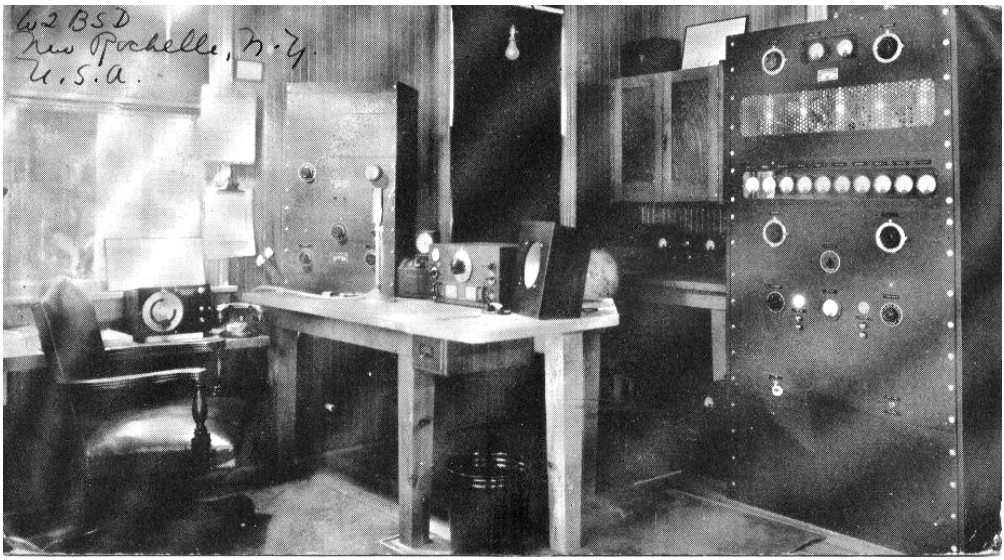
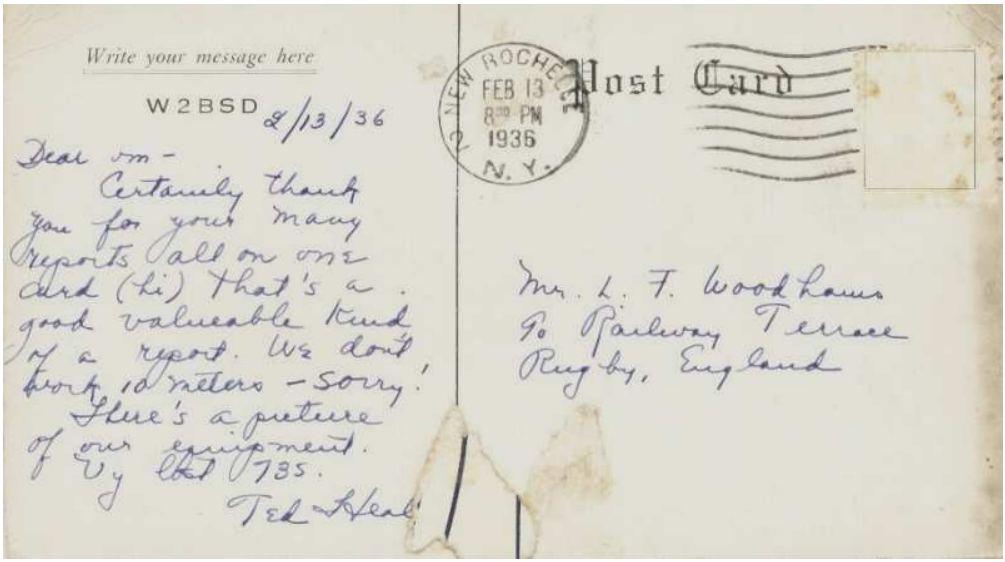
VITAL SPARK

October 2012

www.radioclubs.net/herc
G2LL G1HHH G6HH

HASTINGS ELECTRONICS AND RADIO CLUB





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HASTINGS ELECTRONICS & RADIO CLUB
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Editor

Each time I get a phone call inquiring about training, apart from of course instructing the caller to contact Phil, I always invite them to pop round here to try out listening on the HF bands with my old FRG7, few of course take up the offer. But I am sure many of you would agree it reduces the risk of Phil being asked to provide training, only to find the trainee abandons the course later, such as when they discover compared with using a mobile phone the challenges needed to make contacts on HF, or the lack of activity today on VHF,UHF.
In case you are wondering, in spite of £millions being paid to BT by Government and Councils to help install fiber optic broadband such as in Hastings, it seems unlikely any of us will ever see any change in our connection speed, unless we pay considerably more or happen to live around a mile from an exchange. In fact the Lords Communications Committee has warned about this situation as at **http://tinyurl.com/cwjpbsa** I wonder why home users want to pay some £18 to £35 pm for massive speeds of 38 to 100 Mbps such as for BT Infinity, when the majority of us are quite happy to jog along with speeds of often little more than 2 Mbps. In future please NEVER send any photos to Ron for the VS unless you are able to reduce the sizes to no more than 800 pixels in width or Height. Send them to me instead.

Gordon

Clandestine PARASET Transmitter / Receiver

By Rodney King

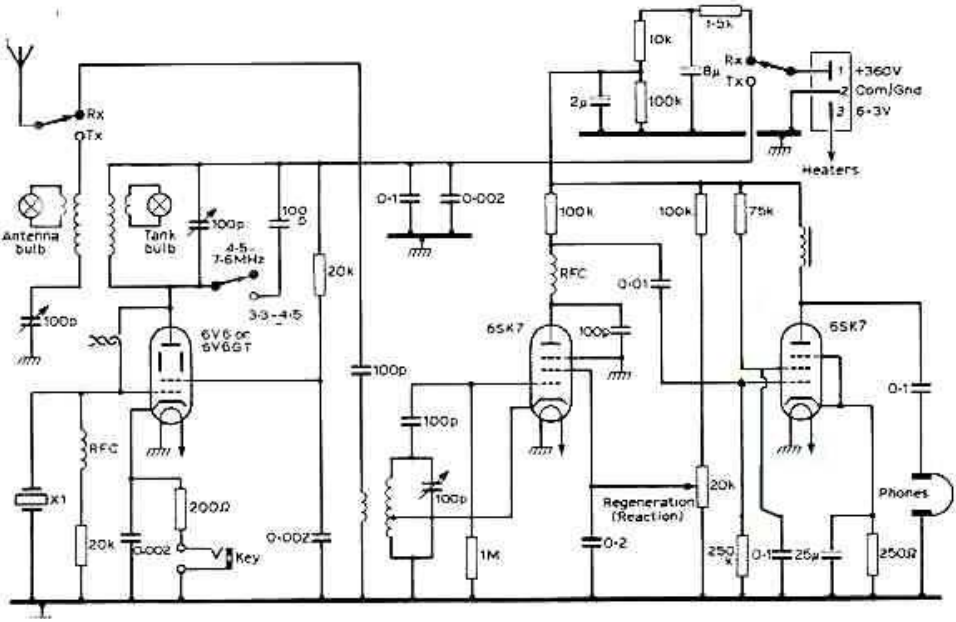
The recent excellent talk and demonstration entitled “Covert Radios” by John Elgar-Whinney has prompted the author to research this subject further from a “circuitry” point of view. Appreciation must also be given to Ben Nock (G4BXD) of the Military Wireless Museum (Midlands) for permission to reproduce images of a replica from his web site.

A transmitter/receiver called the PARASET was developed in England during WW2 (1941-1945) for use by resistance groups throughout Europe. It is the only such radio extensively documented on the internet with numerous radio enthusiasts having built replicas.

It used three thermionic valves which could be unplugged and snugly stored in the lid. Operation was very simple by non-technical personnel without the use of any additional instrumentation. As with other such radios the Morse key was an integral part and accessed from the front panel.
The CW transmitter utilised a 6V6 beam tetrode configured as a high powered (a few watts) crystal controlled oscillator. Feedback from the anode to the control grid was via a low capacitance formed by a pair of twisted insulated wires.

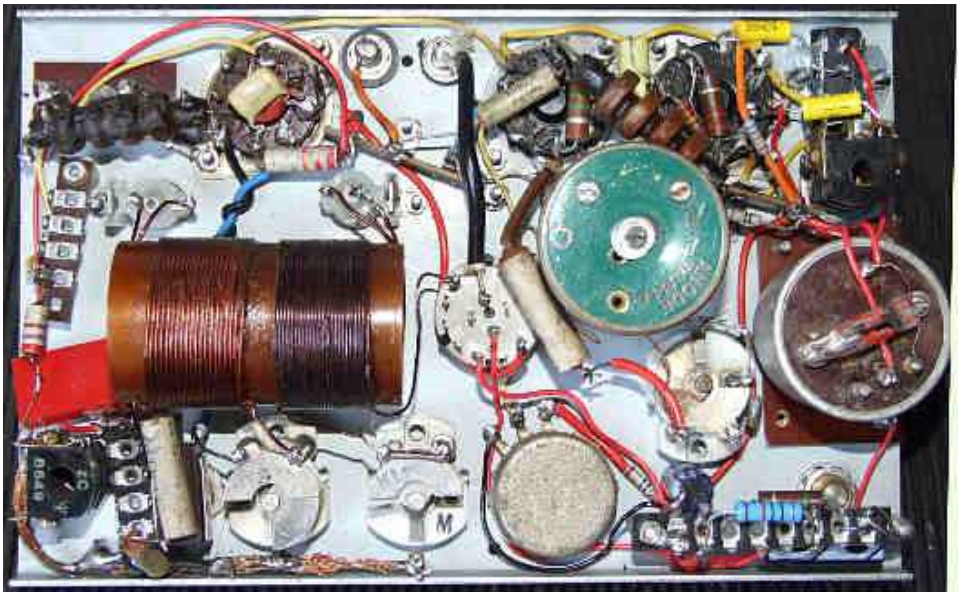
Oscillation could only take place when the parallel “tank” circuit connected to the anode was tuned very close to the quartz crystal frequency. A closely coupled series connected tuned circuit with a similar coil, alongside on the same former, drove an end-fed short wire (i.e. much less than a quarter wavelength) aerial which would have been electrically equivalent to a small capacitance (perhaps around 100pF depending on the length and siting) in series with a low radiation resistance. Adjustment of both the tank and aerial circuits was simply accomplished with a couple of un-calibrated 100pf variable capacitors and tuning indicated by the illumination of small torch bulbs connected to single turn coupling coils just inside each end of the coil former. Unfortunately the indicator bulbs would have absorbed some R.F. energy, reducing valuable transmitted power, but presumably considered an acceptable penalty for simplicity of operation.

The low powered tuner stage of the receiver using a 6SK7 pentode was of a very basic “regenerative” design. A Hartley circuit using a cathode connection close to the “earthy” end of the coil was kept around the point of oscillation with the aid of a “reaction” potentiometer controlling the screen grid (g2) voltage. This time, without crystal control, the receiver tuning capacitor had a 0-100 calibrated dial with a “frequency to dial-reading” conversion graph pasted inside the lid of the transceiver.



Finally a fairly conventional A.F. amplifier using a second 6SK7 valve amplified the audio signal for application to a pair of headphones.

A very striking feature of the construction was that all the coils were located within the radio's wiring area with no screening. Without decent output filtering on the transmitter and direct connection to an un-tuned aerial one wonders what harmonics might have been transmitted. At least TVI (television interference} wouldn't have been a problem in those days! Thank goodness also that there were no semiconductors which would have been killed by so much R.F. energy leaking from the transmitter coil.



Unfortunately restricted space in Vital Spark limits the number of pictures but many more, including coil details, can be found on the internet simply by Googling "paraset radio". For anybody without internet access, the front panel layout is as follows. Moving right from the top left hand corner are connectors for D.C. input power & headphones followed by the two 6SK7 receiver valves, aerial socket, earth socket, 6V6 Tx valve and Tx quartz crystal. Underneath are a rotary Tx/Rx switch, aerial tuning indicator and tank tuning indicator. Along the bottom are Rx tuning, reaction (or regeneration), Tx Ae tuning, tank tuning, frequency range toggle switch and morse key.

As expected other spy radios, including those used by the S.O.E. (Special Operations Executive), can be found but all lack important technical information. Also feel free to explore demonstrations on YouTube.

It is hoped that this short report will provide a useful supplement to John Elgar-Whinney's recent talk.

P .P. Eckersley and Sir J.C.W Reith - More Secrets

Quite recently the BBC vacated Bush House and relocated the World Service in new accommodation within Broadcasting House. One of the newly acquired rooms there is named the Eckersley Room and perhaps represents just a small beginning towards the Corporation's long position (pretence?) that Peter Eckersley had never existed. He was the first and perhaps greatest BBC Chief Engineer until his resignation in May 1929 a resignation that was virtually a sacking by Reith.

We must not forget his planning and designing the complex arrangement of main and lower powered secondary transmitters which resulted in the complete radio coverage of the British Isles. His marital indiscretions ought not to have levered him out of the Corporation employ so savagely. For this we must blame Sir John Reith the BBCs Director General. This Scottish self regarded puritan, who incidentally was standing on legs of clay himself at the time whilst getting the approval of his actions from the six Governors. He was behaving as if he had sole command of the BBC.

In the 1930s Peter Eckersley drifted towards the new and growing Fascist

movement represented in Britain by Sir Oswald Mosley its leader. Mosley and his party held opinions and views that were supported by a large section of the middle class. I well remember reading my family's Daily Mail which applauded and warmly supported Mussolini's attack and conquest of Abyssinia, now known as Ethiopia, in the year 1935.Eckersley and Mosley even planned their own Radio Network of broadcasting that would rival and they hoped, eventually smash the BBC. Its transmitter would be located in Europe or the Channel Isles. Nothing came of this concept, but it led later to Eckersley's 'Radio by Wire' system which later became Rediffusion Ltd. Despite his closeness to Mosley, Peter was recruited to M16. whilst his former wife Dorothy was in Germany during WW2 busy broadcasting Nazi propaganda with her colleague the so called Lord Haw Haw. After the war she was tried and jailed for helping the enemy. I don't ever remember reading or hearing about this at the time. The old British cover up

I have copies of the 1928 and 1930 BBC Handbooks and they make fascinating reading. The 1928 book has a lengthy four and a half page Introduction. This is one of the most turgid and boring pieces of prose that I have ever encountered. Here is a short extract.

".....for the same people, matter entirely proper in a hall or a newspaper may be in bad taste or even frankly objectionable in a family group. This is not Philistinism but common sense."

I read a description of Reith which described him thus, "he had his umbrella rolled like a sword, his shoes highly polished and his suit impeccable". Here was the man who insisted that all male broadcasters should wear evening dress and bow ties when before the microphone.

It is recorded that as a youth at Greshams Public School in Holt, Norfolk. Reith became a bully, played much sport and showed little interest in the female sex. He had a bachelor partnership with David Bowser, a young Army officer for many years which eventually petered out. Surprisingly at the time Reith was expelling Eckersley from the BBC for adultery he himself although by then married was actually conducting an intimate affair! This was perhaps known in some circles at the time but remembering how the Press 'clammed up' when important individuals misbehaved they suppressed the news. The Prince of Wales, later King Edward VII had torrid affairs with married women which never appeared as news items in the Press or on the BBC. Fortunately, sometimes many years later, the activities of some 'high ups' become widely publicised in the media.

John Heys, G3BDQ

The Resistive SWR Bridge by Ian G3ROO & Tony G4WIF

see **www.gqrp.com/resistive_swr_bridge.pdf**

The resistive SWR bridge is highly recommended for both beginners and experienced constructors. It is simple, inexpensive to build, can be very sensitive and is therefore highly suited for QRP operation. When the bridge is set to position 2 to enable tuning of the Antenna System Matching Unit (ASMU), the transmitter P.A. stage will always see a lower SWR than is present at the load. Indeed, if it's a dead short, or open circuit the transmitter will only see a 3:1 SWR. Other complex antenna impedance's may present a higher SWR to the antenna socket, but the rig will always see one that is lower and therefore provide some protection to your P.A. transistor. Because the design relies on using a resistive bridge, the transmitter output should be limited by how much power the resistors can safely dissipate. Please note that inductive (i.e. wire wound) resistors should not be used.

Ian Keyser G3ROO explains how it works.... Considering the following statements will help with the following explanation:-

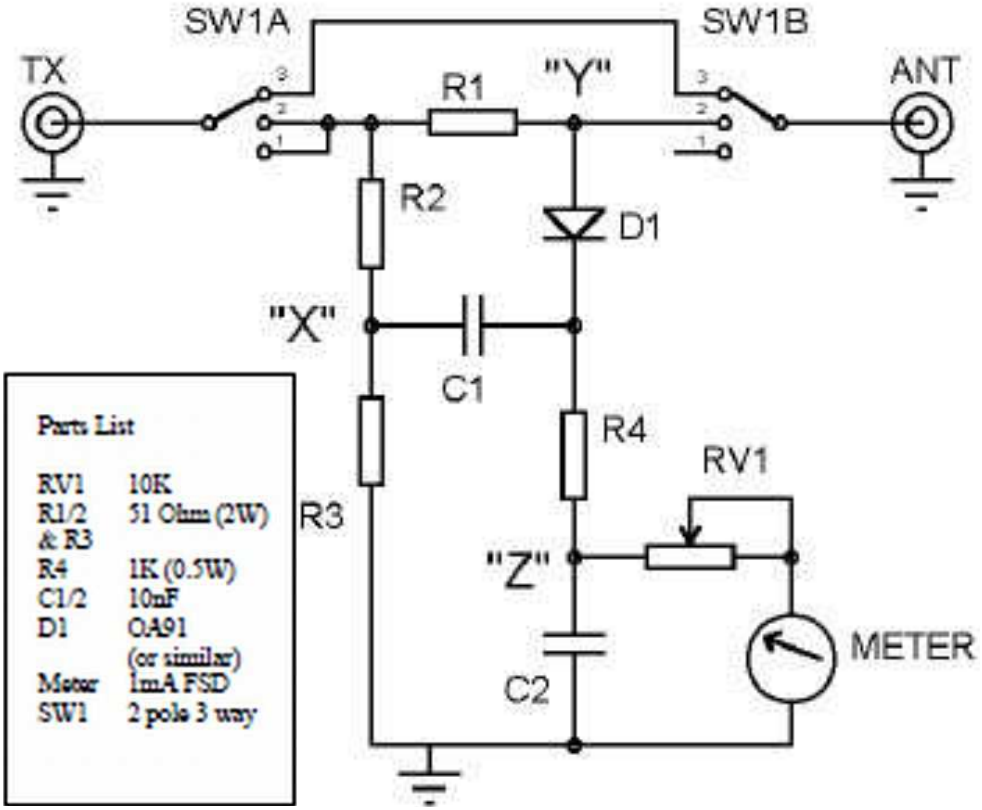
In the interest of simplicity we will assume that the meter draws no current and there is no phase difference between points X and Y. When RF is applied to the input of the 'bridge' the potential at point X will be at half the total RF potential applied to the bridge, and this will remain so at all times. D1, C1, R4 and C2 form a peak voltage detector. Reading the potential at point Y in relation to point X.

We will consider three possible scenarios,

1. In switch position 1 no load (i.e. antenna) is applied and so the bridge is now reading the peak RF input voltage via R1 [50 Ohms], this will have no noticeable effect on the reading. This position can be used to adjust VR1 for Full Scale Deflection.

2. In switch position 2 and with a load of high impedance the RF potential at point Y is very nearly the same as the input RF voltage. In this instance the peak DC voltage at point Z will be almost half the peak RF voltage applied (RF volts input - RF Volts/2 [point X]). Alternatively, if the load impedance is now made very low (say 1 Ohm), RF volts at point Y is almost zero so the peak detector will again read about half the RF input voltage - (RF volts input/2 [point X] - point Y (zero volts [almost]). Between the above two extremes, if the load impedance is 50 Ohms, the voltage at point Y will now be half input RF voltage. As now point X and Y are at half RF input voltage the potential difference between them is zero. This is the point of 1:1 SWR, and as we deviate from this ideal, the voltage detected will rise until the two other scenarios are reached.

3. Having tuned the ASMU (with the switch in position 2), to indicate 1:1 (zero volts), the switch should now be moved to position 3 to remove the bridge and it will connect the ASMU directly to the transmitter. To leave it in circuit in position 2 would divide the R.F power between the antenna and the resistors in the bridge.



The aspect that catches most out is the fact that the meter is connected to ground and not to point X. The reason for this is that as far as the meter is concerned it is only interested in indicating the DC component. If it is connected to earth, VR1 has only to be reduced in value by the value of R3 to give the same reading. In practice, as VR1 is going to be in the order of kilo ohms compared to the 51 ohms of R3, this error can be ignored.

Author: Ian Keyser G3ROO with introduction and circuit diagram by Tony Fishpool G4WIF

Wilf's Random Comms.

Hi again you electro-magnetic communicators and those who insist on setting numerous electrons down a variety of pathways (not necessarily of the electrons choosing). I will start by thanking Jakey (G3JKY) for writing a piece in Vital Spark. Since a purpose of my monthly ramblings is to encourage YOU out there to communicate via VS, the HERC group or even, dare I say it, direct EM communications, as well as to teach me.

CQ refusal

Jakey queried whether a particular foreign amateur did not wish to have a QSO with me because I was a QRP station (about 1.8W). The answer is yes as he was happy to bend my ear, since he could hear me at reasonable signal strength until he learnt I was QRP. Having heard the gentleman on air a fair number of times he appears to be very keen to tell any poor unsuspecting amateur what they should and should not be doing. I obviously should not have been attempting to communicate with him with low power. However, as I have said before the vast majority of amateurs are very helpful to co-operate with my whim to transmit on low power.

Homebrew VHF aerials

Currently with my 2 Metre hand held I can hear the local afternoon rag chew but they don't hear me. Anybody got a design to build a cheap Slim Jim aerial? It has been suggested to me that if I rig it aloft with a coax down-lead I will have problems due to lack of a radials at the handy. What does anybody think?

Winter Evenings upon us

With the winter evenings nearly upon us as this is the time of year when one hears one saying "it seems to be getting darker in the evenings". So one's thoughts may start to turn to practical indoor tasks, NO not room painting and tiling but electronic & radio projects.

In my case a new aerial tuner for QRP use. Should I use air spaced coils or cored toroids to minimize loss of power between Tx and the aerial? If using a toroid how important is it to twist the wires together. There is very little power in this case so minimizing losses has to be a major consideration.

I am also going to design and build a little led light which is switched on by a heat sensor and with a delay to switch off. The unit will be battery powered and I understand that cmos 555 do not crowbar the power rail (ie put a near short across the supply when switching the output). So this would seem a better bet for increasing battery life. What does anybody think?

73 Wilf. (M0GYE)

Chairman's Notes: September 2012

Away Days

Unfortunately the visit to the British Vintage Wireless Society's museum in Dulwich had to be cancelled at the last minute as the curator, in whose house it is, got a hospital appointment that day. Disappointing as that was for those of us who were going, it possibly avoided some embarrassment that a "club visit" was of interest in the end to only 2 members! At this month's meeting, the Committee debated why Away Days had attracted so little support. We've had no feedback from members, other than Bletchley Park was too far to drive and that was why we chose a London venue this year. We concluded that, rather than dispense with Away Days, after talking with members at the next couple of club meetings we might try at least one more time. The proposed venue is HMS Belfast, as that's readily accessible by public transport, and we'll try to arrange to meet the RNARS London Group on board who operate GB2RN from the Bridge Wireless Office. We could also hold the normal club meeting at the Taplin Centre for those who don't wish to go. Although it will be more crowded, it has been suggested that more members might want to go if Away Days were held at a weekend instead of mid-week.

Whatcha' think - we need to know.

Articles for Vital Spark

We've had to stop the series on Op-amps after an eagle-eyed member spotted that it was a straight lift from a web-site, directly contravening its copyright notice which specifically prohibits copying its contents other than for personal use. This is most unfortunate, as the Op-amp text was bog-standard textbook stuff which any number of members could have put together from a huge number of sources. Although the material on the web has been posted for anyone to read, that doesn't mean that it's not copyright and, as with music file copying, increasingly legal action is being taken against unauthorised use of material from web pages, and not just in America. As with copies from books by public libraries, limited extracts for personal "research" are almost invariably allowed but wholesale plagiarism without permission is certainly not. Some sites state clearly that readers are welcome to use the material without restriction, but those are in the minority. Although many do, most are sites don't state whether the material is copyright but that doesn't allow you to assume that it is not. As Gordon has explained in a previous Editorial, the Club policy is that we accept extracts from web sites for publication in Vital Spark only if permission has been sought, unless the site already states specifically that the material may be freely used. If we don't get a reply within a reasonable time to a request for use, we have also decided that we then have "deemed permission", as many webmasters don't bother to reply. We have also agreed that where identical material is published on several websites without reference to a single source, we can assume that material is not copyright.

We always need interesting articles on radio & electronics for Vital Spark, and the web is a treasure trove of information. With the range of interests and wealth of expertise within our membership, we welcome your articles which are the life blood of Vital Spark. So don't hesitate to use the Web as a source of inspiration for your contribution, but please observe the policy above. If it includes a direct copy from a website, advise Gordon of your web source and, if you haven't already sought permission, Gordon can then do so if that is necessary.

Feedback

I hope you are all enjoying the amusing & sometimes contentious contributions from Wilf & Jakey who frequently invite us to respond to their views. Many magazines have "Letters to the Editor" and we would love to see some reply to the issues raised in those columns. The HERC Yahoo Group is also an excellent place to air views and seek advice but so far there are only 11 members, most of whom are on the Committee! The Committee also needs to know what you ,the members, want the club to be doing. Amateur radio is all about communication and **we need to hear from you!**

Next Meeting

After the regular October Auction on Saturday 20 October at the Holy Redeemer Church Hall, the last meeting of 2012 at the Taplin Centre on 28 November is "What's My Thing", an opportunity for informal discussion centred around items of interest brought by members (OK - it's a "Natter Nite")

See you there,

73 de Phil, G3MGQ.

BIG RIGS - Number 1 W2BSD 1936

In this series I shall use Photo QSL cards depicting amateur shacks from the early days to the 1970s. A lot of the equipment seen will be unusual and impossible to identify.

Ted Heal W2BSD of New York has a tidy shack but it houses some unusual gear. I spy the HRO receiver on the operating desk, a receiver that in 1936 was very new and state of art in concept. It cost just over £100 over here at the time. This is more than £2,000 in cash today. Note the huge rack transmitter.
The upper section houses five enormous transmitting valves. Even if a pair were modulator valves the other three I am sure could manage more than the 1KW allowed in the USA. I don't see a Morse key anywhere. Just a ribbon mike. The meters!
John Heys, G3BDQ

AUTUMN AUCTION SALE, AMATEUR RADIO, ELECTRONICS, COMPUTERS & ASSOCIATED EQUIPMENT ETC

By

HASTINGS ELECTRONIC & RADIO CLUB

On

SATURDAY OCTOBER 20th 2012

PICK UP A BARGAIN, OPEN AT 9.00 am FOR ENTERING LOTS,WHICH CLOSES AT 9.45, VIEWING TILL AUCTION START AT 10.00 am

Holy Redeemer Church Hall. Upper Church Road St Leonards-on-Sea TN37 7AS

ENQUIRIES HASTINGS 428428

"The Biggest Aspidistra in the World"

Historical follow up to Wilf (M0GYE) talk last November

Extract from minutes of Ashdown Forest Board meetings.

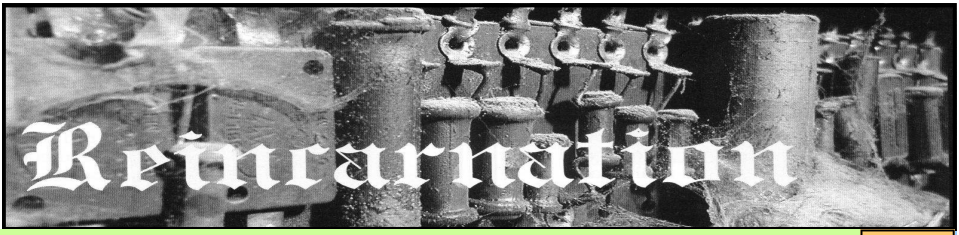
Meeting at The Village Hall, Forest Row October 1st 1941

SECRET. KINGS STANDING. A letter was read from H.M. Government Communications Centre applying for the use of an area adjoining the clumps for the erection of a radio station. Mr. Williamson a Technical Representative of the Centre attended in support of the application and having answered various questions it was unanimously RESOLVED that the application be approved in principle and any details be referred to the Emergency Committee with power to act. In. view of the nature of the application those present gave a pledge of secrecy.

Meeting at The Village Hall, Forest Row June 1943

In connection with the Radio Station at Duddleswell, there have been erected 34 large pylons.

Transcript Historical Minute Book 1942 to 1952 - Ashdown Forest



Looking at the art and science of repairing and restoring vintage equipment, with practical examples

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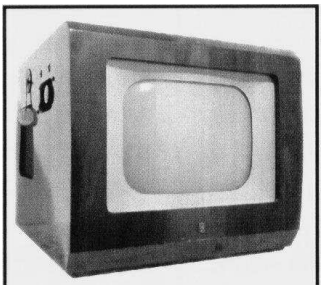
I wanted to pick up the Jubilee theme, with a picture of the 1953 Coronation on the screen of a TV of the period. At the moment the only working 405 line sets I have are too modern, and although there are a couple of hire sets modified with later 625 line chassis, I felt that they would not stand up to the scrutiny of our eagle-eyed expert readership.

What about the 14" Philips 1114UF, which as stated looks almost unused. Maybe slightly late for 1953, but why not try it, and see if it works?



Philips1114UF fringe model TV. Looks almost new inside-but why?

Well, experience has shown that 'as new' old pieces of equipment sometimes are like that for a reason. They may have had little use, like the classic car salesman's "Belonged to a little old lady, sir, only used it to go to church on Sundays", but I suspect that often the reason something was little used is that it didn't work. Also, even if it did, fifty or more years of inactivity is often worse for mechanical end electronic things than continuous use. Capacitors seem to abhor standing unused, modern electrolytics more so than older ones in my experience. I have had several pieces of 'modern' equipment which have been left for relatively short periods, two or three years, and then don't work due to power supply problems.

Anyway, I decided to try the Philips on the off-chance that it would just work and I could put a still picture from a DVD on the screen to get a photograph for the cover. Of course, it didn't. The valves lit up, there was no smoke or fizzing noises, but also no sign of anything on the screen.

After checking that HT was present on the main smoothing capacitors, I was thinking of calling it a day when the line whistle suddenly started up. After a while a defocussed area of the screen began to glow. The focus control is on the side, and turning it felt like twisting a rubber band, and looking inside I found it as expected, but typically Philips, a mechanical arrangement of Bowden cables moving the usual circular magnets.

As this was partly seized, the magnets were not moving properly, and aiding them by hand allowed focus to be obtained, but at optimum sharpness, only a was not a pot strangely shaped area of the screen was being scanned. If defocussed, the

area increased. I at once suspected that the ion trap magnet may be out of adjustment.

If you are not familiar with old TVs, a quick word about this device. Early CRTs were found to suffer from a darkening of the centre, which was found to be caused by the heavier ions in the electron stream, which were less affected by the deflection coils, hitting the centre of the phosphor and causing it to darken- 'ion burn'.

New tubes developed after the war employed a simple technique to avoid this. The electron gun was angled towards the side of the tube neck, and the electron stream was diverted back in line using a small magnet on a clamp round the neck.

The position of this 'ion trap magnet' is critical, only a slight movement removing the picture. It was a well known scam for unscrupulous dealers to twist the magnet on TVs offered for sale in auctions, which in the days when they were valuable would be demonstrated to the saleroom. When the set didn't show a picture, the dealer would shake his head and declare 'Tube's gone' very loudly to his imaginary friend, then bid unenthusiastically.

The magnet position restored a complete scan, but it was only half height and badly cramped. I changed a couple of likely capacitors, namely the frame output valve cathode decoupler, and the feed capacitor from the oscillator. A frame output stage is just an audio frequency amplifier like the output of a radio, and although it does not need a lot of band-width (it is only handling a 25c/s sawtooth), it does need to be linear.

More height, but still badly cramped. A look at the circuit showed several possible capacitors, but worth trying the PL82 output valve first. It looked like the rest, new, but I tried another. No difference.

Changing one or two capacitors had the same lack of effect, then I changed another, which as I switched on, I noticed was not the one I had intended to change. (Horrid black pitch covered unmarked Philips things.) However, we now had a splendid raster, all be it inadvertently.

However, no picture or sound could be obtained, and tests with the signal generator revealed that the IF strip and video amplifier was working. Then I realised- my standards converter only gives a Channel lAP signal, and this set came from the Midlands. Perhaps it is tuned for Sutton Coldfield? It has little coils in cans, not marked apart from coloured spots, which the service data says are fitted by the dealer according to the area. Thanks a lot.

I don't really have the equipment to start meddling with coils at this frequency, and I suspect there is something wrong anyway. Putting the signal generator on the vision IF, it responds back to the frequency changer grid, but not the RF amplifier, although the voltages seem OK, and the valve was changed. I would have thought even if the tuning was wrong, the IF would go through the first stage, so maybe one of the coil units is faulty, or they are just the wrong cans, and the set never worked?

Sorry, no happy ending. I couldn't waste any more time. But if anyone has a set of Channel 1 cans from one of those Philips sets, I would be interested to try them though.

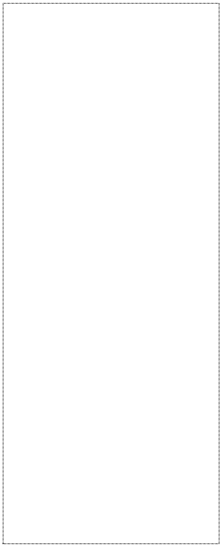
HERC MEETING VENUES

Meetings will be held at the Taplin Centre Upper Maze Hill, St Leonards on sea, TN38 0LH 7pm for 7:30 (except auctions)

On the fourth Wednesday of each month

Auctions will be held on the fourth Saturday in April, & October at Holy Redeemer Church Hall, Upper Church Road, St Leonards on Sea, TN37 7AS doors open 9am auction starting at 10:15am.

If there is any event or anniversary you feel would interest other members, please send the information to the Editor.



HERC DIARY 2012

September 26th	"Medical Electronics" by Steve Balkam in Taplin Centre
October 20th	Autumn Auction of Used & Surplus Equipment at Holy Redeemer Church Hall, Upper Church Road Doors open 9am for Auction at 10.15am.
November 28th	"What's My Thing" - Members' items of interest
December	No meeting

HERC DIARY 2013

January	Annual club lunch.
January 23rd	Talk at Taplin Centre (Speaker TBA)
February	Annual General Meeting