

TDARS

Newsletter

Issue 233

Jan. 2009

www.TDARS.org

Programme

www.telfordhamfest.co.uk

- January 14** 80m SSB Transceiver Kit, presented by Steve Drury G6ALU—as seen at Leicester Rally 2008. A very attractive kit, available on-the-night or order (about £45.)
- January 21** Club Projects. Antenna analyser and/or RF field strength meter.
- January 28** D-Star Update by Don M0FHM. & Richard M1RKH. GB7SY etc. etc.
- February 4** Informal meeting , Committee Meeting. The Huntsman Inn lounge area
- February 11** Video Evening. Another selection of short videos selected by M0TAW
- February 18** Under-a-Fiver Construction Competition. (excluding box, PSU etc.)
- February 25** Society Projects. Probably many will be complete by now. Bring along!
- March 4** Open House / On the Air / Committee Meeting 'upstairs' HQ.
- March 10 (Tues.)** First 2009 HamFest Committee Meeting @ The Huntsman. 7:30pm.
- March 11** Main Construction Competition. Try and bring something along...
- March 18** 'Marconi' activity 2009 M/C Martyn G3UKV. (Note: IMD Sat. April 25)
- March 25** Annual General Meeting (with free refreshments!). Usual Agenda.
- April 1** Open House / Committee @ the Huntsman.
- April 8** 'The Journey' by Guest Speaker and Writer Ted Cowling.
- April 15** Hints & Tips—Members' suggestions on any subject (within reason!)
- April 22** 2 metre DFing (direction finding). Have a go this time round ?

**For Amateur Radio Exam Training—enquiries to Mike G3JKX (01952 299677)
For Morse Training and Morse Proficiency Tests Martyn G3UKV or Eric M0KZB.
For Equipment Loans & Returns Kevin G8UPF or Richard G0VXG**

G3ZME Telford & District Amateur Radio Society. *Founded 1969* **G6ZME**
Village Hall, Malthouse Bank, Little Wenlock, Telford. Shropshire. TF6 5BG

QJC? News & Information

From time to time, Members enquire “What is the reflector?”, or “How do I join the TDARS reflector?”. Briefly it is an Internet contact resource, run by the ‘Yahoo’ provider, where members receive and send open e-mails to and from other members and can add their own comments, which are seen by all who are signed up to the Reflector. The content can be anything, but usually relates to Members’ common interests and TDARS matters in general. The comments about Mike G4AUZ (see the Editorial) are an example of what is sometimes sent via the Reflector. There are other facilities (eg a calendar, files database area and more), but we haven’t used these further features to date. If you already have signed up to ANY Yahoo Group, you just need to ‘Join this group’ on <http://uk.groups.yahoo.com/group/TDARS/> (you will need to use your Yahoo! ID & password) , but if not, you first have to register with Yahoo! via <http://uk.groups.yahoo.com/> where there is a “New to groups? - Sign up” in the title box of the webpage. It’s a ‘moderated’ group, so that new members signing-in have to be confirmed by our moderator, Dave G4EIX, before they can fully access the group. It’s all quite painless, and doesn’t lead to loads of spam or junk mail, but lets Members keep in touch with each other, ask questions, and know what’s going on, including last-minute programme changes and sudden news, as in the example above. Currently, about half the TDARS membership subscribe (at no cost) to this useful facility.



Thirty seven members and partners/family attended the **excellent meal** at The Duck (formerly Allscott) Inn before Christmas—a record. If someone forgot to ‘settle up’ at the bar after the meal, please let me know, or contact the Inn directly, as there appeared to be a discrepancy at the end of the evening. No one stayed for the indoor bowls after the meal, possibly due to longish distances many members had to travel to get home.

Since the installation of the **new access steps** to our upstairs storage area at TDARS HQ, there is a noticeable squash to get through the loft area opening. We have requested and got permission to extend the opening somewhat, and this is planned to take place in the next few weeks, along with the re-wiring of the upstairs facilities.

Several of the new **Club projects** have been built over the Christmas/ New Year period. Please consider entering your project (or any other) in the Club Construction Competition (March 11), not forgetting the earlier ‘Under-a-Fiver’ competition (Feb. 18). In recent years, there has been a drop-off of entries, so don’t be bashful—bring it (them) along !

Another special Club date is Wed. April 8th, when **Ted Cowling**, and his business friend Ken Ballantyne are guest speakers. Ted is the local author of the book “The Journey” which is an account of his distinguished time in the RAF during the last World War, and thereafter. He will be inviting donations afterwards for the Telford Severn Hospice at Apley Park. TDARS will certainly make a donation on your behalf—but feel free !

The third (or is that 32nd. ?) **Telford HamFest is set for Sun. 13th September**. If at all possible please keep that date free to assist in this venture. We are applying to ‘borrow’ the RSGB GB4FUN trailer. Note also the weekend of June 20/21 which is the **‘Relay for Life’** at the Northwood Stadium, Stoke-on-Trent. More details to follow.

The **Enginuity Project** (to provide a presentation of electronic type activities for the public) is still on-going, but seems to progress at minus 50 mph. Not entirely our fault !

The POW Problem—by Tony M0TAW
(A solution to getting the Message!)

I know that the problem posed by the Escape Committee evaded solution by some at the Skill's Night (Nov. 26th) although there was at least one workable solution submitted.

Stripping away the narrative, the problem was to make a tuned circuit in order to receive a broadcast station transmitting on 7.850 MHz. The components available were three inductors (coils) each of 6.8μH; 3.0μH and 1.0μH in value and four capacitors of 150pF; 75pF; 25pF and 5pF.

In selecting a coil, none of the inductors were large in value but in order to keep interacting inductances to a minimum I would refrain from using two or more together. (Remember this is a lash-up built under POW conditions!) By the way, remember that for inductors connected in parallel you add the values while for inductors in series the formula is the same as for resistors in parallel!

So, lets try using the largest – the 6.8μH. We know the desired frequency so using those two known values and the formula, so helpfully provided:

$$LC = 25330.3/f^2 \text{ where } L \text{ is in } \mu\text{H}, C \text{ is in pF and } f \text{ is in MHz}$$

This gives us $6.8 \times C = 25330.3/ 61.6225$ and moving this around gives a value of C as **60.45pF**.

Now, we don't have a 60pF capacitor in the bag but can we make one from what we do have, remembering the rules for capacitors connected in series and parallel? (Yes, it's the opposite to resistors):

$$\text{Parallel: } C = C1 + C2 + C3 \text{ etc, and in Series: } 1/C = 1/C^1 + 1/C^2 + 1/C^3 \text{ etc}$$

We have a 150pF capacitor so how could we combine it with any of the others to produce 60pF? Obviously the net effect needs to be lower in value and therefore we are looking for another capacitor connected to it in series. (Remember that the net effect will be lower in value than the value of the lowest value component – just like resistors in parallel)!

So, try it and we get:

$$1/60 = 1/150 + 1/C \text{ and moving this around gives } 1/C = 150-60 / 60 \times 150$$

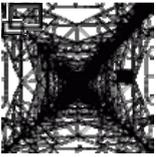
which works out at 100pF. Oh dear, we don't have a 100pF capacitor. But wait a minute; we can make 100pF easily by just connecting the 75pF and the 25pF components in parallel!

So there we have it: 60pF is made from the 150pF in series with the 25pF and 75pF which are connected in parallel.

Just to check if we now substitute our component values back into the top equation we get:

$$6.8 \times 60 = 25330.3/f^2, \text{ then } f^2 = 62.084 \text{ or } f = 7.88\text{MHz}$$

This is a little higher than the broadcast frequency but stray capacitance and inductance in the circuit should take care of that and anyway it's not a narrow band transmitter but the BBC! If not a couple of turns of wire around the inductor or a 'gimmick' capacitor made by connecting two short lengths (c.1 inch) of insulated wire to the top and bottom of the capacitors connected in parallel and twisting them together will give a small rudimentary preset control. >>>>>



CRIGGION RADIO STATION - A HISTORY: Part 2

By S.F. Brown. MBE. C.Eng. MIEE. G4LU © Copyright 2005.
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Hair Raising Experiences (contin.)

Each final amplifier had its own mercury vapour rectifier, utilising six GU8 valves, in a three-phase full wave circuit, but the commutation of their output currents, of about 20-30 amps each, reflected back on the mains and telegraphists in the railway station at Oswestry, some fifteen miles distant, could read our traffic from the mains hum. This problem was solved by upgrading the power line from the sub-station on the Oswestry- Newtown System from 11kV to 33kV with our own transformer to feed the station's 11 kV ring-main. In the later re-build of 1967/69 the two power panels each with their 18 valves were replaced by three amplifiers each with a single vapour cooled triode valve; the aerial was made more extensive, by being supported on three additional guyed 700ft masts, thereby reducing the size of the aerial tuning inductance which was achieved by paralleling the "spiders".

The driver stages in the new transmitter comprised a 5kW valve amplifier originally, for each main amplifier which were subsequently replaced by solid-state amplifiers. The rebuild was a copy of the Rugby, GBR, transmitter which had been refurbished earlier in the '60s. Frequency stability, on which several of the sophisticated modes of transmission depend, was provided by a basic Rubidium (or Caesium) oscillator controlling a frequency synthesiser. These improvements enabled the aerial current to be increased from about 400 amps. to about 700 amps.

Of the LF sets, only one was a standard commercial product and that was a Marconi 40kW transmitter with several unusual features. It used a pair of normal air cooled glass/metal neutralised triode valves connected in parallel for the output stage, which was driven by 4 - 813 valves in parallel. Its final tank circuit comprised a pair of paralleled, oppositely wound, units, assembled close together, to reduce the local field and the link coupling coil was provided with a specific value of capacitor in parallel to make it into a low-pass filter for reducing harmonics. The ATI was a similar astatic pair of coils.

The other LF transmitter was a Naval type 22C which was installed by naval personnel. It used silica valves in the power stages and, because similar hard diode valve HT rectifiers were used, which had bad regulation; additional silica envelope triode valves were used as an absorber load on the HT line, conducting alternately with the power valves, in order to preserve the keyed wave-shape. Improved regulation of the HT line was achieved by installing a three-phase full wave mercury vapour rectifier, which enabled the absorber valves to be dispensed with.

Surprisingly, many years after the war, we were dunned by Admiralty accountants for naval stores that were provided during its installation. These papers were imaginatively put back into the bureaucratic chain, usually by re-directing to a telephone manager somewhere, miles away, to be lost for ever!

The replacements for these transmitters, in the late 1970s, early 1980s. were of a more recent commercial design but that description is relative. They were second hand transmitters which became available when the Navy closed down its New Waltham station but, first, they were refurbished by PO staff.

Originally all the PO HF transmitters were designed to provide modulated carrier DSB (double sideband) signals, the audio signal modulating the suppresser grid of one of the early pentode amplifiers. This situation persisted until shortly after the end of the war. The surge in post-war traffic, plus the need to provide many circuits for the Cape-Town Olympic Games, spurred on the conversion of all but two of the HF sets to ISB (independent sideband) working, with in some cases, two circuits on each sideband or audio circuits on one sideband and a multi-channel telegraphy system on the other. It should be mentioned, too, that the original SWB8 transmitter was replaced in 1943/4 by a ST&C CS5B transmitter and two CS3B units were provided in the other HF building. These ST&C transmitters all had their own integral water cooling systems.



Towards the end of the European War a Western Electric 2kW SSB transmitter was installed in each HF building for Army traffic. Later, the P.O. built additional purpose designed SSB transmitters (as distinct from the conversions of the earlier transmitters), two in each of the HF buildings. To cope with the ever increasing traffic two air-cooled 8kW transmitters, with motorised wave-change switching; were built by the P.O. plus two ST&C type DS12, 4kW transmitters, were installed in one of the HF buildings. Directions of transmission to distant destinations were limited to within the arc covered by the Breidden Hill and its near neighbours but the more distant hills were no impediment since they subtended lower angles to the site than the radiation from the beam aerials. Most of the HF aerials post-war were rhombic patterns.

The Criggion Christmas 'Run'

Mention of the war brings to mind that Criggion was in the midst of an agricultural area that did not seem to know that food rationing existed elsewhere in the country. Eggs and butter and the odd bit of bacon or chicken were not impossible to come by. One visiting engineer from London, of senior rank, invariably visited the station carrying an empty suitcase. On his return it was hard to lift into the train. On another occasion, one Christmas, a large enclosed van was returning to London when it was stopped in a queue of vehicles by police checking on Xmas-tree poachers. Shining his lamp on the side of the van, and seeing the Royal Cipher and the PO Title, he passed it on. Had it been opened it would have been found stocked to the roof with farm produce and to be sure heads would have rolled at high level in the Post-Office.

Around the world

Until the Atlantic cable came along, Criggion carried all fourteen circuits to the USA four channels on three transmitters with two broadcast quality circuits on the fourth. Also, due to political animosity with India a land-line connection was not possible between Pakistan and what became Bangladesh, so their traffic came into London from one and out again, via Criggion, to the other. It was on the Indian circuit that Lincompex was first tried, it being a system to control levels to overcome the variations in the radio path. Regrettably it came too late to avoid the demise of HF. Also shortly after the completion of the HF turnkey installation of 28 Marconi HS51 transmitters at Rugby, one was installed at Criggion and was used on the Maritime Telephony service.

But "Sic transit gloria" when cables and satellites came on the scene the HF systems closed down one by one. Later in the first year of the Atlantic cable, in the October if memory is correct, the link at the Canadian end broke down. We were away with all our transatlantic transmitters within the hour - it was about five hours later when the Americans came up. Such was the efficiency of their privatised system!

Pumping out the Valves

Each HF building had a 120kW demountable valve amplifier working on traffic but only one of the two intended 250kw amplifiers was ever completed. It provided several problems mainly due to the high input capacitance and low input resistance of the valves and the need to match that impedance to the driver stage slightly remote from it. The difficulties were overcome but the completion of the first amplifier coincided with a policy decision to scrap all demountable valves. The reasons were two-fold; slow delivery from the manufacturers of replaceable parts and damage to the optically flat seals at the break-joint because staff hadn't been adequately trained. This meant frequent difficulties in getting the valves down to vacuum resulting in the pumping equipment running continuously. Under good conditions it was possible to replace a filament and/or grid electrode within an eight-hour shift. If problems were encountered with the sealing it could take days!

The original stand-by generator comprised a 1500HP English Electric, Fullagar, opposed piston, diesel engine driving a 1000kW alternator. The diesel engine had six cylinders arranged in three pairs with the upper piston in each cylinder cross connected to the lower piston in its partner of the pair of cylinders. The upper cross- heads, to which the bars joining the opposing pistons were connected, worked in boxes above the cylinders forming scavenge pumps to clear the cylinders of exhaust gases after each stroke.



The bottom crossheads were connected to the con-rods driving the crankshaft. The alternator supplied the whole of the station and it could be synchronised with the mains to avoid a second shut-down on restoration of the public supply. Such was its size that lubricating oil had to be circulated to "float" the crankshaft before start up. Also, compressed air starting was provided on only two cylinders so that at shut down the engine had to be barred around by means of a large crowbar and teeth on the fly-wheel to the starting position. These two features meant that there was a delay of anything from five to ten minutes before the emergency power could be connected to the station ring-main at 11kV. This did not meet the requirements when the VLF station was rebuilt in 1968 and consequently a beautiful machine with only about a 1000hrs running life was cut up for scrap.

Striking Oil !

Two events remain in memory about this engine. After the initial run up the lubricating oil circulation was adjusted on a by-pass valve which was operated by a hand-wheel on a screw thread. What I didn't know was that the thread didn't have a stop on it and one day it came off in my hand. I had seen pictures of oil-gushers in the cinema but this was its equal - a stream of warm lubricating oil hit the ceiling and descended onto my head soaking my clothes to the skin.

Another occasion when we were returning the supply to the mains the remote switch, operated over a land-line link and which connected the alternator to the ring main bus-bars in the distant sub-station about a quarter of a mile away, would not open. The only recourse was for someone to visit the distant building and to ensure by telephone that the alternator was off-load and then lower the high-voltage switch from the bus-bars. Fortunately, this worked with only a little sparking as the switch came away.

The Omega Navigation System

One thing of interest is that there was a lull in VLF traffic towards the end of the '50s and GBZ was shut down. The opportunity was taken by the American Naval Electronics Laboratory from San Diego to use the aerial for the initial tests of the Omega Navigation System. They arrived one Saturday evening, unannounced, with a large trailer which had great difficulty getting on to the site. The trailer housed a 250kW air-cooled transmitter and additional aerial loading coils were set up in a plastic dome to tune the system to 10.2kHz. The RF connection from the dome into the building, to connect with the normal ATI was taken through a polystyrene panel replacing the top light of a doorway. It quickly flashed over and burnt up but a replacement lead through insulator was made from a couple of plastic buckets from Woolworth's, giving a longer leakage path, and that lasted throughout the tests.

The Omega system depended on the Criggion and Haiku (Honolulu) transmitters being slaved on the Boulder (USA) transmitter and to that end a remote receiver was set up in Brogyntyn Hall, some 12 miles distant, (the seat of Lord Harlech), but then occupied by the Lines Branch of the PO.

The transmissions comprised emissions of carrier frequency in individual short sequential time slots which enabled the receiver to pick up the master signal without local interference but obviously the whole link comprising the landline and the radio path from the master station had to be corrected for time delay. In addition the siting of the station had to be determined with some accuracy and this was done by the Naval Hydrographers Department. A later improvement to the system incorporated the sequential use of a second frequency of 13.6kHz (four thirds of 10.2 kHz) interleaved with the original frequency to reduce the anomalies in positional determination.

The Omega System depended on the remote vehicle comparing the time delays in the signals from the master and slave stations to determine its position. Because of subsequent requirements the European station was built elsewhere and Criggion started again to take its own traffic.

Sixty-one Happy Years

As we said at the beginning, the HF services at Criggion finished in about 1971/2 and all the transmitters were scrapped. The VLF and LF services continued until March 2003. Then 61 years of a very happy station was consigned to oblivion. Criggion always was a happy station. Nurtured in wartime a camaraderie grew up amongst the staff that could not be compared with, nor matched at, the other PO radio stations.

The staff settled into the nearby communities and became renowned in the local towns for their carnival floats in summer and during winter their home-produced pantomimes which earned money for local charities. The carnival floats were always replete with firework-bangers, soap bubbles and water jets to spray the onlookers. For the pantomimes we were fortunate in having on the staff the late Eric Mortimore, who as a baritone had won prizes at the Llangollen Eisteddfod and also at the Southport Festival. His singing gave a professional touch to the activities. The scripts were produced by another member of the staff, Dick Hearsey, and were certainly of a professional standard.

Floods, and still smiling





“The show must go on...”

80m CW (GB2CW weekly transmission) when mains power was down. December '08

Battery on lap !

“An alternative power source ?”

Adrian ‘JetPower’ at Telford Hamfest September '08. Adrian mostly stayed in the background watching people’s reactions ! (out of picture here too)



“Who remembers ?”

This Ex WD receiver photo was taken somewhere in Shropshire. Do you remember where and when ? What receiver is it ? (Perhaps time to re-visit in 2009 ?)

