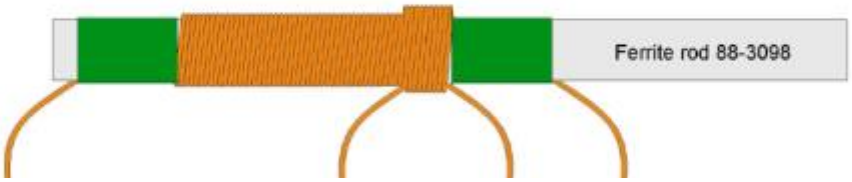
Tap the winding 10-15 turns from the earthy end. Isolate capacitor/coil junction from IC input and connect tap winding instead.



Better solution



Overwind the coil with 10-15 turns. Isolate coil/capacitor from board and connect overwinding in original coil position



If you have an old MW radio kicking about in a state of disrepair, the aerial coil is usually wound with Litz wire for a much better Q. If spare, it will give a very respectable performance indeed.

Also, if you are using headphones, try to make sure you use 32 ohms impedance and connect them in series—this raises the load impedance for improved audio out.

There are other things that can be done, but you can at least improve things by removing two components!

I had a 40mm piece of 10mm dia. ferrite that was used as the core of a choke inductor in an old TV. I had kept it for no good reason but found it to be superior to the suppled aerial rod.

I have no idea what material it was.

Ed.

Marconi exhibition - the end of the story?

There has been continuing interest in the Marconi Exhibition at Hall Street. Possibly because of the continuing publicity, but probably because people have been spreading the word, attendance rates have been steadily increasing. The last few weekends saw visitor numbers into the 90's each day.

It was nice to have been there on the last day of the expo and to see that original Marconi items, manufactured at Hall Street had been brought along form as far afield as Bognor Regis and Ely. These included a high tension coil for generating the spark and a tape inker with the all-too-precious coherer shining prominently. When I heard someone ask how big the spark gap was, I was quite staggered to hear the reply to the effect of "well, as big as you wanted, really—this is a 10" spark coil so it could have been up to that length".

Only then did it occur to me that this would have been staggeringly bright and dangerous, not to mention noisy, and an effective means of determining the power output of the transmitter as well. The analogy that ran through my mind was the difference in the energy emitted by a single spark plug compared to the arc generated by a welding set. It's obvious, really. Another notion was busted for me although the answer to that also should have been more obvious had I thought more about it. I was aware that the spark 'sang' at about 400Hz and often idly pondered the mechanism, as I was aware there was no modulation involved as such. It was when it was pointed out to me that the frequency of the contact breaker on the electric bell-like primary circuit interrupter could be 'tuned' +/- 50Hz or so by adjusting the contact arm, the penny again dropped.

The last question was answered when talking about the coherer. I was surprised to see how small it was in the flesh (metal?) and was listening to the operation being described when the misconception was corrected. I had always though of the operators as (probably) being lightning fast with the key although I wondered about the quality of the signal in whatever natural noise existed in those days with the rough tone of the spark - and having to avoid all sorts of sidebands from adjacent, untuned, transmissions.

Anyway –the grasshopper key would have been very difficult to use at speed and the natural top rate of the coherer refresh would have limited the maximum code speed to about 15wpm, so any notions of 40wpm rates went right out of the window. The grasshopper key was so named due to its shape and the position shown is where the key would have rested in Rx mode as it was the contact at the end of the long arm that made the receive aerial circuit and disabled the transmitter. After the magnetic detector was invented, things may have improved somewhat, but it all gave food for thought.

Talking of CW, I thought I had better include Andy, G0IBN and Colin, G0TRM, our two intrepid CW operators who both supplied CW equipment and kept the public happy with CW demonstrations and lessons during the exhibition - women and children first, I might add. Dads always seemed reluctant to show themselves inadequate in any way(!)

Visitor notes & permanent home?

I had a scan through the visitors book and people attended from far and wide –even Hong Kong– and one person cycled over from Colchester just for the expo. Almost all the comments were entirely complimentary but one of them echoed my thoughts and views: “Very interesting, but not detailed enough”.

Of course, with a permanent home, that detail could be provided. Even as the exhibition was progressing, people got to hear about it and came along offering exhibits both as loan items and gifts. Even on the last Sunday, a couple of folders with laminated contents were brought along; one containing a collection of Marconi stamps and the other, a carefully copied and transcribed set of the more important of the Marconi -gram originals that were sent during the course of history. With the scant resources available, the short timescales and a bit of a leap in the dark, no-one really knew how this was all going to pan out, but it seems to have generated a lot interest at County Hall and wheels may well be in motion to make this more permanent.

There is a (very) glossy brochure that has been produced by Chelmsford City and Essex County Councils to promote the use of the first floor of Shire Hall in Chelmsford as a Heritage Centre. Although the document originated some while ago and was dated January 2016, the success of the expo and the steady stream of dignitaries & BigWigs through its doors must, surely, amount to more than just the germ of an idea.

More on visitors: Chris was delighted to meet the daughter and granddaughter of Frederik Mockford, who joined Marconi in 1930 and is credited with anglicising M'aidez (French for help me) to the internationally recognised Mayday call. SOS had been designated the International Distress call in the 1923 Book of Wireless Telegraphy and Mayday joined it in 1924.

It was fun for me to get two young lads actually sending and receiving Morse code to each other on the practise keys whilst I was manning the stand. I was pleased to talk to G0FSE who had acquired her call to use whilst at sea on her husband's boat with which they sailed the oceans for some 12 years or so. Sadly, she did not keep the call.

I could go on, but many of this readership will have their own stories to add, no doubt.

At his closing speech, Chris Neale said that he was able to get financial help with the printing of the Hall Street books and, not only did they sell out, they have back-orders for more.

Steve Clow, who took videos of most of the proceedings throughout the 3 month period and put them on YouTube also pointed out that the large Marconi "M" from the cap badges was reproduced by his son from a ceiling beam that Steve found thrown in a skip outside. This had been hanging there and I never gave it a thought. How appropriate that piece of wood should have been turned into such an iconic emblem.

As a final note on this particular expo, Ted Sinclair, who made the replica radio room has agreed to allow it to be kept in Chelmsford for the foreseeable future. Let's hope it won't be too long before it sees light of day again! See http://youtu.be/gwhVO5Bkbcg for more information; there are so many back stories to it.

At my first visit to the exhibition, I bought two books: the Hall Street one and "101 things you thought you knew about the Titanic—but didn't." It is fascinating. Amongst a series of myth debunking paragraphs, Tim Maltin describes the use and origins of the now universally recognised SOS signal.

It is perhaps well known that the original call was CQD where CQ was the prefix to announce a call to all stations in general and D was used to signify distress. Tim suggests that there is evidence that the German Reichs-Marineamt introduced SOS as early as April 1904, but it was introduced officially in a set of three radio signals that became official on April1st, 1905. These were Ruhezeichen (cease sending signal) and comprised six dashes - - - - - - then Suchzeichen (quest signal) that was three dots, three dashes and a dot . . . - - - . So the next signal, Notzeichen, was just extended to . . . - - - . . . with no inter-character spaces. So as, for example, we send $\overline{\text{AR}}$ to signify +, should the well known symbol "SOS" really be written $\overline{\text{SOS}}$? Also, it seems Titanic was not the first to send "SOS"; that accolade going to SS Slavonia when she was wrecked off the Azores on 10th June 1909. Titanic actually sent both CQD and SOS. When Captain Smith asked what he was sending, operator Jack Philips replied that he was sending CQD and operator Harold Bride said "send SOS—it's the new call and it may be your last chance to send it".

As a last note, and heavily paraphrased for brevity, 2nd Officer Charles Lightoller, in charge of the lifeboats and when talking about "the utter inadequacy of the life saving equipment" at the enquiry, said that this was being admitted by the fact that the regulations governing British ships were now "Going Foreign" and "the margin of safety [had] now reached the ridiculous". Is this the first (misplaced?) high profile example of complaints about Health & Safety gone mad?

Ed.

Temple at War

My wife and I paid a visit to Cressing Temple to see a vast collection of war time vehicles, people and artefacts covering every possible branch, trade and rank from all services, both at home and from abroad. Every display fully active and manned by enthusiastic uniformed volunteers - hundreds of them.

The pictures show ground based early radio used by the Royal Flying Corps and the Royal Artillery for reconnaissance purposes. The second shows a training machine using printed paper tape to produce audible Morse signals and the third a key set for group sending practice; just my choice of pictures..... There of course other things to see for everyone. If anyone is thinking of going it will be repeated next year.

There is a web site: www.templeatwar.co.uk **Colin, G0TRM**

The Day of The Jackal

Talking of old radios, I have just been reading this novel for the first time, 45 years after it was first published. It's a curious mix of nostalgia for the 60's and fantasy, but very readable. I was drawn to a couple of technicalities I thought I would share on these pages.

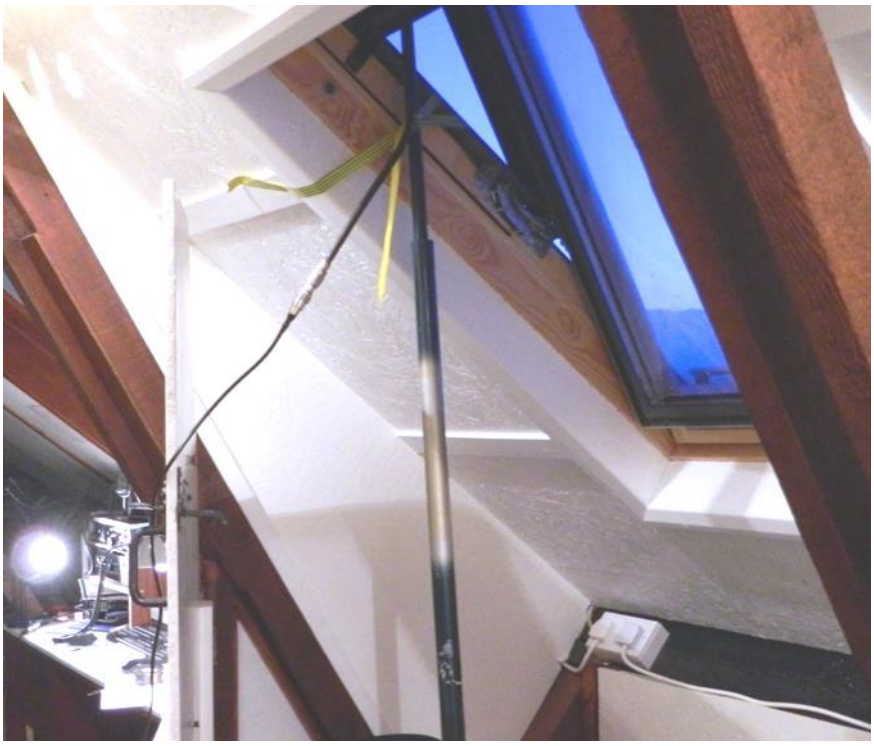
At one point, wishing to make scheduled person-to-person calls to heads of Homicide in the USA, Britain, Belgium, Holland, Italy, Germany and South Africa, the French protagonist's requirement was for the **UHF frequency** to be used and… "From the seemingly tangled porcupine of aerials on the roof of the building the high-frequency signals beamed out across the three continents, streaming high above the stratosphere to bounce off the ionic layer above and home back to earth thousands of miles away to another stick of aluminium jutting from a tiled rooftop. The wavelengths and frequencies were uninterceptable".

Good that it was reliable over those paths, then! ***Ed***.

2m Halo antenna

The May edition of RadCom featured on its front cover (*so does this - Ed*.) a 'halo' antenna made from copper pipe and dimensions were given for a 2 metre version. Well – as I had a few hours spare at the weekend recently & as I've got only a 2m / 70 cm collinear vertical antenna, I thought it would be interesting to try out some antenna construction. This design would be ideal for horizontal polarisation and thus 2m SSB. Excellent timing, as there is currently a drive to activate 2m SSB on Monday & Friday evenings.

A hunt through the 'lock-up' for some suitable copper tube was unsuccessful (I'm sure Arthur Daley would have been more lucky) but a chat with a fellow friendly ham resulted in a perfect find of 6mm copper pipe! 2 hours later, and with odds & ends including PVC waste pipe, mastic, a Rawlplug, a length of RG213 with a PL259 attached and lots of insulation tape, a prototype was made. I say prototype because it needs some work before permanently fixing on the rear aerial pole, but Heath Robinson & Fred Karno would be proud of what I've made! Anyway – it was certainly good enough to raise up on a fishing pole & launch through the Velux window in the roof shack.



First tests were not very good, but another helpful ham suggested I try out reception of the 2m beacons. During this exercise, swapping between the halo and collinear I found out that my patch lead was faulty; so - a quick re-solder and suddenly the beacons were audible. The halo was found to be working well and noticeably better than the collinear. Some good contacts were made on the Friday night 2m SSB activity including a portable station in Shropshire. Not bad for 5 watts from an old Icom IC-260E & an antenna that cost nothing!

The next job is to make some slight improvements to the halo construction and place this permanently outside on the aerial pole. All in all, a fun project and within the capability of someone like me with limited technical knowledge - and it opens up 2m SSB!

Jim Salmon, 2E0RMI

Essex University STEM Project 30-04-2016

I was asked by my elder brother Andy, G7TKK to assist in a project he was undertaking at Essex University involving the young (13-16 year olds) on a STEM (Science, Technology, Engineering and Maths) project day lasting two and a half hours in duration. I thought this would be a perfect place to promote Amateur Radio – so I did with a CARS banner and a small 2M radio Station.

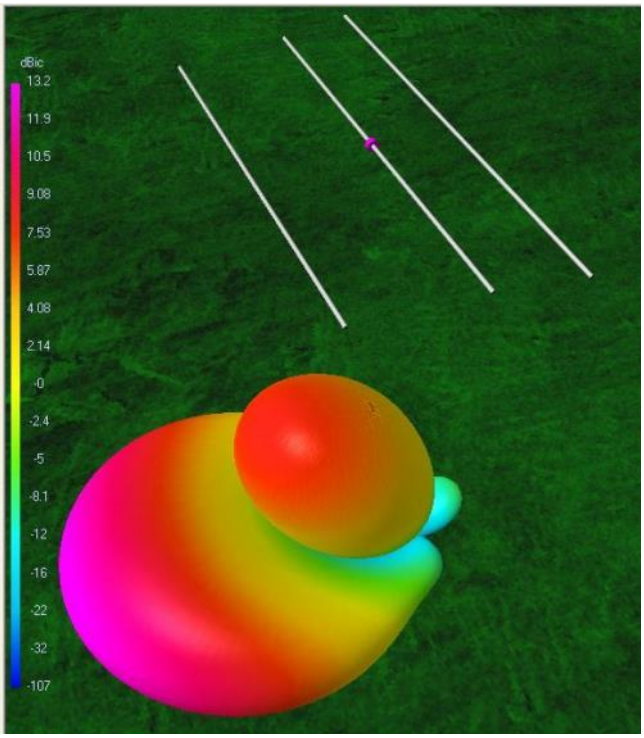
The team consisted of Dr John Woods, M0PUC (STEM Ambassador), Andy Chapman, G7TKK, Tony Holder of the University club call sign M0UOE and myself - Chris Chapman, G0IPU

The team activities were:

1) Make your own radio aerial
2) Locate and find radio transmitters (DF)
3) Listen in to the International Space Station

Individual activities were:

1) Predict satellite orbits (could also be team)
2) Use VHF Radio
3) Transmit a Morse message



Andy opened the event with a short PowerPoint presentation “Space and Radio - Extra Terrestrial Communications” outlining the event. Starting with upcoming events that were fixed points in time (we had to be there and ready, or we missed it), these were a flypast of the ISS at 10:20 for a 9 minute window, with another 90 minutes later for the same duration.

The construction of the 3 element Yagi was the most time consuming and had a priority as this needed to be completed before the ISS time slots. The aerials were made by sticking 5mm copper tape strips on to a cardboard substrate at a size of 1.0Mx 1.1 and attaching the feeder by croc-clips to the driven elements. A prediction program was used so that the elevation and angle were correct for the pass. When the ISS Beacon (on APRS - 145.825MHz) was received, the smiles on the youngsters faces was reward enough for me.

The other activities, Morse sending and receiving caused an incident when one young lad really got into it to the dismay of his girlfriend, who was heard to say ”really!”. The DF Stations were well hidden but easily found, however. They seemed most competitive in this activity, even to the point of injury (one knee badly grazed – a result of a fall while running to be first to the next DF box).

All in all a very rewarding event for all concerned and, would I do it again? Yes, especially if the WX was as it was; a superb morning. (The Yagis also doubled as a sun shade :0)

Christopher Chapman, G0IPU

After STEM, "Welcome to Smart"

That's what it says on the cover of the guide book I was left with after a British Gas tech installed new gas and electricity meters on 30th March. This replacement programme attempts to comply with the Government's requirements to have all homes fitted with such by 2020. I'm not averse to technology—often it is essential, but I do sometimes wonder what the energy companies get out of all this.

Before I retired, I was involved in a project that attempted to roll out smart metering to the *energy companies themselves*. The National Grid was put into place over the period 1933-1938 and much of the infrastructure dates back to that time. It was nationalised in 1947 and all seemed to be well until fragmentation of the system into the various energy companies that we see today.

Some of the substation transformers are now at their limit and, as heating effects increase with the square of the current, are at risk of failing with inevitable costly results. With the advent of solar domestic panels and the possibility that electric vehicles will become more prevalent in the (distant) future, electricity theft and various other problems, there was a perceived need for the individual companies to see exactly where the current was going, in which direction, what part of the structure was under strain, and by how much. Thus the need to monitor the various phases and report back remotely via the mobile phone network. I'm not sure now what stage that project is at, but it is one size bigger than the domestic system described below.

The domestic meters communicate via a ZigBee WAN hub and 'phone home every half-hour with meter readings. The gas meter has an electroluminescent display that is normally blank, but that can be activated if required. This is presumably because it has a battery that is designed to last for 10-15 years. There are no supply problems for the electricity meter or WAN hub, of course. Apparently, those customers with pre-paid gas meters using cards will shorten the battery life by 50% if they leave the cards in the meter!

The electricity meter has a plethora of readings that can be obtained and some of these are slaved to a remote monitor like the ones that are commonly found with clamp-on current probes. I guess the meter is designed to be used with a solar panel array (or many) because it has 8 registers for active power import, but one total active export. In all, you can cycle round the following: segment test, time, date, total active import, active import registers 1-8, total active export, total sum, total net, total reactive import, total reactive export, billing period duration, average voltage, average current, power factor, frequency, active power and reactive "power", two screens I don't recognise and version number. Phew!

The domestic display is much more mundane and is centred around frightening you into turning down the power by telling you how much it is costing you every hour, or day, etc. You can get direct meter readings from it at any time and additionally display your tariff, set your budget, read messages from the supplier, see a demo, set and receive alerts, alter various settings and access advanced data. Irritatingly, you can't get some of the more interesting readings displayed on the domestic repeater and you don't appear to be able to access anything useful from the website account. British Gas's Android app doesn't work either. Every time I log into it I find I can access all my account information, but when I want to look at the energy consumption, all I get is an error message.

Welcome to Smart, indeed.

The system is not just passive. I believe it is able to receive data from the supplier and modify its operating mode accordingly. Tariff rates are downloaded, as are software updates and remote commands can be sent to cut-off the supply until such time as a valid key reset is entered.

I trust it will be reliable in the long term. I say this, because when the tech installed the system, the first hub didn't work, as it thought it was still in the warehouse and wouldn't pair. Neither would the second one for different, unexplained reasons. The third was activated after yet another 'phone call to base and all was then well. Up until now, at least.

What difference does this make to my life? Not a lot. Yet. I already have a handle on what I use and how to minimise consumption, so it's not much of a bonus although indications are, contrary to expectations, that they are reading lower consumption than the old meters.

I do suspect, though, that once these things are rolled out more widely and the various companies get a handle on the amount and times of energy usage, it will help them build a massive data base that will enable them to offer, or possibly enforce, the use of certain appliances at off-peak times,

Time will tell. ***Ed***.

If you can be @rsed, there is a full information in the SMIP & SMETS document—a 126 page spec for the Smart Meter Implementation Programme, Smart Metering Equipment Technical Specifications here: *SMIP_E2E_SMETS2.pdf*

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50 shacks of grey

She stood there, in her beautiful dress and tallest heels, trembling with apprehension as I approached, holding the cable. "Are sure you can take the pain", I asked. "I - I think so", she answered.

So I showed here the receipt for the new rig.

CARS Training I

Colin, G0TRM turned this up and, quite rightly, suggested that inclusion in the Newsletter would show the longevity of the commitment the club has made to training over the years. Thanks, Colin. - ***Ed***.

CHELMSFORD AMATEUR RADIO CLUB

29th December, 1960

Dear Member,

I am pleased to inform you that analysis of the questionnaire recently circulated has shown that there is sufficient support to justify conducting both R.A.E. and Morse classes.

Classes will be held weekly on Thursday evenings at 6.30 p.m., the R.A.E. lecture occupying the period 6.30 p.m. to approximately 8.30 p.m., followed by 30 minutes Morse practice.

At present, the only available accomodation for these classes is the Lecture Room, Building 720, Marconi Works, New Street, kindly made available to us by the Marconi Company. Because of security restrictions, only Marconi employees can be permitted to enter the New Street Works; however, since applications to date are all from Marconi employees, none will be disappointed.

The first class will be held on 5th January, 1961, and will be devoted entirely to the first R.A.E. lecture, the first Morse class commencing the following week, viz on the 12th January, 1961.

The importance of starting R.A.E. at the first lesson cannot be overstressed. Additionally, it is essential that those proposing to take the CW course, should memorise the Morse Code (alphabet only at this stage), since this is best accomplished by self-tuition. A recommended method of memorising the Code is given on Page 4 of "Learning Morse" by Margaret Mills (G3ACC), obtainable from R.S.G.B. Headquarters at a price of one shilling, plus postage.

For R.A.E. notes, members will be required to provide their own notebooks (100 leaf, quarto size, is recommended), plus a scrap book for Morse exercises.

It is hoped in the near future to extend R.A.E. facilities to all members, and to introduce supplementary Morse practice classes.

It only remains for me to wish you the Best of Luck!

A.J. Davies

for (R.D. MAY)
Publicity Representative

CARS Training II

Toward the end of the last Foundation exam, one of the invigilators noticed a candidate studying his paper, tossing a coin and occasionally muttering under his breath. Slightly concerned, the invigilator went over and quietly asked the candidate what he was doing. “Oh, I finished the paper half an hour ago, so I’m just checking my answers”.

THE 2MT PROJECT

February 2022 will see the 100th anniversary of the birth of regular radio broadcasting in the UK , and effectively the start of the BBC.

The first broadcasts were made from the hut in which you now stand, although the hut was then located at Writtle.

Although the original transmitter was dismantled after transmissions ceased, a group of volunteers are currently in the process of constructing a replica

VALUE OUR HERITAGE

The Marconi engineers who designed, constructed and operated some of the world's first radio transmitters were pioneers in their field and really put Chelmsford on the map. Many of the valves were initially made in Chelmsford, and were the first of their kind.

Many of the people living in Chelmsford and its surroundings will have relatives who worked at the Marconi Company and its associate company EEV, they can be justly proud of the achievements of their relatives.

Chelmsford was at the focus of the start of the electronic age, and the Marconi Company had a world-wide reputation.

Peter Watkins, M0HBY by his replica 2MT transmitter.

Chris, G0IPU made the grey box on the right - it is a 250W version of 2MT.

John, G8DET

2 Emma Toc again

I Googled my callsign a while ago whilst looking for an image of me that I had seen on the 'net. I didn't find the picture, but I came across a reference to me in Practical Wireless October 1983 that was reproduced on the americanradiohistory.com website. I was puzzled, as I didn't think I had ever featured in that publication, but then I found it was contact details for the RAE classes I used to run in Crawley. Anyway, in the next column was an item with the above title, that is reproduced (right). In those days, I wouldn't have had the slightest interest in the Marconi Society but since I have lived in Chelmsford, it has naturally come to my notice.

'S funny how things turn out. ***Ed***.

Skills Night

No, I haven't forgotten this, but I have rather run out of space. I was, though, quite taken with this picture: "Now, tell me. What seems to be the trouble?"

LP restoration

This issue has been themed with old technology; accordingly, Colin, G0TRM sent me this:

Are you still playing your LPs? Are they a bit noisy; have you tried the latest cleaning technique? I haven't tried it but I am told it works. It's simple; all one does is to cover the whole disc with a layer of PVA glue, leave it to dry thoroughly (a day or so) then peel it off, taking all the dust etc. with it.

Colin, G0TRM

After a break of sixty years the callsign used by Marconi's original Wireless Telegraph Company to introduce Britain's first public entertainment broadcasts was re-launched on Saturday 2 July 1983 by the newly formed Marconi Radio Society.

Practical Wireless was honoured to be among the many guests invited to Marconi Space & Defence Systems' Stanmore headquarters to witness the famous callsign, now prefixed with 'G' to accord with current UK practice, being transmitted to amateur stations around the world.

The event was made all the more interesting as the station used British-made KW Electronics equipment.

One of the special guests was Eric Godsmark, Regional Secretary of the International Amateur Radio Union, who is seen in the picture presenting a pennant to George Benbow G3HB,

Chairman of the Marconi Radio Society (left).

Marconi's Wireless Telegraph Company Ltd. was first granted an experimental licence in the summer of 1920 to use 2ET to introduce news bulletins. The licence was rapidly revoked by the authorities after a concert had been broadcast featuring a Danish tenor. The Wireless Society of London, now the RSGB, persuaded the Postmaster General to allow the station to use the callsign for entertainment purposes and the first scheduled entertainment broadcast in the UK was transmitted on 428·6kHz from Writtle, near Chelmsford, on 14 February 1922, under the callsign "Two Emma Toc". Transmissions, which were restricted to thirty minutes every Tuesday evening, ceased in January 1923.