RAG CHEW

GLOUCESTER AMATEUR RADIO AND ELECTONICS SOCIETY
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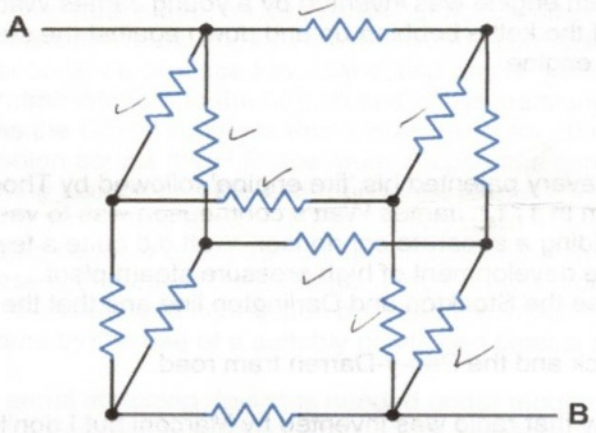
Resistance Cube Problem
(Ian's entry in the club Construction Competition 17th March 2014)
Ian G4CLR

The challenge is to calculate what the equivalent resistance is between the two opposing corners **A** and **B**. The 12 edges of the cube each contain a 1 Ω resistor, A daunting problem, a thought provoking piece that brings Kirchhoff's Laws to the fore. There are lots of opportunities for making mistakes.
(Ian will be providing the answer)

All resistors are 1 Ω



This is the cube structure of 12 x 1 Ω resistors electrically connected between the 8 vertices.

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2 Metre Contest May 1970 (continued from previous Ragchew)
Brian G4CIB

We left off at my last article having survived sub-zero temperatures in Arthur, G8BRN's Dormobile. Our appetites were well and truly whetted, and our thoughts turned to the next big 2 metre contest held over the first weekend in May. We decided that as we would be well and truly into Spring, the Dormobile would be again suffice for our needs, also the site at Cutsdean had been suitable so plans were set in motion.
Arthur very generously said I could use my call sign, G8CIB. As my very modest 2 metre signal had rarely penetrated outside Gloucestershire since being licenced the previous year, this would be a tremendous opportunity to get some "exotic" call signs in the log book.
The station was very much as before, other than Arthur had modified the valve transmitter to provide a more efficient (and therefore less battery consumption) modulation system - series gate (or low level) amplitude modulation. My log book (which I still have) notes that we ran 15 watts DC input.
So at the "off" - 1800, we worked our first station - G8DGR, 10k SE Newbury. If you recall in my last article, our transmitters were crystal controlled (fixed frequency) and you called CQ then searched the band tuning either "low to high" or "high to low".
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If you were searching for stations it was handy to have a box of crystals as very often if a station was being worked on say 144.350 Mc/s (yes it was megacycles in those days), the other station would

announce that they would continue to tune up the band from that frequency, so if you had a crystal covering, say 144.360 Mc/s, you could plug that into the convenient front panel crystal socket, call the station and have a reasonable chance of working him. It would be a few years before transmitters came on the scene with stable VFOs enabling QSOs to take place on the same frequency.
My log book tells me that in the first hour we worked 9 stations, located near Newbury, Wantage, Monmouth, Aylesbury, Salisbury, Newbury (again), Bridgnorth, Wrexham and Ludlow. This was magic!!
By midnight we had worked the grand sum of 31 stations, including F1AAD/A, located near Cherbourg.
After midnight the QSOs steadily ticked over and by breakfast time we had amassed a total of 68 contacts including 5 more French stations, a German station, DL8GA/P and a wonderful QSO with GC2FZC, Walter, in the Channel Islands. Mid morning and we clinched PA0CML (only SK a few years ago). Things tailed off a bit after lunch and by close of play we had 101 QSOs in the log book.
These are modest numbers by today's standards, but this was with low power, inefficient AM. On reflection we had had a great deal of fun!

(to be continued)

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Just Who Did What?
or Steam Radio
Mike G6OTP

I have just read the excellent article by Brian M6BRI on Guglielmo Marconi in the recent edition of Ragchew and it set me thinking.
As everyone knows, the steam engine was invented by a young James Watt who went to tea at his grandma's and saw the lid of the kettle bobbing up and down against the steam pressure. "Aha", he thought, I'll invent the steam engine.

Oh no he didn't!

As early as 1698, Thomas Savery patented his 'fire engine' followed by Thomas Newcomen with his first use of a piston and beam in 1712. James Watt's contribution was to vastly improve the efficiency of the Newcomen engine by adding a separate condenser. Watt did quite a few other things as well but also deliberately impeded the development of high pressure steam plant.
The first railway was of course the Stockton and Darlington line and that the first engine was Rocket - or were they?
Don't forget Richard Trevithick and the Pen-y-Darren tram road.

I think most people would say that radio was invented by Marconi but I don't think so.
Just what were the contributions and interactions of such people as James Clarke Maxwell, Heinrich Hertz and others? Then there was the experimental work by such as Sir Oliver Lodge, Captain Sir Henry Jackson and Guglielmo Marconi himself. I had no idea that the later had been awarded a Nobel Prize, (they didn't just hand those out in those days) and thought that he was just an entrepreneur who had put together a patented system.

A couple more way points with gaps between to be filled:
The CQD distress call from RMS Titanic was first heard by an amateur listener at Gelligroes Mill, Pontllanfraith in South Wales who of course was not believed and lastly the first trans-Atlantic QSO was very much later, some time in the early '20s.

Can anyone make the connections and fill in the gaps? [This could be your chance to write an article]

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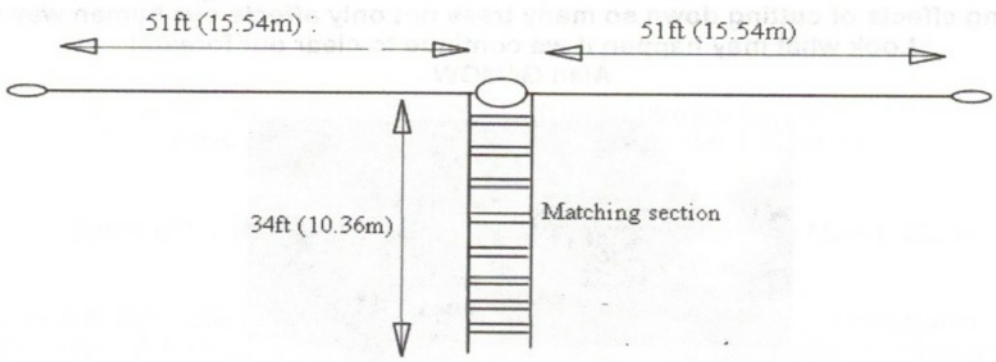
THE OTHER G5RV
Tom G3XMM

The G5RV must be one of the most-used aerials on the planet but knowing of it does not necessarily mean understanding how it works. The RSGB Bulletin for July 1958 contained an article entitled "An Effective Multi-band Aerial of Simple Construction" by Louis Varney, the eponymous G5RV. At the end of World War 2 he was awaiting both demobilisation and the restoration of amateur transmitting licences. In anticipation of the latter he designed a multi-band aerial which would work effectively in a

garden of "average size". Two versions of this aerial were produced and worked well for him and for several of his friends. The basic form of this aerial is shown below. The matching section can be Open - wire or commercially available ladder feeder.



THE BASIC G5RV MULTIBAND ANTENNA

On the 20 metre band the basic aerial is a horizontal three half-wave element fed in the centre via a half-wave matching section. This means that, on 20 metres but not on other amateur bands, the bottom end of the matching section looks like a low impedance to anything connected to it. Louis suggested that a "hang up and go" aerial could be produced by connecting any length of 72 ohm twin feeder (coaxial cable in its modern manifestation) to the bottom end of the matching section. Analysis of this variation that we now know as the G5RV suggests that it is an aerial for 20 metres that can be persuaded to work after a fashion across the H.F. spectrum in spite of a considerable impedance mismatch between the matching section and the low impedance feeder connected to it on most amateur bands. A certain amount of matching for reactive loads up to a few hundred ohms could be obtained by adjusting the output controls of the transmitters in use at the time the article was written, but this is certainly not the case with modern transmitters. Another objection to the modern G5RV is the problem of the balanced to unbalanced connection between the matching section and the coaxial feeder but this can be overcome by the use of a suitably positioned coaxial choke.

Accepting that some form of aerial matching device is needed under modern conditions, the other version of the G5RV looks an attractive proposition. The coaxial feeder is dispensed with and the open-wire feeder extended back to the shack where any necessary matching can be carried out. In practice the lengths of the radiator and feeder for a doublet of this type are non-critical and can be made-up to fit the space available if a few precautions are observed, but to be a "G5RV" the horizontal radiator should be approximately 102 feet long. The use of coaxial cable is restricted to the connection between the transmitter and the matching unit with a consequent reduction in losses compared to the compromise design.

One aspect of the original article which did interest me was the implied assumption that the amateurs of the immediate post-war period would be familiar with the general type of construction being suggested. Indeed, in conversation, Louis said that he had never thought of claiming any great originality for the aerials because as far as he was concerned there was nothing very new about them. Searching through my 1936 edition of "The Radio Antenna Handbook" confirms this point of view. Aerials similar to both types of G5RV are mentioned. In particular aerials with 103 foot tops feature are in both the "Collins Multiband" and "Johnson Q" systems.

I have to admit a personal interest in "the other G5RV", for an aerial of this type was put up at G3XMM as a temporary measure in 1987. It worked so well that it is still in use today. It enables me to compete quite effectively in DX pile-ups, operating as a shortened doublet on 160 and 80, two half-waves in phase on 40 and 30, and as an harmonic aerial on the higher HF bands. Even on top-band, where it is extremely short and low, I am able to work stations on the East Coast of the USA and Canada when conditions are reasonable.
All of this with 80 watts or so of CW, plus SSB and data when necessary, and a maximum height of about 20 feet above ground speaks volumes for the worth of the design. This would be enough to ask

of an aerial I suppose but I have also used it on 6 metres and, just for fun, on 2 metres. I dare say it would go on 4 metres but I have not tried it on that band. It does need to be well matched of course and I can offer some advice about that if necessary. Bending it into the space available does not seem to affect it too much and it is low-noise and reasonably neighbour-friendly. So if you need a new aerial why not give it a try.

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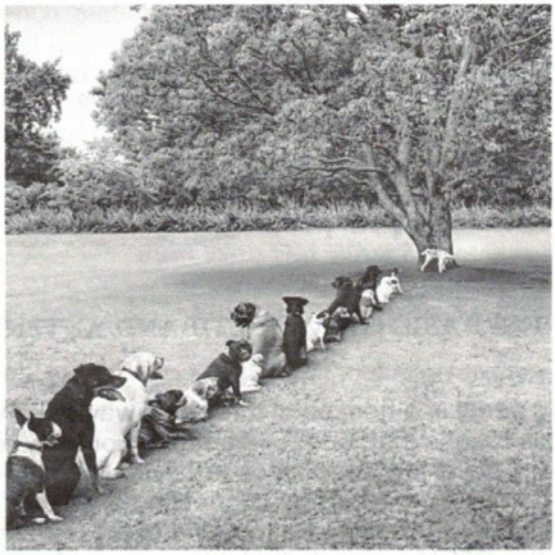
Devastating effects of cutting down so many trees not only affects our human way of life. Look what may happen if we continue to clear our forests!
Alan G4MGW



Thank you to those who have contributed to your issue of Ragchew
If you have an article to share; projects, old stories, jokes or cartoons, trips, interesting non radio interests - email it to me or give it to me on paper
brian.millard@virgin.net

YOURS

Project
old story
jokes and cartoons
interesting non radio interests

COULD BE HERE
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