BVWS bulletin

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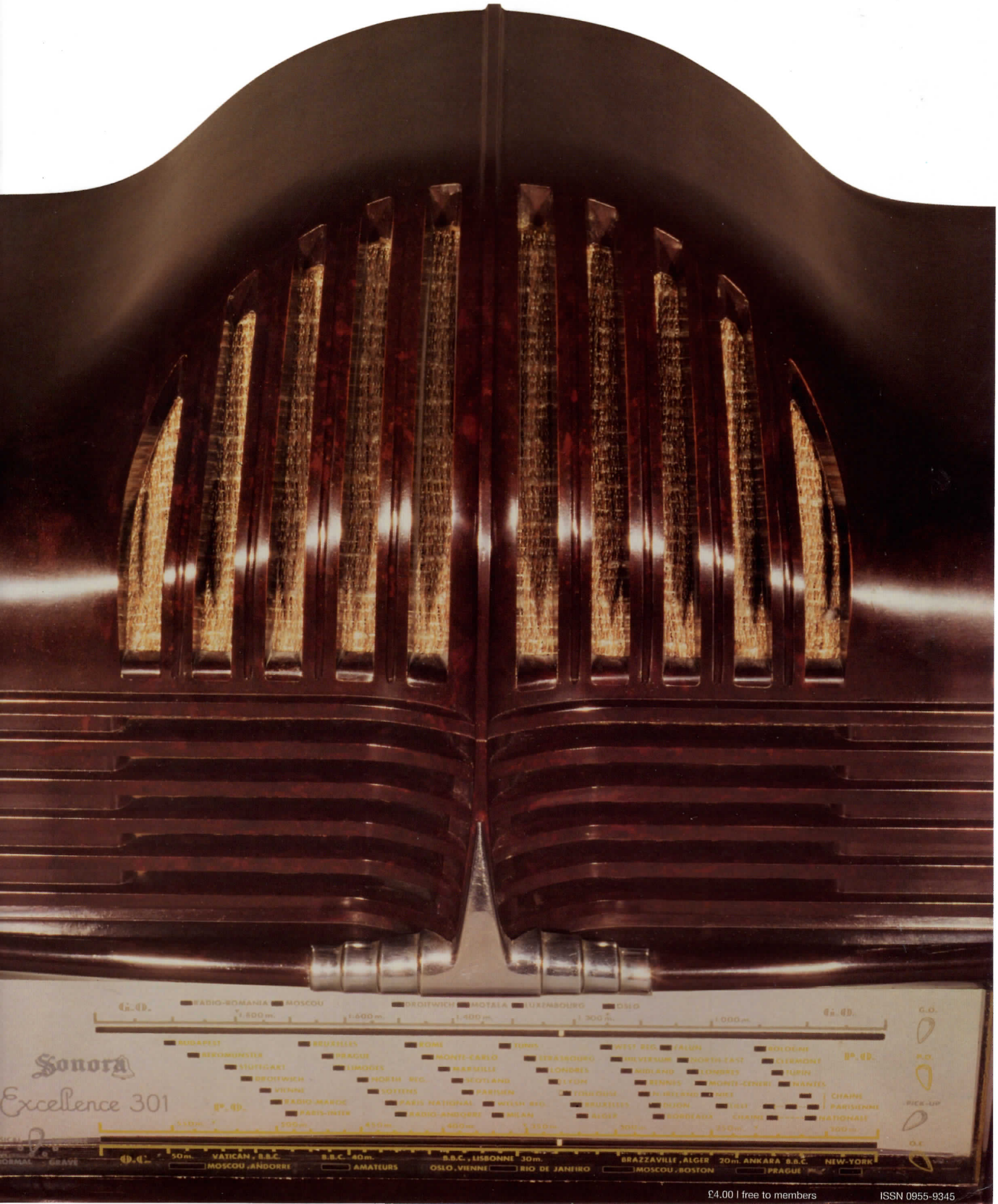

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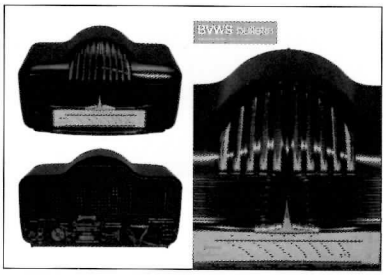

Front cover: Detail of Sonora 'Excellence 301'
Rear cover: Sonora 'Excellence 301' front and back

Front and rear cover photography by Carl Glover
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Andy Henderson and Peter Merriman

Contents

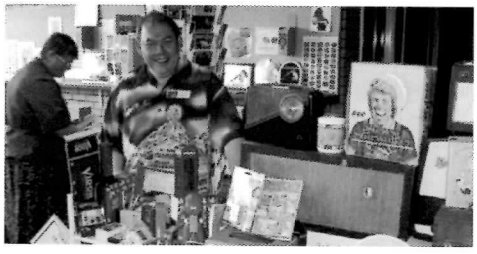
From the chair

What a great summer so far! We have been busy with the events around the country. Firstly the 10th Anniversary Wootton Bassett radio meet, where I staged a big auction of items from several collections, built up over many years. Then we ventured up to the Vintage Valve Technology Fair (VVTF) at Haydock Park racecourse. This is a new event, which we enjoyed greatly. The day was very interesting with a good variety of items and characters. Prices on some stalls seemed high, this was balanced by other sources of components at reasonable prices. Our hosts, Trevor and Steve who put in many hours of hard work organising the event should be congratulated for such a splendid day. It was well worth the hike from Swindon. There will be more photos of the event in the Winter Bulletin.

Another interesting day was spent at Polsden Lacey in Surrey. Each year a celebration day is held. The format being to pick a year and hold a period party with actors taking on the part of guests who might have attended at that time. 1936 was the chosen year and the BVWS were asked to provide a working period radio-gramophone and television. This attracted much interest.

On a more serious note, I would like to draw attention to the increased number of transactions that are taking place between stallholders at events before the opening time. This is a problem that will never go away unless tackled head-on. I understand that stallholders do not have the time to look around and I have taken stalls on many occasions myself, but that does not give anyone the right to flounce the BVWS rules. It is wholly unfair on those members attending the event waiting for the opening time or those who help with the organisation who are also busy. Any stallholder found buying or selling before time will be asked to leave the event. No refunds for stalls or tickets will be given.

It's nearly time for the first BVWS NVCF. Terry and Peter have been working very hard to ensure that everything is in hand and that all the staff are ready. The first one will be a "no change" event and I know that we will have a packed hall. I look forward to seeing everyone there on the day, and if we look like we need a good nights sleep it's because we've been there since 4am! Mike



The Pye is dished up

Dicky Howett reports.

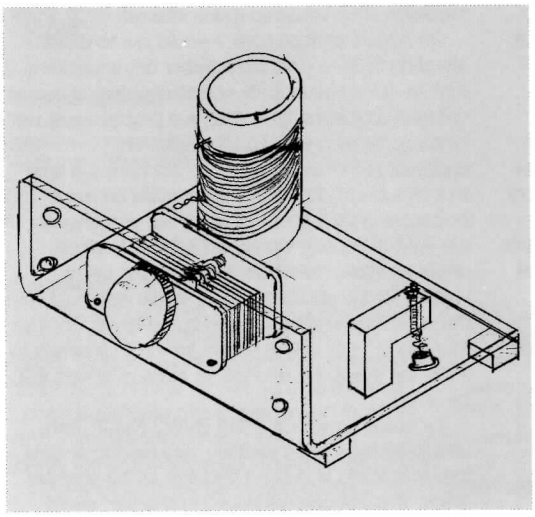
At last it's on the shelves! It's a book called The Pye TVT Story and as the title suggests, it's everything you ever wanted to know (or didn't realise) about the television arm of that famous Cambridge company, Pye. The book, written and complied by Richard (Dick) Ellis -former Chief Engineer of Pye Studio Activity- covers a wide range of Pye's post war tv engineering production. Chapters include, Transmitters, Studios, Closed-Circuit, OB vans and Cameras plus history and comment. The book is compiled with significant contributions from senior Pye engineers respectively, A. James Bennett, Ian Waters, and Mike Cosgrove plus a fascinating account by Mike Gaisford of Pye TVT's commercial dealings around the world. Because several hands have written for the book, there's a certain amount of repetition (and a few reprints from other sources), but this doesn't detract. Apart from the allure of arcane and unadorned television technicalities, the book (342 pages) is leavened throughout with a sprinkling of amusing anecdotes (in one or two cases, baffling to this writer, but no doubt pertinent to Pye people) plus a profusion of photographs, many from the legendary 'Pye Collection' and unseen for fifty years.

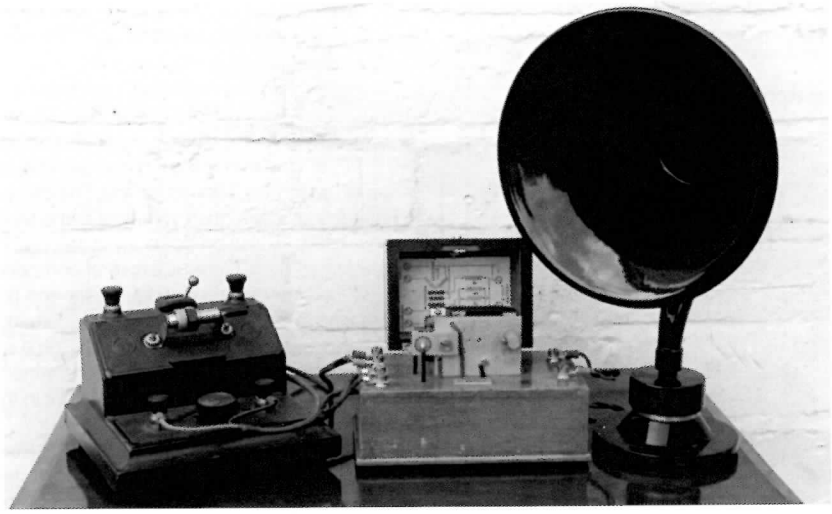
The Pye book itself was mooted originally in 1987 by Richard Ellis. Only now, with the benefit of 'desk-top publishing', has it been feasible to produce something in reasonable quantities that previously would have involved Mr Nat West Bank, linotype, flatbeds and lots of photogravure. The Pye TVT Story is a welcome addition to the growing canon of broadcast histories, (and complimenting the recent IEE Pye biography of C.O.Stanley, 'The Radio Man'). I feel the only omission is that The Pye TVT Story has no index. None the less, recommended.

THE PYE TVT STORY by Richard Ellis. 342 pages. Illustrated.
ISBN 1 89340 17X
£12.50 + £2 pp.
To order your copy send cheque for £14.50 payable to 'R.J.G.Ellis Book'
Richard Ellis, 114 Dixon Drive, Chelford, Macclesfield, Cheshire SK11 9BX.
email: rjge@globalnet.co.uk

Crystal Sets Revisited by LL (Bill) Williams

I built my first crystal set in World War II when I was eleven years old. I can still picture it. It was made using pieces of scrap Perspex, easily obtained from a nearby aircraft production factory. Knowledge of methods of working with this material was imparted by workers who built cockpit canopies and, I remember, had a useful sideline in a variety of non-military artefacts produced from the scrap.





The design of my set must have originated from someone who knew what they were doing. Somebody acquired one and we all made copies. The base of the set was made from a rectangular piece of Perspex which was dipped into boiling water to soften it and then bent to form a flange along one edge. This flange was drilled to take the tuning capacitor and the 'phone and aerial and earth terminals. Four small cubes of Perspex cemented to the base made feet to stand it on. A second rectangle of Perspex was totally immersed in boiling water and when very soft, was wrapped around a wooden rolling pin to make the coil tube. The coil tube was then drilled to thread the winding wire through to anchor both ends and wound with a single layer of enamelled copper wire. The wire was obtained from scrap dynamo field coils for which we had a source. It was probably about 26 gauge and, if my memory serves me well, the winding was 250 turns close-wound for long waves tapped at 60 turns for the medium wave band. The tap was made by doubling the wire back on itself and twisting it. The coil was completed by scraping the enamel from the ends and the tap, and cementing the tube to the base with Perspex cement which was made by dissolving Perspex chips in a solvent which you wouldn't be allowed to use today, and when set it effectively welded two pieces of Perspex together.

The crystal holder was made from a spent .303 cartridge case. These were in almost unlimited supply. The .303 Browning machine gun was the standard offensive and defensive armament on most R.A.F. aircraft. When in action the gun fired 950 rounds per minute and a Spitfire carried eight. Consequently at my school, spent .303 cartridges were the lowest denomination of schoolboy currency. On a good day you would get five for an old dog-eared comic paper !

A cartridge case was sawn off about 3/8" above the rim and a small hole drilled through the centre of the percussion cap through which a brass screw was passed to fix the holder to the base of the set. The cat's whisker was any convenient bit of thin springy wire. What metal it was didn't seem to make much difference against a bit of natural galena but it did need to have a sharp point. This was achieved by cutting at an acute angle. (My Mother never did find out why her scissors suddenly went blunt) The cat's whisker was fixed to the end of a long screw which was supported in a small block of Perspex cemented to the base. Wire connections were trapped under the holder and between two nuts on the cat's whisker screw and that was the limit of how much you could get for nothing.

A piece of galena was 3d at the local bicycle shop. I don't know why but most bicycle shops sold crystals, radio valves, and charged accumulators. You got a decent sized lump about the size of a large hazel nut for 3d and you needed to cleave it into smaller pieces to put into a cartridge case. If you were lucky you got a couple of usable spares to trade.

To fix the crystal into the holder, a small ball of silver paper was pressed into the holder and the crystal pressed down into it. Smaller balls of silver paper were then forced into any gaps between the holder and the crystal with the end of a matchstick until it was wedged tight. The taper of the cartridge case ensured that it remained captive. Silver paper was more scarce than cartridge cases, but Players cigarettes still had a foil wrapper inside the packet, so all you had to do was find a Players smoker who was down to his last cigarette. (No-one threw empty packets down in the street in those days !)

Two more parts were required to finish my crystal set - a .0005μF variable capacitor and a pair of high impedance 'phones. The variable capacitor was obtained from a junk shop for 6d - a whole week's pocket money. The 'phones were a more serious problem as the cheapest second hand ones available were half a crown and quite beyond my reach. My Father who had built most of Scott Taggart's sets in the 1930's came up with a pair of S.G. Brown type F

Far left: The perspex set looked like this.

Above: Bill's home setup utilising a Brownie No.3 set through a S.G Brown Microphone Amplifier and horn speaker.

I visited the Public Library and found a boys' book which explained radio in a simple way. With its help I understood the concept of resonance and how rectification could recover the audio from an amplitude modulated signal.

Right: Cosmos C1.

Far Right: Fellocryst Super.

Below: Brownie No.3

which I still have and use.

My crystal set worked well. It used a parallel tuned circuit which at the time I thought was the only possible circuit. It received one medium wave station and one long wave station (Droitwich). It stood by my bed for several years so that I could listen in at night. In the quiet of the night Droitwich, which was very strong, was audible with the 'phones hanging on the bed rail. This got me thinking. Perhaps Droitwich was stronger because more turns were used when it was tuned. I made a coil with 1000 turns. It didn't work. Why?

I visited the Public Library and found a boys' book which explained radio in a simple way. With its help I understood the concept of resonance and how rectification could recover the audio from an amplitude modulated signal. It didn't stop there. There were valves and short waves and all sorts of fascinating things to find out about.

The end of World War II was a paradise for the radio experimenter. Government surplus, valves and all kinds of quality parts could be had for pennies. There were much more interesting things to make than crystal sets. At the end of the war I left school and it was inevitable that I would work in electronics. I forgot all about crystal sets - after all they were obsolete technology - but I think that crystal sets put me on a path I have followed for the rest of my life.

Fast forward to the early 1970's. A micro circuit fabrication technique required a couple of Kilowatts of radio frequency power. A colleague and I, both radio amateurs, had built a valve power amplifier to provide this. We decided that we would do things properly and hot-neutralise the single triode P. A. under full load conditions. Consequently the protective covers were off with the interlocks disabled and the P.A. was fully visible. Cautiously tweaking the neutralising capacitor with a 2' insulated rod, I became aware that we had attracted an audience of young graduate engineers who had never seen anything like this and were pressing dangerously close. I hastily tripped the anode

I finally got my hands on what may be the finest crystal set ever made - the MK III Tuner. Note, it's not called a receiver. What it does is tune - i.e. it has selectivity.

supply breaker. I told them they were welcome to watch but from a respectful distance. "Get too close and you die!" Total disbelief! I re-set the breaker and pointed to the meters. A little over 3kV and close to 1 Amp anode current. It didn't mean much to men brought up on transistors. "Is that a valve?" "Yes" "Where is all the rest of the circuit?" "That's it. One valve, 4 capacitors, a coil and a choke is all you need".

Some of them had heard about valves - they were used in the old days, long, long ago. They were very fragile, could only last for a few hours and were terribly inefficient. I pointed out that the meters indicated that DC was being converted to RF at about 80% efficiency and said, "If it doesn't continue to do so for at least 10,000 hours, I will complain to the valve maker". They didn't believe it - but it set me thinking. I said to my colleague, "By the 21st century there will be more people who can read Egyptian hieroglyphics than can read a valve circuit. Some-one must preserve some early radios and their documentation before the origins of the electronics industry are lost forever".

A few years later I joined the newly formed B.V.W.S. I was not alone. I planned my collection very carefully. With limited space it could house only fourteen radios. All must be unmodified and fully working. Each must demonstrate an important stage in early radio development. Only three could be crystal sets. Thus began a bit of research into crystal sets. There were a surprising variety and more circuit configurations than I thought. My fourteen-strong radio collection still contains three crystal sets. They have changed over the years but only on the discovery of a more interesting variant or a better specimen. Currently - a Cosmos Radiophone represents early broadcast, variometer tuning with reduced damping by tapping the detector down the variometer windings, and a Pyron (pyrites on silicon detector, rare in British sets).

This page: Mark III Tuner manufactured by ATM Co. Ltd 1918.

Opposite page: Mark IV Tuner, a rare beast indeed.

Over sixty years ago I thought I knew how crystal sets worked. Today I could compile pages full of questions related to crystal sets, the answers to which I am either unsure of or can't quantify.

A Brownie No.3 is a late design using techniques, like mouldings, to get costs down. It is slider tuned with a switched fixed capacitor in parallel to cover long waves and has a metal enclosed semi-permanent detector. This one drives a hom speaker via a Brown microphone amplifier.

My favourite is a Fellows Super Receiving Cabinet. A tapped coil with carefully chosen tapping ratios, parallel tuned by a variable capacitor, with provision for a loading coil for long waves and a Hertzite cat's whisker detector. Another early broadcast receiver, but very different to the Cosmos.

Forward to the 21st century, and backwards to World War I. I finally got my hands on what may be the finest crystal set ever made - the MK III Tuner. Note, it's not called a receiver. What it does is tune - i.e. it has selectivity. Selectivity is the Achilles Heel of crystal sets and was a factor leading to their demise when many stations were operating on medium waves. The MK III. has two tapped coils both with capacitor tuning and with variable coupling between the two coils. It also has both Perikon and Carborundum detectors. These days we are well supplied with medium wave AM stations and once having mastered the technique of adjusting two tuned circuits and optimising the coupling between them, five clearly separated stations could be received on a 100' aerial. Unfortunately I don't own the MK III and it had to go back to its owner. It is beautifully designed but too complicated for a broadcast receiver. It was probably too complex for a battlefield receiver as well. I note that the MK IV has far fewer knobs to twiddle.

Over sixty years ago I thought I knew how crystal sets worked. Today I could compile pages full of questions related to crystal sets, the answers to which I am either unsure of or can't quantify. For example - mention is often made of the end effect of slider coils in which the unused turns absorb energy from the active turns. How significant is this? Subjectively slider tuned sets don't seem inferior to other arrangements. How does a cat's whisker detector work? The cat's whisker (metal) forms a junction with the semiconductor (crystal) which passes current more easily in one direction than the other. Just a moment though! The crystal is in contact with a metal holder and there is no rectifier effect here. The cat's whisker contacts a tiny area and the holder is a large area. Is it the sharp point on the cat's whisker which causes rectification? Perhaps the electric field gradient in the crystal surface under the point is responsible? If a galena crystal is put in an insulating holder and probed with two electrodes, how much bigger does one have to be than the other to make a good detector? It is relevant. Is there any point in setting a crystal in Wood's metal if a single clamp screw serves as well ?

That is just a taste of what I don't know. I have designed some experiments which should yield some answers especially as to the merits of various configurations. When the weather drives me out of the garden this year and it's not too cold in the radio workshop, I'm going to conduct these experiments, and if I survive another winter I will have made another visit and returned with some answers. It's a pity that it's eighty years too late for them to be of much use!

Murphy A52, Fully Featured Listening

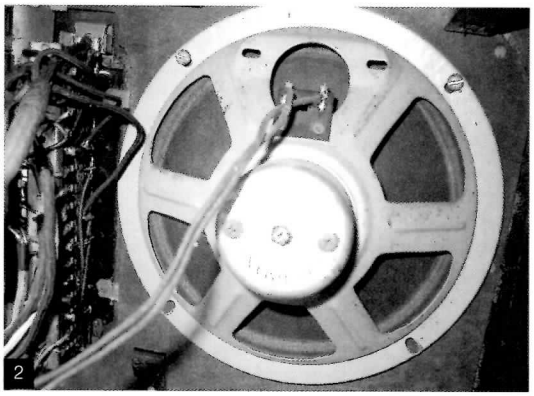
By John R Sully

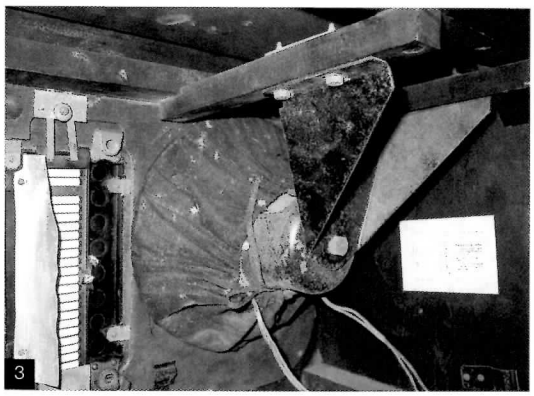
The Murphy A52 was placed at the top of the Murphy table receiver range in 1938. The most notable features included: 5 watt output stage, magic-eye, seven short-wave bands individually band-spread onto a separate logging scale, double superhet receiver design for excellent short wave performance (a technique normally only found in communication receivers such as those by Eddystone for example) multicoloured tuning scale, individual lamps to highlight only the waveband selected, automatic tuning correction, motorised tuning with each pushbutton capable of selecting either a long-wave station, medium-wave station or short-wave band. Quite a list, in fact I am hard pressed to think of any other U.K. table receiver that offered so much functionality before WW II.

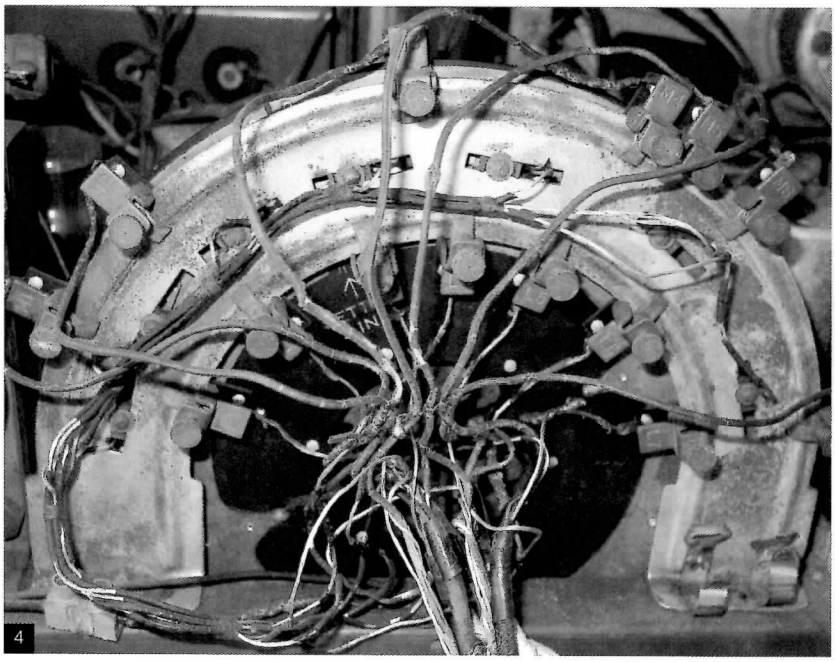
Those with long memories might remember that Mike Barker wrote an excellent article giving a technical overview of the receiver in BVWS Bulletin Vol. 20 Issue 3 back in 1995. However, readers might be interested in the realities of bringing one of these receivers back to life. My example came with an excellent original cabinet, but was in poor internal condition. The only top of chassis item clearly not original was the loudspeaker, which had been changed to a post war non-energised Goodmans unit (fig 2). The Field winding connections at the mains transformer had been bridged with a 75Ω resistor and electrolytics. An email to Mike Barker enquiring about the specifications of the loudspeaker brought a pleasant surprise. Mike had a complete spare chassis for an A52, from a set dismantled due to woodworm infestation. Mike was therefore able to supply me with an exact replacement loudspeaker together with the substantial locating bracket. The original speaker was suspended from the cabinet roof such that the frame of the speaker is not fixed to the front of the cabinet (fig 3). Mike also kindly copied the A52 service manual for me.

Restoration could now get underway, and first came a look at the pushbutton unit. Two buttons were jammed in, three did not operate and the remainder did not latch. Fortunately it only required time to free everything up. Gently releasing the jammed contacts with a bar on a strong part of the switch, and gradual coaxing of the other pushbuttons eventually freed all the switches, and the latching and release mechanism proceeded to work effectively. This process did take a while, but is a much safer strategy than trying impatiently to force the switch into operation. One never knows how many years it has been inoperative, and if one of the paxolin movements gets broken a much greater problem results.

The next item that I decided to work on was the motorised tuning system. The basic principle of operation is the direct homing system, similar to that used by Ekco in their motor tuned receivers. (I will make occasional comparisons to the Ekco motor tuned radio such as the PB189 as they are reasonably common). Designed by Plessey, the same contact disc and rails utilised by Ekco were also to be found in other motor tuned receivers of the period, for example Defiant and McMichael. The Murphy A52 does not use these common components though. On the A52 each pushbutton is used to select either a LW or MW station or a SW band, this means that there are three







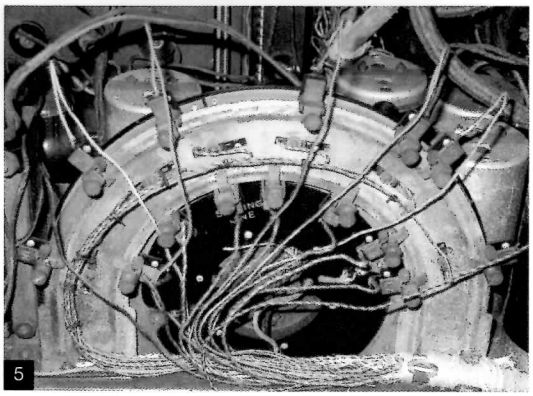


Fig 2: Goodmans replacement speaker

Fig 3: Original speaker back in cabinet. Notice the moveable panel with changeable station labels evident now the pushbutton unit is removed.

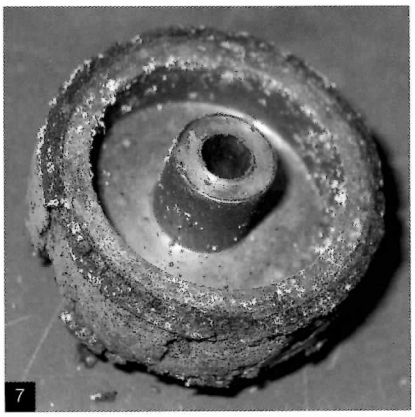
Fig 4: Multi-core wiring before replacement. Notice insulation has disintegrated to expose bare wires.

Fig 5: Multi-core wiring after replacement

sprung fingers per pushbutton pressing on the motor tuning disc. This results in a 21 way multi-core cable to the pushbutton unit, plus a further multi-core cable from the pushbutton unit to provide the manual tuning functionality and control wires. The 21 core cable utilises rubber insulated wires which are then individually cotton covered, bound into groups and then the whole lot is bound again by an external cotton covering. The insulation had totally flaked away in the area of the selector disc, therefore new wires had to be run in (fig 4). Obviously it would be impossible to obtain the exact 21 core cotton covered cable, but I had some old cotton covered multi-core cable scavenged from a closing Strowger telephone exchange more than 20 years ago (which proves that if you hang onto something long enough it does find a use!). The individual cores are not really up to mains power, but would be good enough for the motor circuit at just 24 volts, especially as the motor is only running for short periods (fig 5).

With the multi-core cables replaced the next job was to look at the drive cords. The A52 uses three separate drive cords, one for the short-wave band-spreading device and logging scale, one to operate the main scale cursor, and one to provide the drive from the motor, via the tuning knob spindle to the tuning capacitor. The last of these was broken, but fortunately the run of the cord is not too hard to work out. Normally I'd use my old stock of RS replacement cord, but this was one occasion where I doubted it would take the strain, as the main tuning cord it drives is about 4 foot long travelling in multiple planes and the tuning capacitor is itself a substantial unit. Additionally the friction applied to the motor disc by the 21 fingers under sprung pressure introduces quite a drag on the disc. The motor itself is surprisingly powerful, drawing 2 Amps in operation. Therefore I used heavy duty lacing twine for the motor drive cord. The decision was right as there is clearly quite a lot of torque produced by the motor – when it starts one is left in no doubt it will keep running no matter what until power is disconnected. It is for this reason that a paxolin gear is included in the motor drive train. If a fault causes the motor to run continually the paxolin gear will soon be stripped of its teeth, which provides protection to the motor that is not designed to run for more than a minute or two. (In normal operation the user is only likely to run through the pushbuttons until a station of interest is found).

The next task was to deal with the drive wheels. The same tuning knob is used to tune in LW and MW stations, and also to operate the separate SW band-spreading device. At first sight this might seem unremarkable, but of course is quite a feat. Before considering the method we should perhaps step back a year for a moment. Murphy introduced SW on their receivers for the first time in 1937, on the highly specified A36. This receiver featured the Murphy "Drum" tuning scale introduced that year for MW and LW reception and SW Logging. Short wave reception on the A36 was rewarded with its very own dedicated variable tuning capacitor and control knob. When operated on short wave a separate variable tuning capacitor was used to tune across all SW tuning bands from 13m to 49m inclusive, with "notches" as each band was passed that could be felt whilst



turning the knob. Once the appropriate band was selected, fine tuning could be achieved by use of the logging scale at the top of the tuning "drum" on the main scale, using the other variable tuning capacitor (also employed for MW and LW reception). Like the A52, the A36 was also a "double superhet", so the SW circuitry throughout the A36 was of a very high standard, including the dedicated variable tuning capacitor (fig 6), though all of this increased the price of the receiver. When it came to the A52 one must presume the Murphy designers decided the receiver would be even more user friendly (or expertly engineered?) if a single tuning control could be configured to operate both the SW band-spread and MW/LW tuning.

As mentioned the SW band-spreading device has its own logging scale and cursor, totally independent of the MW and LW cursor, so how to use the same knob to operate two different controls? The solution Murphy chose was to physically move the tuning knob so that it engaged with friction drive wheels dependent on whether SW or MW/LW was selected. This is achieved by mechanically linking the wave-change switch with bars that horizontally push or pull the tuning knob to engage the appropriate friction wheel. Strong springs located within the bars ensure that they maintain their position as pressure from human operators is applied or when the motor is engaged. The centre drive wheel is brass with a rubber drive surface applied to it (though in Mike's example it was bakelite). The short-wave band-spreading device drive wheel is bakelite, whereas the MW/LW drive wheel is milled aluminium. It must be said that it is quite hard to adjust for the right amount of pressure to avoid slipping but at the same time not exert so much pressure that the other wheel is engaged. The pictures (fig 7) show the disintegrated original rubber belt on my wheel, and the wheel after I had glued a new rubber belt to it (fig 8). The grooves in the aluminium wheel were choked from the old disintegrating rubber, so these needed to be manually cleaned out one by one too. Fig 9 shows the proximity of the three wheels under the chassis.

It seems possible that adjusting pressure on the drive wheels was problematical from the start. A milled wheel was not fitted in very early receivers, and the Murphy service manual advises that wheels found not to be knurled should be replaced if seen on servicing, even if they were not at that time giving problems.

With the mechanical elements of the receiver restored it was time to take a look at the electrical side of the radio. It seems as though the receiver had undergone a major overhaul in about 1954, as every electrolytic capacitor had been replaced with new components of that date. A very neat job had been done of this, but the replacements looked a bit suspect, with one of them bulging particularly badly. As these components were not original anyway, it was decided to replace these again with modern components throughout (except one from the loudspeaker field). Prior to restoration Mike also advised replacement of all the white disc ceramic capacitors as he had found from experience they were hopelessly unreliable. In the case of my receiver though every one had already been changed, presumably as part of the major overhaul around

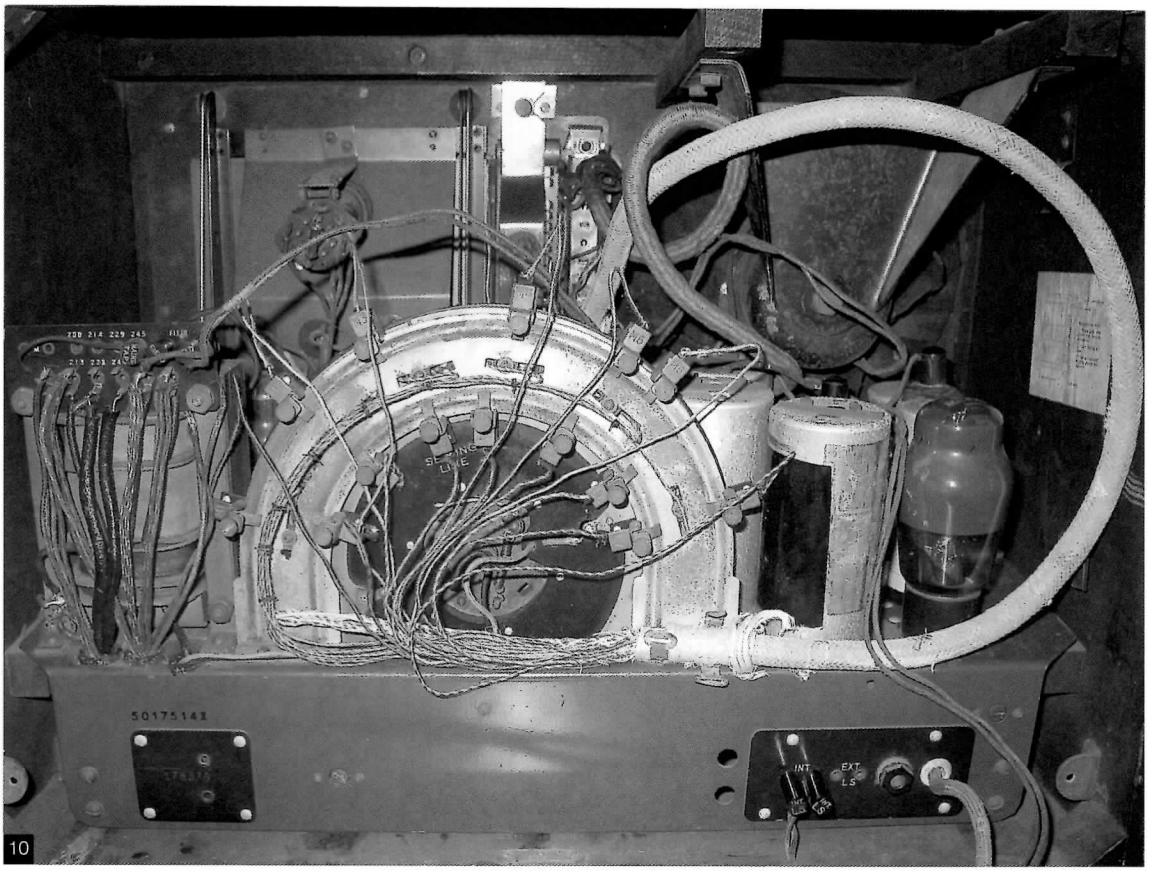
Fig 6: A36 dual variable tuning capacitors

Fig 7: Tuning drive wheel before repair

Fig 8: Tuning drive wheel with new rubber

Fig 9: Drive wheels under chassis

Fig 10: Little spare room inside cabinet



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1954. After a few further checks for obvious shorts and opens, the time had arrived for first power up. Needless to say the radio did not work, and I was met with loud motor-boating. On the plus side the motorised tuning was found to function well. The voltages around the output valve were reasonably healthy, except for the first grid that had about 8.5v +ve on it. The coupling capacitor from the previous stage had already been changed (again from the 1954 overhaul one presumes) but the replacement had obviously deteriorated. With that capacitor changed the voltages on the output valve looked fine, allowing fault-finding to continue without further risk to the output valve or transformer.

Motor-boating is most often associated with problems in the power supply, but a thorough check of this area (and bearing in mind that all the electrolytics were new) revealed no problems. I therefore thought it might be due to a coupling problem at an earlier receiver stage, so decided on a thorough check of every waxed capacitor, a course that could be considered worthwhile in any event. That revealed about a dozen capacitors that were suspect, and all were duly replaced. The motor-boating was still present when I noticed that the SW scale lamp was permanently illuminated. I had also previously noted that some of the contacts on the wave-change wafer switch had been taken out of circuit and some other unknown associated wiring changes made. As there were now no obvious component faults I reckoned that these changes might be related to the motor-boating. As mentioned I had the circuit diagram for the receiver, but a 9 valve (incl rect & TI) double superhet receiver is a complicated old schematic, especially as the wafer positions are not marked on the diagram. So I thought I'd take the easy way out! I knew Mike had an easily accessible totally original chassis, and as Gerry Wells had one of his Wireless Workshops the following week I thought I'd get Mike to bring his chassis to the event, and I would thereby have Mike's redundant chassis as a reference point.

A good idea I thought, but these things never turn out as planned, which turned out to be the case on this occasion. On getting the two chassis side-by-side, I found that Mike's chassis had a different wave-change wafer switch fitted, therefore no direct comparison was possible. The fault would have to be corrected the hard way! Still at least Mike was on hand to provide expert advice! First of all we decided to find out why the SW band lamp was permanently illuminated. The lamp wiring was traced back through the receiver, and found to be terminated on the wrong wiper of the wafer switch. (Not quite as straightforward as it might sound since neither side of the waveband lamps are at chassis potential.) What was strange though was that the apparently correct contact of the wafer had clearly never been soldered. After several re-checks we decided it must be the correct contact, and the wire was duly soldered in position, whereupon the SW lamp worked correctly. So why had the contact never been soldered; it was surely not possible that a Murphy radio could have gone through life with the SW lamp continuously erroneously illuminated? The only explanation the assembled group could come up with was that the

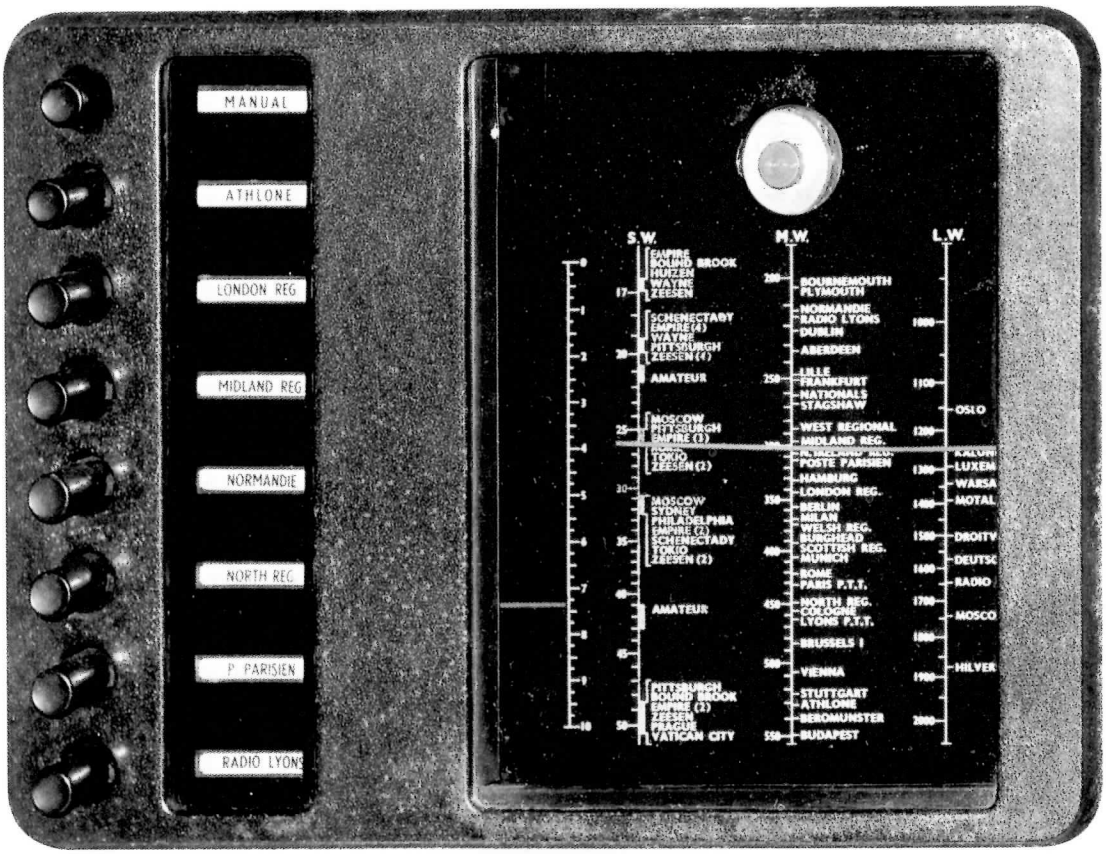

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Fig 11: Tuning scale with independent cursors

wire was correctly positioned on the production line, but never soldered. It made electrical contact until the wiring was disturbed during a subsequent fault. At this point the servicing engineer couldn't see where the now loose wire had been, so soldered it back on the wafer at the wrong point therefore causing the lamp to glow continuously.

The motor-boating was as loud as ever, and Mike said he would take a look. A couple more capacitors were changed just in case (but to no avail), and Mike continued checking around the chassis, also assisted by Malcolm Everiss (designer of the Domino 625/405 Standards Converter). After some time without success Mike noted that the AC/VP2 had been swapped for a VP4B. Although considered an equivalent, they are not electrically identical, so Mike went to swap the valve from the spare chassis, only to find that too was a Mullard VP4B. As everyone was now getting short of ideas it was decided to swap it anyway as there was corrosion around the area where the metalising is connected to the valve base wire, and once done the motor-boating ceased and the receiver straight away starting pulling in stations on MW and LW. So after all that, it was a valve causing the motor-boating. Well that's a new one to me.

Still no short-wave though, so time to continue. The chassis is not particularly easy to work on due to its size and weight. The components are packed in under the chassis, with several screening plates that make access to tag strips difficult, or without removal, impossible in some case. To make things worse there is the pushbutton unit hanging thereabouts together with its two heavy multi-core cables, and not forgetting the pushbutton lamp's bracket.

Mike had by now left Gerry's, but kindly loaned me his spare chassis for comparison. The wiring removed from the wafer switch had to be corrected though. Ironically travelling to Gerry's to take the lazy way out of correcting the modifications finally had the last laugh, as I had to undertake the task myself of correcting the wiring working from the diagram (which it transpired also had an error at that exact point too). With the wiring corrected Gerry came to have a look at progress. Gerry commented that he had never seen one of these chassis, and as it is not often Gerry says that about a receiver they cannot be too common. Checking the AC/TH1 had revealed the SW anode voltage absent, and Gerry had the idea of briefly soldering temporary connections to the wafer switch to look for signals rather than trying to work through the diagram. After a couple of attempts stations were to be heard on SW. Although I did clean up the wafer contacts with light abrasive before re-using them, it is not obvious why the changes to the wave-change switch had been made as no faulty components were brought back into circuit by the correcting of the switch wiring.

Finally the receiver was fully working, and a fine receiver it is too. The motor tuning is very impressive, particularly the ability to use the same button on three wavebands. When the MW and LW pushbuttons are in use the scale lamps are extinguished. In the Ekco pushbutton system, a station label is positioned next to each pushbutton for identification. It would obviously be confusing to have three labels next to each pushbutton, so Murphy has ingeniously linked a

moveable panel to the wave-change switch (as well as pushing and pulling the tuning knob!). The appropriate button labels appear through windows illuminated from the rear by two lamps. As the wave-change switch is changed the station labels are mechanically moved up or down as appropriate such that only the MW, LW or SW labels are displayed. If a pushbutton is already engaged, changing the wave-change switch from say MW to LW will automatically start the motor to select the associated LW pushbutton station. If the wave-change switch is changed to SW, the motor will start up and move the main cursor to the selected SW band, and the tuning knob will automatically drive the band-spreading device and short wave cursor on the logging scale.

As would be expected, the receiver pulls in many stations on MW and LW, and sound quality is very good, with plenty of output power available from the AC5/PEN output valve. However the best sound quality from the Murphy 1938 range was actually available from the A50, the set immediately beneath the A52 in the 1938 range. The A50 featured a 10" loudspeaker driven by an AC4/PEN output valve, capable of delivering 8W of output. Particularly noticeable in the A50 is the output transformer, which is clearly more "meaty" than that fitted in the A52. It is perhaps slightly disappointing that all the electrical and mechanical ingenuity that went into the A52 was not rewarded with the best possible output stage. However the A52 was already retailing at £18.18.0, and the higher quality A50 output stage would certainly have pushed the price above £20, so one has to presume that Murphy knew that a price the wrong side of £20 would have made the receiver pretty much un-saleable. One has to bear in mind that Ekco had a good quality and very popular receiver in their motor tuned PB189, which was retailing for only £13.2.6. (The PB199 is perhaps a better comparison, but did the public, new to motor-tuning, see the PB189 and decide it offered adequate performance and features? After all, a lot more PB189's survive than PB199's) As it is, surviving examples of the A52 seem to be far and few between (or is that because of the number of things that can and have gone wrong with the A52 that were not cost effective to repair!). There comes a point when however advanced and impressive a receiver might be, its technology has simply priced it out of the mass market.

So to return to the opening paragraph. Have you thought of a more fully featured U.K. designed and made table receiver manufactured before WW II? I'll leave you with the thought that there is only one U.K. pushbutton table radio from the 1930's and 1940's on show in the London Science Museum. Yes, you guessed, it's a Murphy A52.

Days that shook the world?

Dicky Howett reports on another of his old time tv recreations.

My picture shows Lion TV director Tanya Cheadle shooting a few frames in super eight (arty grainy stuff) of 'Peter Dimmock' at the 1953 Coronation Abbey tv OB controls, especially recreated by myself and colleague Paul Marshall for the BBC Television/ History Channel docudrama series 'Days That Shook The World'.

For this edition we needed nine fully-operational 1950s Marconi monochrome monitors. We duly arranged all this at a London studio, placing the kit to look like a 1950s BBC tv control room. The big problem was that we didn't have the exact Marconi equipment and had to 'finesse' the gear. In any case, due to our very large collection of antique tv kit we managed to supply what was required, given that there are absolutely no correct period Marconi Mk 2 picture and waveform monitors in working condition anywhere, let alone our slightly later-dated Mk 4s which formed the bulk of the re-creation.

We supplemented the display with several period mics (STC 4021- 4037) plus a selection of Marconi vision switchers, power boxes and audio mixers (not forgetting the green BBC cups and period-accurate ash trays). Also in the display (in this instance a recreation of the portable gallery erected by the BBC at Westminster Abbey) was the 'sixth' camera, (there were five other cameras in the Abbey itself). This sixth camera was my Marconi Mk 2 which was trained on a 'symbolic' caption, used during the unseen Communion service.

In the 'gallery' we fed each monitor with a signal from six standard 625-line VHS machines, each playing a section of the Coronation recording. By staggering the playbacks we got an approximation of each camera angle as if live and on the day. Fortunately for us, back in 1953 each camera shot length lasted sometimes several minutes which meant that by selective cutting we could miss the shot changes on individual monitors.

Our monitors ran all day (longer in fact than the actual Coronation broadcast) and- as on that occasion- we had not a single breakdown. Not bad considering that some of our kit started life nearly half a century ago!

At home with Gerry Wells

Pictures from his June Garden Party

Photographs by Carl Glover

1

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3

1: Gerry has a reflective moment in the front room of the Vintage Wireless Museum.

2: Gerry reads out the answers to his annual quiz.

3: Warm weather made it a pleasant, friendly party.

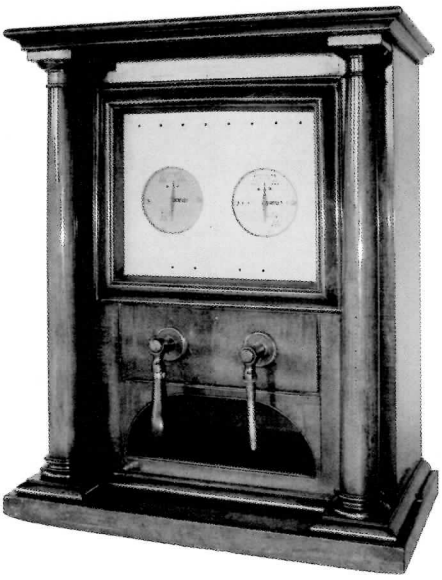
4: Guests entering the party.

5: The programme of events.

6: Gerry making a speech to his guests.

Early British Telegraph Equipment

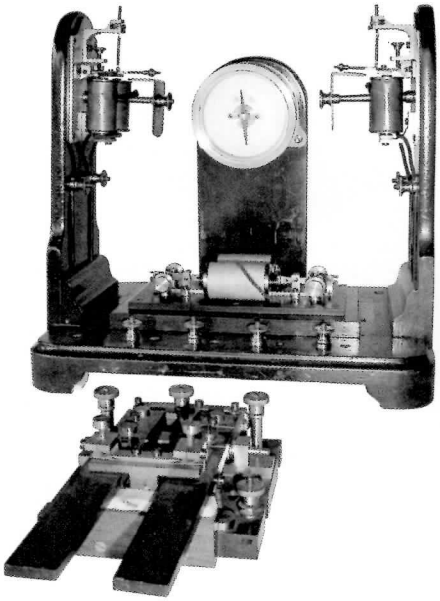
part of the collection of Fons Vanden Berghen.
More on www.faradic.net/~gsraven/fons_images/fons_museum.html
interested readers can easily contact the author at: Author's address: Lenniksesteenweg 462/22; B-1500 Halle; Belgium. fons.vandenberghen@pandora.be



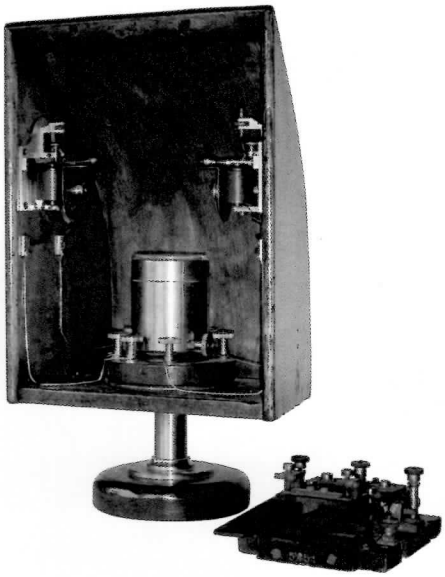
One of the oldest telegraphs on earth. Cooke & Wheatstone started in 1837 with the 5-needle telegraph. To my knowledge only 2 survived. Then came this model (around 1840): the 2-needle telegraph. Note that Samuel Morse only started in the US in 1844.

After the 2-needle, Cooke & Wheatstone designed their single needle model. First with their own code, afterwards they adopted the Morse code.

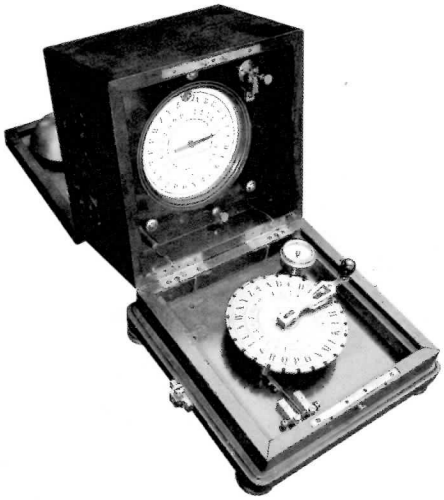
This single needle telegraph came in the 1860's and over the years was installed in almost every train station. Also the Post Office made use of it.

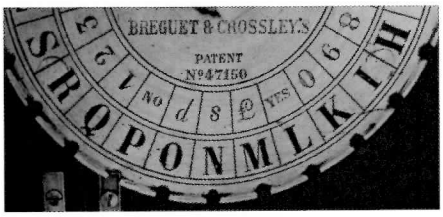


Here you see the "Bright's bells" telegraph. The double tapper key sends a bipolar signal. At the receiver a positive current activates the left hand side plate sounder, a negative the right hand one. An audible "ding" on the left is a dot, a "dang" on the right a dash. Bright patented this device in 1852/1853.



The "double plate sounder" was the successor of the Bright's bells .

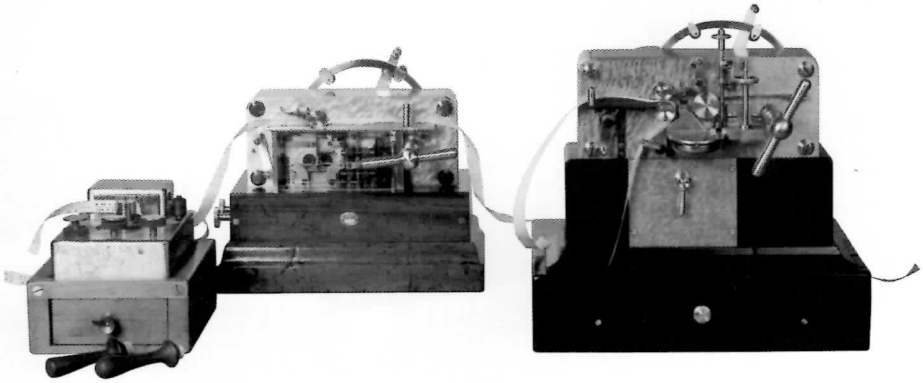




Louis Bréguet made the first telegraph in France, a model with 2 needles, imitating the optical Chappe telegraph ("Foy & Bréguet"). Then, like Wheatstone, he designed an "ABC"- (or "dial"-) telegraph. The one in the picture is a remarkable one, the only one I have seen for use in Britain..

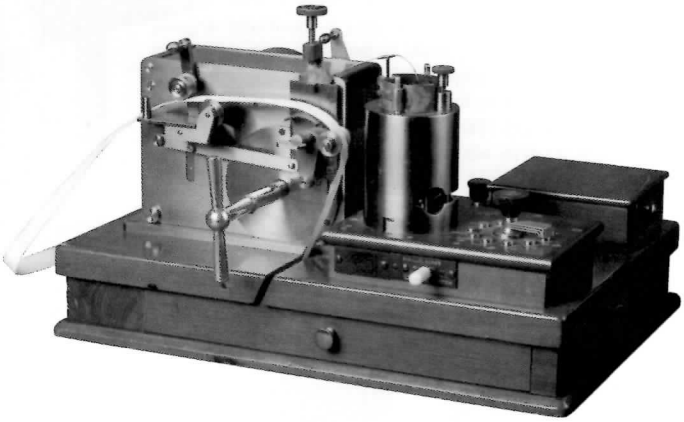
A detail of the dial. Bréguet was associated here with a certain Crossleys. (Who can tell me more on Crossleys?). You see clearly the 'yes', 'no', '£', shilling and pence signs!

Wheatstone designed his first ABC-telegraph long before Bréguet (and others like Siemens). This is a later model: it is the one patented in 1858.

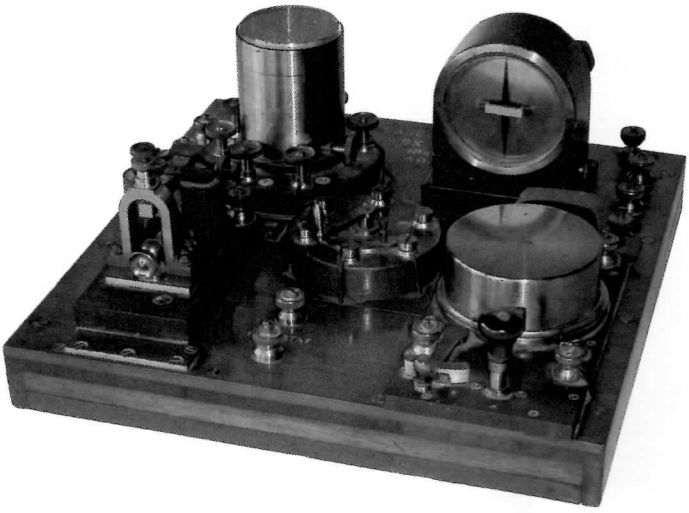


And in the 1870's Wheatstone devised his "fast speed" telegraph. The Morse code was first punched "off-line" on a paper tape. Then that paper tape was read by the transmitter (the speed could go up to 70 steps per second with the weight-driven mechanism!!). At the receive side the Morse code was written down, at the same speed, on a paper tape.

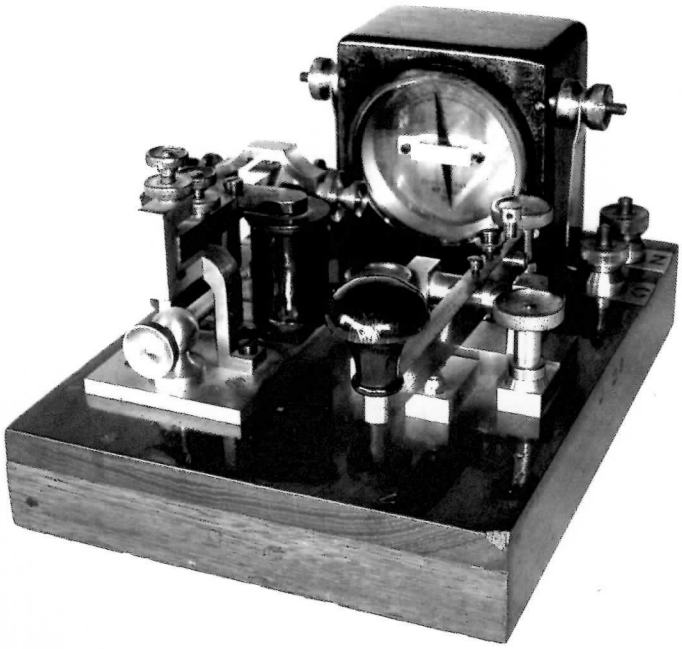
A very nice siphon recorder by the Marconi's Wireless Telegraph Co. Ltd. Siphon recorders were used on undersea cable links as they are more sensitive than normal Morse registers. The siphon puts the ink via lateral movements on the paper tape. Therefore these registers are also called "undulators" (left = dot, right = dash).



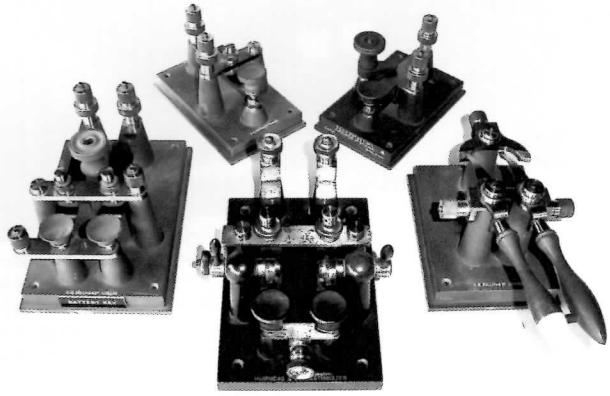
Another siphon recorder / undulator (by ATM-Liverpool I think).



An impressive "extended" Key On Board, including a relay and a switch, used by the Army.



A regular Key On Board from the GPO with the key, the sounder and the galvanometer.

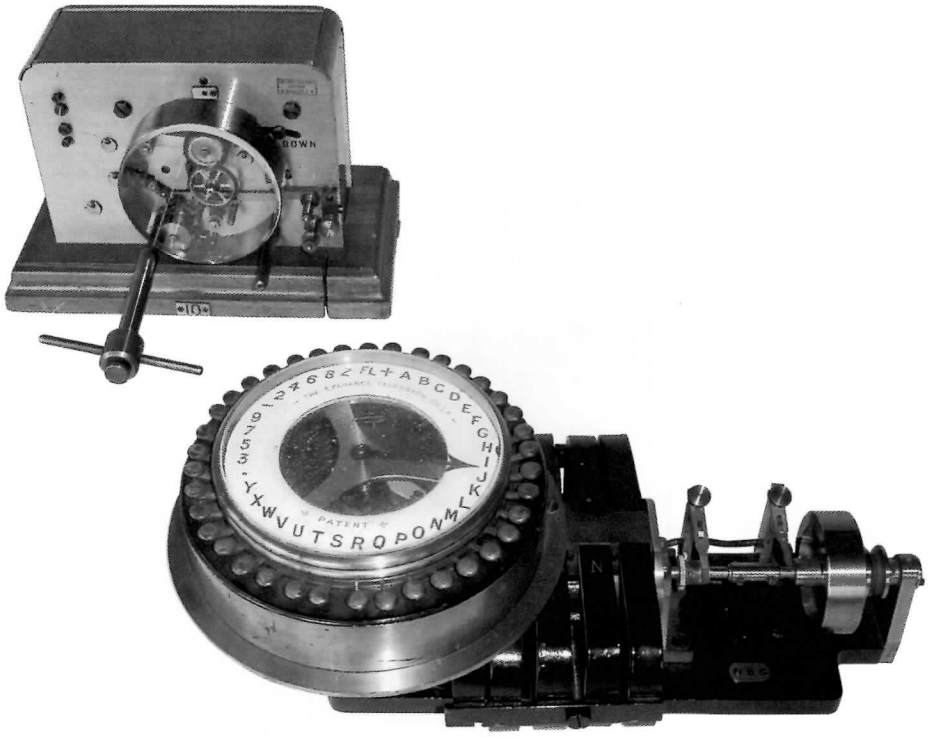


Middle: Three (G)PO keys.

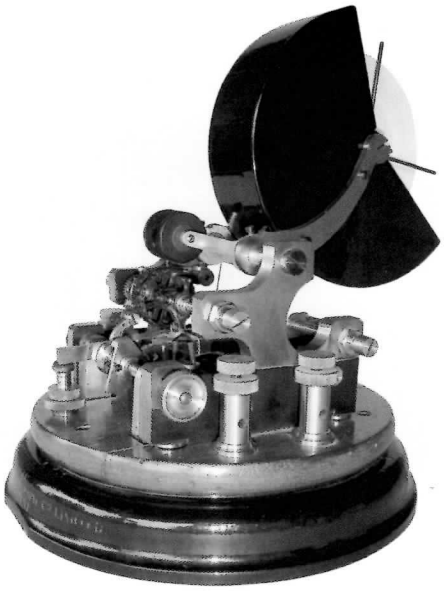
Bottom: Three other (G)PO keys. The middle one is the most common. The two others are really special and rare.

Middle: Two uncommon double current cable keys. They were in use on undersea cables. The left one is British, the right one American (Bunnell).

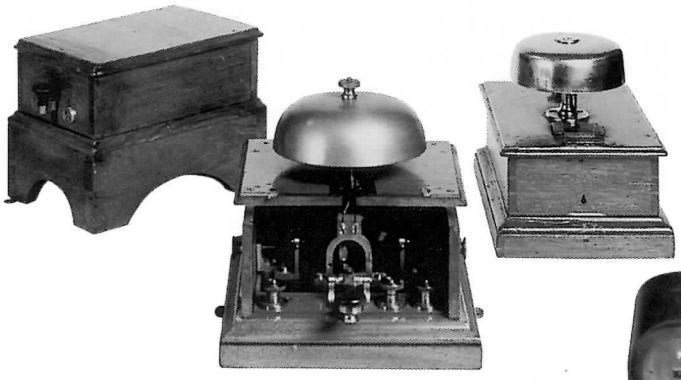
Bottom: These keys were used in central offices in test and measurement systems. The central one is by Muirhead, the others by Sullivan.



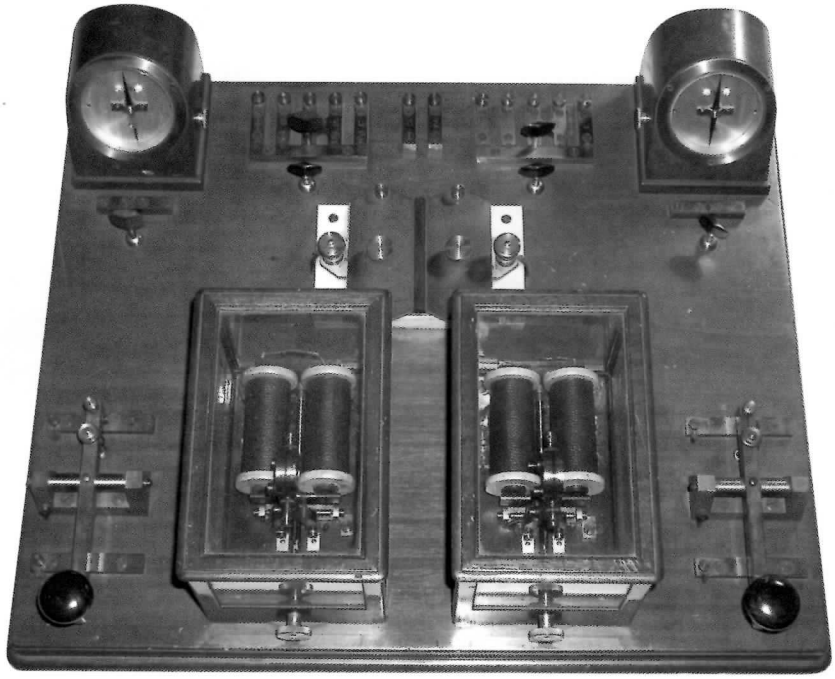
This is a Steljes-type telegraph for The Exchange Telegraph Co.(around 1900)



A stock ticker from The Exchange Telegraph (fourth quarter of the 19th century)



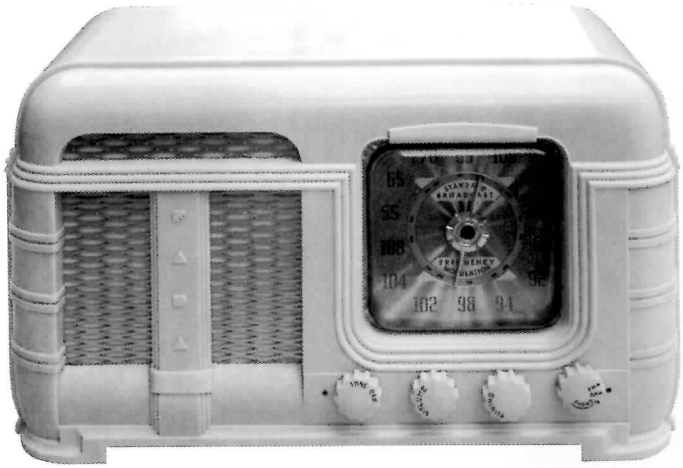
Block bell telegraphs used by the railways. They were used to signal the presence of a train on a particular part of the track (the "block").

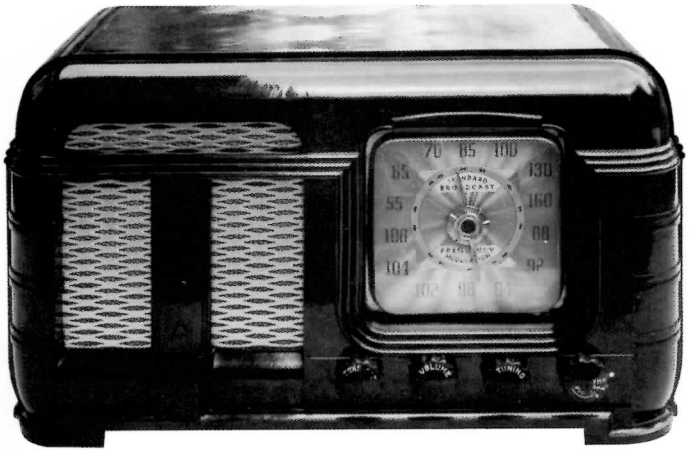


A nice and rare "twin-station" (most probably by Siemens Brothers).

Blonde or Brunette. The Fada 790

By Gary Tempest





I acquired the brown version of this radio first and later the cream model.

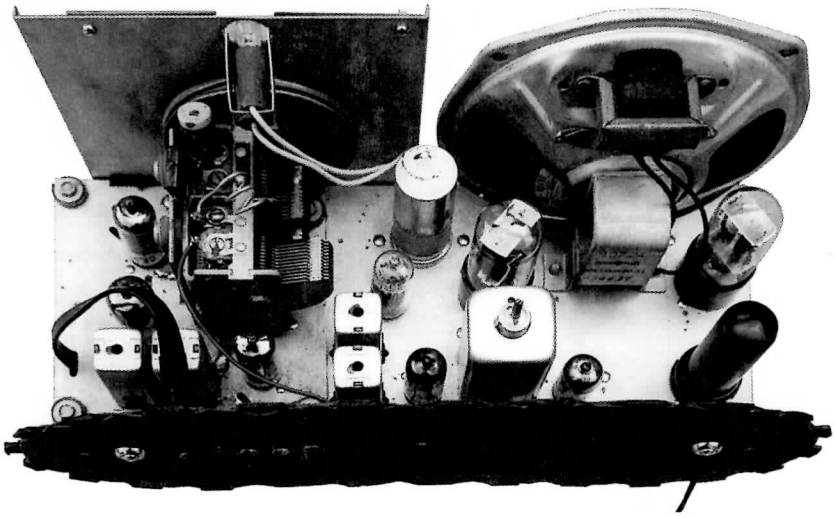
They are AM (BC (broadcast) or MW to us) and FM covering our 'modern' band from 88 -108 MHz. They date from 1949 and to my mind are the nicest looking, small table sets having these wavebands. Most other offerings from US makers are in plastic boxes with external dials and a simple knob as the pointer. These are in substantial Bakelite cases and have a proper dial with an excellent reduction drive. Of course by the time British radios covered the full FM band, the manufacturers were putting them into soulless boxes they called 'contemporary', which I call 'contemptible'. These Fadas even in 1949 must have had a retro look.

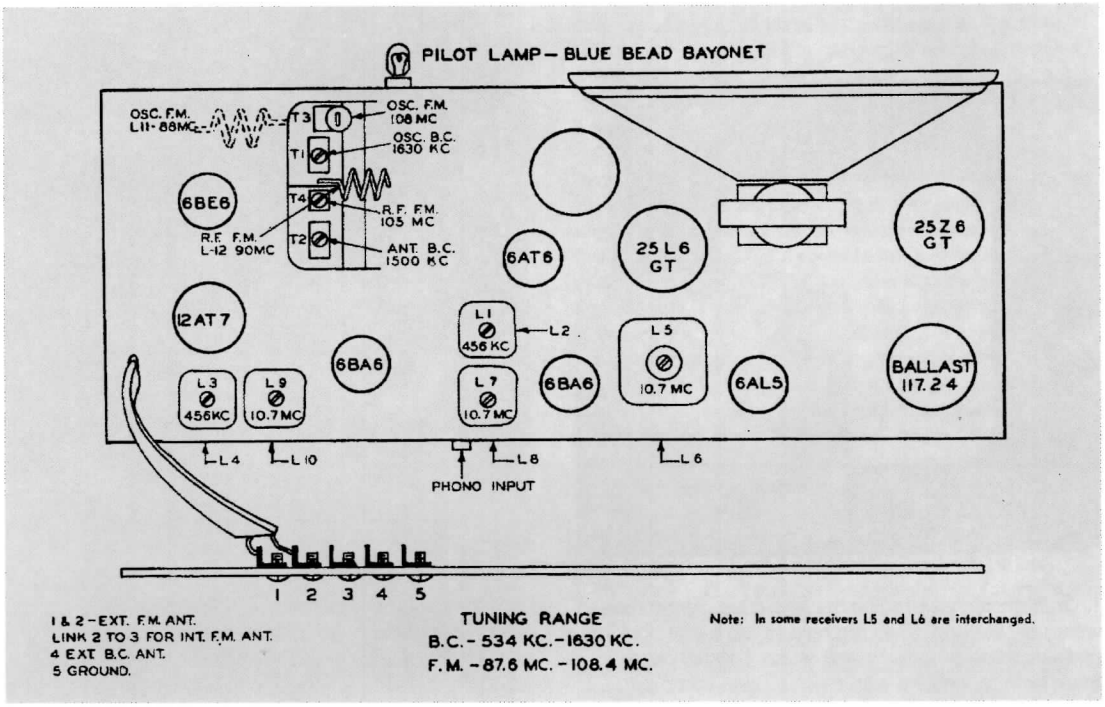
I looked up a little history on Fada. It was started by Frank Angelo D' Andrea (hence the company name) with his brother, in the early twenties. Their ambition was to get rich. Apparently the radios sold well but he was poor at labour relations. He had various strikes of his 500 or so employees and in 1927 lost the services of his chief engineer and second-in-command. This was the beginning of the end and in 1934 the company filed for bankruptcy. It was revived by New York business interest and continued until the late 1940s. It doesn't seem likely that the brothers realised their ambition. But then again maybe Frank did, because he started Andrea Radio Corp in the same year as the bankruptcy of Fada. This company continued to be run by his son F.A.D. Andrea Jr. and daughter Camille after he passed away in 1965. Ref. 1.

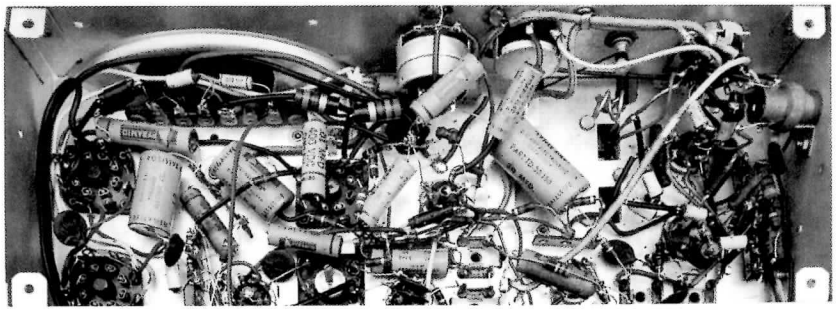
The chassis for the brown radio suggests that it spent time in a damp shed somewhere. The cadmium plating had broken down, in a few places, to rust and the whole finish was black in colour. In contrast, the chassis in the cream model is excellent. The plating looks as if it is only a few years old. When I got it, it had a little green verdigris in places. Beeswax, cotton buds and a soft cloth removed this nicely.

Both cabinets are in excellent condition apart from the cream one having an unusual shaped patch, on top, in a lighter colour. This is even lighter than the inside so I reckon some chemical action must have taken place. Possibly this was from the adhesive from a piece of tape. It completely resists gentle polishing to remove it.

I have included a chassis layout. Actually I also have the circuit diagram, drawn in about the same area. It is not easy to read but it did suffice. The design uses nine valves. Starting at the left, the 6BE6 is used as the frequency changer on AM and the oscillator for FM. The 12AT7 has one triode half used as an FM pre-amplifier (grounded grid) and the other as the mixer. The first 6BA6 is used as an IF amplifier on both AM and FM. The IF transformer primary windings sit one on top of the other. The FM secondary is in the grid circuit of the second 6BA6, which acts as an AM limiter and drives the ratio detector. The diodes for this are in the 6AL5. For AM the IF secondary winding feeds one diode in the 6AT6 for detection. The other diode is used as an AVC line clamp. The triode in the 6AT6 is used for audio pre-amplification on "Phono", AM and FM. The output





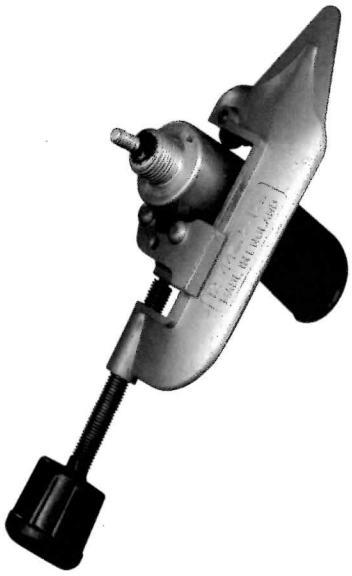


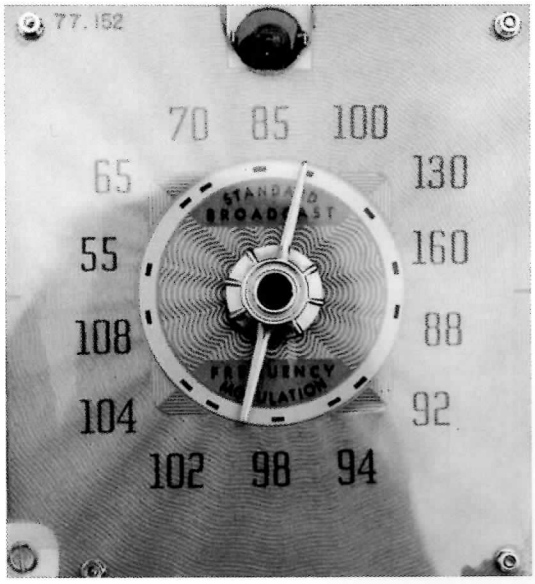
valve is an octal, rather than another miniature type, being a 25L6GT. The rectifier (25Z6GT) and ballast tube are also octal varieties.

You will have gathered by now that the chassis is AC/ DC, with a tap on the ballast tube for the pilot light. Unfortunately, it is of the non-isolated chassis type, with one side of the 120V mains returning to chassis. I balked at converting them but did improve things by fitting new tone controls, with double pole switches. At least the chassis cannot now be live, when the set is switched off, via the heater chain.

Scant regard for safety is paid on these radios, it's a wonder they were allowed to sell them, or people bought them once word got around. The back-cover leaves several areas and screw heads exposed to the touch. I am not selling the radios anyway and always use an isolation transformer. However, I can imagine the non-initiated buying a cheap auto-transformer whence these parts can be live to our even more deadly mains supply.

As you can see from the picture, the underside of the chassis is quite neat even though the practice of suspended components is used. I did re-stuff the wax paper capacitors and the electrolytics. I have a new dodge for the latter. I use a plumbers tube cutter to cut through the can. This is both quick and neat producing beautifully square ends. I used to use a spool of metal pushed into the pieces, to hold them back together, after putting in the new capacitors. But now I use a tough cardboard intended as transformer final insulation. A spool of this can be cut with scissors. I put it into the pieces with a little super-glue. The result is surprisingly strong. As before I finish off with a 'cigar band', printed on brown paper, with the new capacitor parameters, to cover the cut line.





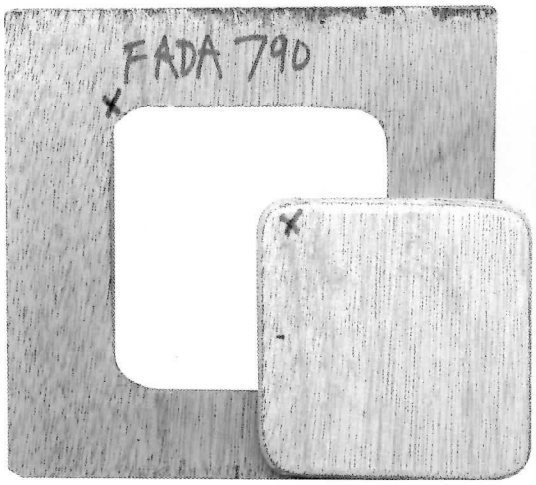
Top far left: Tube cutter

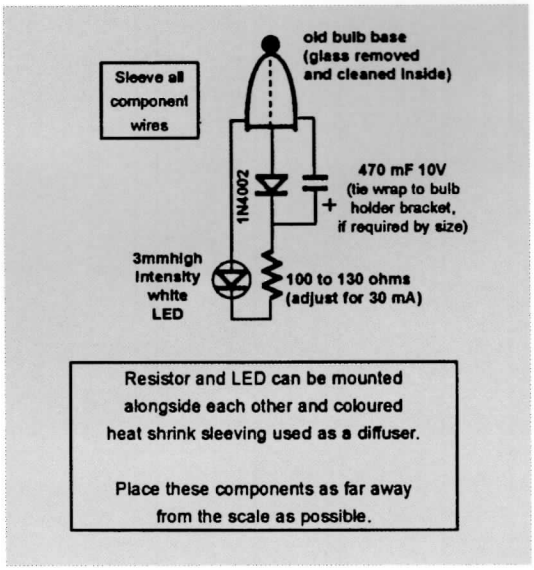
Left: Dial with acrylic sheet

Above: Led dial light in use behind AWA Radiolette dial.

Below far left: Dial cover formers

Below: Led light circuit



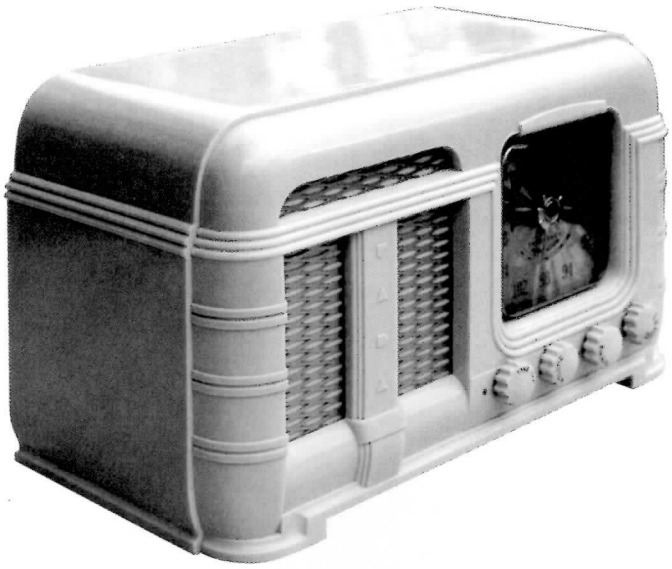


On both of these radios the attractive plastic dials were very warped. They are held to the metal backing plate by three-pronged press-studs. I straightened them both by heating with a hot-air gun and then pressing them flat. But how to keep them like that? My solution was to cut pieces of 2 mm acrylic sheet to the same size. Once I had drilled holes, these were secured over them, using 6 BA nuts and bolts, through the original press-stud holes. A dab of nail varnish on the screws keeps them locked up without over tightening on the brittle sheet.

Some of the smaller valves needed replacing but not the octals, which is often the case, and from there the radios worked upon switch-on. I did an AM alignment in the normal way and then used a couple of methods to do the FM. On one chassis I offset the ratio detector by a couple of turns, so it would respond to AM. Then using a modulated AM generator I peaked the IF's. I now reset the ratio detector for minimum AM which is not very precise. However, what is, is to tune for best audio and minimum noise on a station. This is clearest on a speech programme, on a medium strength signal. For the other chassis I dug out my FM generator and set the IFs without offsetting the ratio detector. I needed the FM generator anyway, because once the IFs were set accurately the dial markings were out with known stations. The VHF alignment was just a matter of tweaking a couple of trimmers and changing the length of L11 and L12 coils (see the layout diagram).

The radios do work very well. FM performance is good with just a length of wire as an aerial. What did surprise me was how effective the internal antennas are. This is simply a 100 pF capacitor, (I have added 600V poly' caps' in series with them) connected to one line input. Ultimately, the small speaker and the lack of a proper baffle limit the audio quality. I did try connecting a fairly decent speaker in a good cabinet instead. The result was so much better. Maybe this was one radio that could have done with extension speaker sockets.

It was now time to attend to the cabinets. After cleaning and polishing I needed to improve the speaker grilles and make new dial covers.
The grills were a sandwich of perforated metal, cloth and cardboard, held together with rivets. Once I had them apart, the metal was resprayed in a matching gold and I had suitable cloth. However, on both, the cardboard was disintegrating due to acid attack. I made one new one out of artist's board and the other from thin aluminium sheet. Both were sprayed matt black. The sandwich was held back together with bifurcated rivets. I knew the one made with card was going to be too thick to mount back in the cabinet, using the same press studs as used for the dial scale. I had hoped this would not be the case with that using metal sheet, but it was. I got over this by cutting off the heads of 6 BA nylon screws, flattening this end slightly to stop rotation, and fixing them in the Bakelite holes, with JB Weld. This is fantastic stuff with great



strength and grip even on plastic type materials. Having now got studs, securing the grill assemblies is easy. You may wonder why I used nylon rather than metal screws. I did this reasoning that it would be easier to drill them out, if someone in the future wants to revert to a more original way of fixing.

Making dial covers is a fun job. I found the method on an Internet site (Sorry, I have lost the URL), but as some of you don't have this I will outline the method. Lay the radio face down on a piece of hardboard or MDF and trace around the dial opening. It may be necessary to glue the board to other pieces to build up a thickness equal to the protrusion of the cover. Having done this, cut out the centre, just inside of the pencil line, using a scroll or fretsaw. Finish the pieces by sandpapering the edges to be nice and smooth. The top face, of the inner piece, can have its edges rounded to resemble the curve of the original cover. Now you need some half-mm acrylic sheet, obtainable at an art shop, and an oven preheated to around 200 degrees centigrade (sorry, I know nothing about gas). Lay a piece of the sheet; normally half is around the right size, over the inner former, with this on a baking tray or up-turned meat dish. Now pop it in the oven. One with a glass door is useful; if not then count slowly to five. If you can see what is happening then by now the acrylic should have drooped down so that its edges are touching the tray (this is my guide). Open the door and place the outer former over the sheet and press down firmly. Now remove the tray and its contents maintaining pressure until the sheet has cooled. From here it's only a matter of trimming to match the original cover and making the fixing holes. I normally do this by melting with a hot piece of rod, heated by a blowlamp.

For these radios the pilot light bulb comes perilously close to the dial cover. I wanted to reduce the heat and stop the bulb lighting up like a firework upon switch on. This is easily done with a couple of back to back zener diodes, across the lamp feed, mounted under the chassis. For a 6.3V lamp, 3.9V zeners (1W or greater) are about right. On one half cycle one conducts as a zener and the other as a diode. On the other half cycle the roles are reversed. This of course only works for a series feed arrangement and for a lamp supplied from a transformer winding then I would use a series resistor.

I have had a couple of radios where the lamp was so close to a plastic scale or cover that I wanted to minimise the heat further than using a dimmed incandescent lamp. Many scales were made from celluloid that I'm told is likely to burst into flame with the least provocation. For these, I made up, in an old bulb base, a white, super-bright LED, with a series diode and current limiting resistor. It does need a capacitor to smooth the half wave supply. No modification is made to the radio. It does work very nicely. Dissipation is down to around 100 mW and with the tiny size of the LED it can be positioned well clear of plastic items.

I had had these chassis out of their cabinets for so long that I had mislaid and forgotten that I had the original back covers. I fruitlessly made new ones, out of artist's card, and sprayed them the appropriate colours, before I came across the originals. Lesson: stick a reminder label inside the cabinet. Anyone need a couple of back covers for 790's?

Ref. 1. My thanks to Alan Douglas for part of this information.

Lunch Box Special

Dicky Howett writes, "What have we here? A triple interest picture and no doubt about it with one for the tv camera fans, the steam train fans, and the steam-tv programme fans. This picture, taken in 1962, features Noele Gordon appearing on that famous and much-missed ATV show 'Lunch Box'. Noele is seen here introducing things live from the track bed of Ripley branch station. Seen also to full effect (in glorious high-contrast black and white) is a Midland compound loco plus a Pye Mk 3 camera and a skeletal 'Paddock' dolly. What more could anyone wish of a lunch break?"

Images from June Harpenden photographs by Carl Glover

1: A beautiful 5-valve Cosmos Radiophone spotted in the large hall.

2: Frenzied activity in the Harpenden hall (photographed at a slow speed, hence blurred BVWS members).

3: A wide array of novelty sets.

4: Primarily post-war wireless equipment.

5: A densely-packed stall featuring a Bush TV22, KB BM20, Philips, Bush and GEC products.

6: An interesting amateur addition of a crystal detector onto a 1923 Ashley 'L.F. Amplifier'.

7: An array of mainly Roberts Radios.

8: A well-preserved 30s/40s set.

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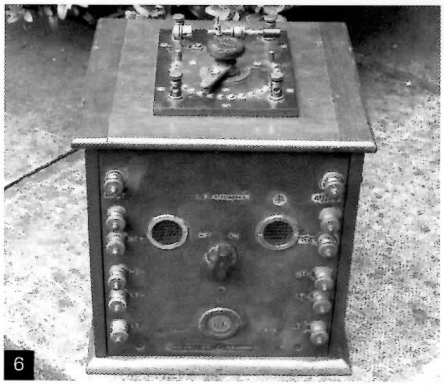

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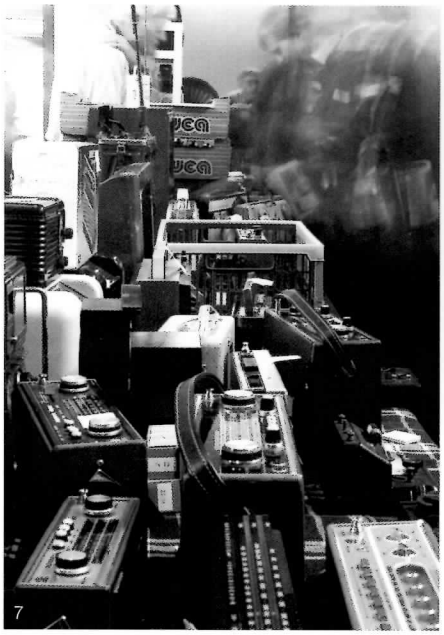

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The Beau Decca Television

by Gerald Wells. Photographs by Carl Glover

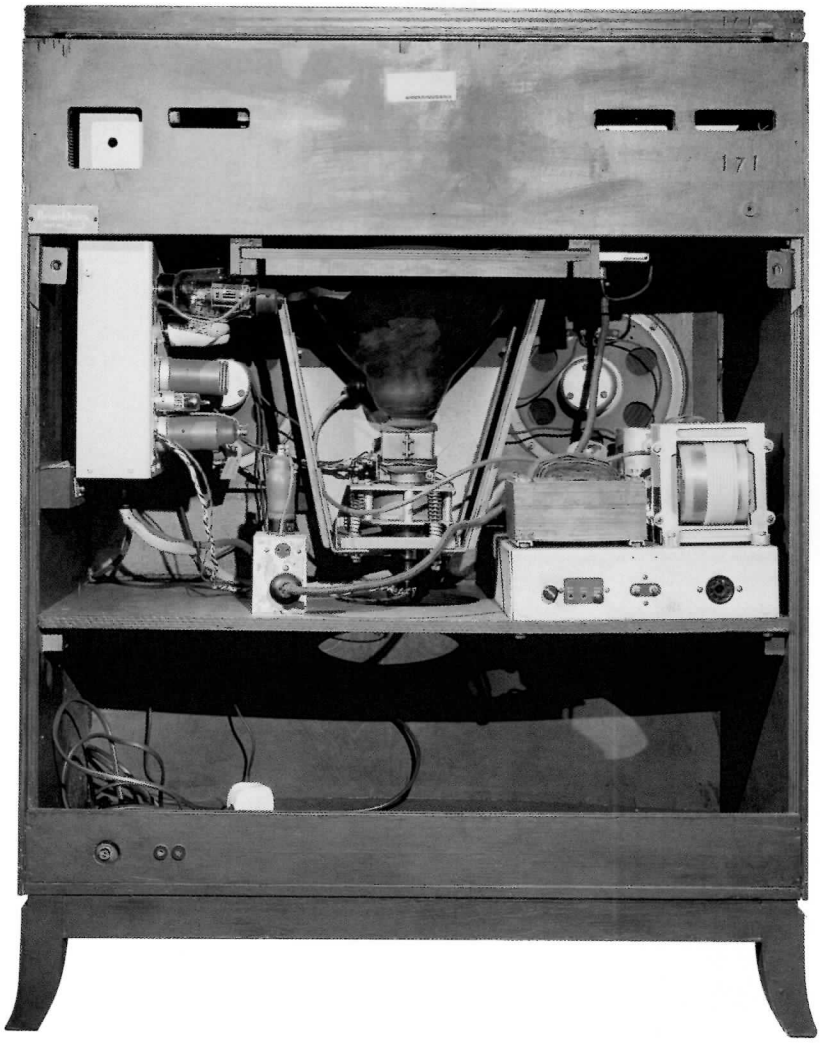
Everybody has heard of the Beau Decca range of products. The only thing Beau about them was the bow front. In most cases the sets were an up-market Radiogram. They came out in 1948, used a lightweight pick up, had three loudspeakers and a pair of PX4s in the amplifier. They are much sought after these days among people who want to get good sound out of their 78s.

It was about this time that Decca brought out their FFRR recordings and their lightweight pick-ups. They did however produce a few projection TVs in the same cabinet. Very few of these still exist.

The Beau Deccas were made in light or dark walnut and a few in birds-eye maple. The overall design was simple and very pleasing to the eye. They stood about 36 inches high, about 24 inches wide and 14 inches deep. The front had a graceful bow to it with many vertical bars or louvres as a speaker opening: in fact I could sum it up by saying that it was a set that would blend into any room setting.

A few weeks ago Kevin came into the workshop with the news that somebody had offered him the remains of a Beau Decca mirror-lid TV. I told him that there was no such animal, I went on to say that the only mirror lid TV that was manufactured after the War was the Ekco TSC92 and they are as rare as rocking horse poo. Kevin assured me that this one was real and that he could get all the bits.

It transpired that the father of an old friend of Kevin's had bought it new in 1948. They used it regularly up until 1955 when it became uneconomical to repair. The elderly father then took the set to pieces. The cabinet remained in the house and was used as a plant stand. The mirror was de-silvered and used in the garden as a cold frame for his plants. The tube and its gantry were placed carefully in the garden shed along with the radio tuner and the power chassis complete with a healthy pair of PX4s. The control panel and speakers were still in the cabinet. The time base chassis and vision/sound receivers were missing.



It must have got lost when the house was cleared after both parents had died. A thorough search of the house and the outbuildings was made. They could not find the chassis. Kevin did however find a cloth bag with all the knobs, nuts and screws etc inside.

Kevin brought all the bits that he had found into the workshop at the museum. The cabinet he took back to his workshop to do up and repair. One of the legs had been totally destroyed by woodworm. Now began the hunt for a service manual or any information on the set.

Everybody I asked said that no such set existed. The only lead that I got was a photograph of a Beau Decca mirror lid that Steve Harris had on his stall at the NVCF. The picture was taken by John Howes, he had never seen one before. I tried every source I could think of for information on this set apart from a certain person in the West Country.

The only thing to do was to work out what the missing chassis was like and how to make one. It was not difficult to work out the physical size of the missing chassis; all I had to do was to get Kevin to draw up the inside of the cabinet showing all the bolt holes and lines in the dirt where the chassis had sat. We then worked out that the missing chassis was the same size as the power chassis.

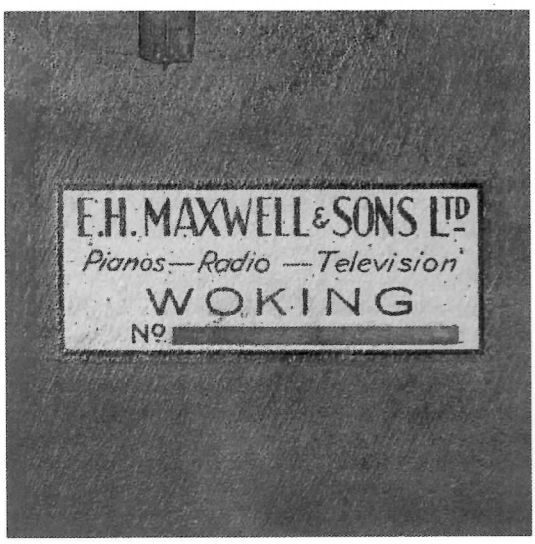
I examined the power chassis and checked that it had no obvious short circuits. I then disconnected the EHT transformer as I didn't want 4KV kicking around. I plugged it in, the sound came up on the speakers, I fed in a signal and got some quite good sounds; of course I realised that I would have to change all the condensers. I then started to make up my own diagrams of the power chassis etc.

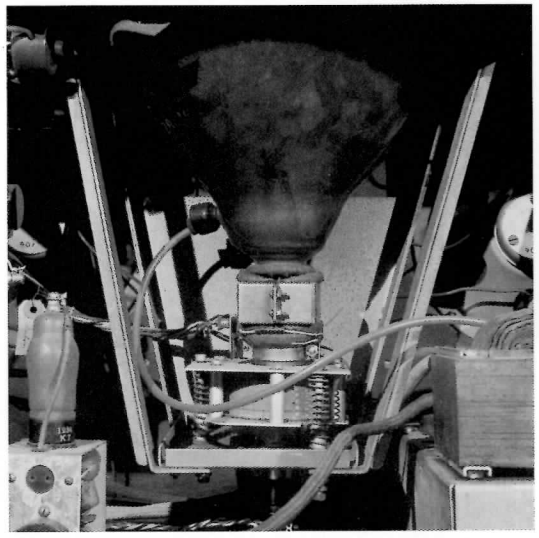
I found that it had a 2 volt 2 amp supply that was obviously for the tube filament, a 6 volt 8 amp supply and a 4 volt 10 amp supply. The HT positive rail seemed to be about 325 volts DC and a 20 volts negative rail at about 10MA. I could only assume that the time base would have used four volt valves i.e. PEN 46 line output, PEN 45 frame output, 2 x T41s for line and frame oscillators and a DD41 as a sync separator.

The vision and sound receivers would have used SP61s or VR65s. I looked through the service manuals of that period and settled on the Murphy 116 for the time base and my version of the viewmaster vision and sound chassis using EF50s (UGH). Now for the ironmongery! I had recently been given a good quantity of sheet steel. I found a sheet that was the same thickness as the power chassis.

I was assured when the steel was given to me that it was mild steel. It wasn't mild steel at all, it was F****** hard. If they had used it on the Titanic they wouldn't have had so many problems. I finally cut it to size on the guillotine and managed to fold it into shape on the folder. Both machines are still groaning. I managed to totally destroy two Q max cutters in my efforts to put in the valve holders. The jig saw is still cooling down after cutting out an 8 inch by 5 inch hole for the vision and sound assembly. This sub assembly I made out of a sheet of 20-gauge brass; this stuff is a joy to work with and is very convenient to solder straight onto. When the chassis was finished I sprayed it in pale grey Hammerite. The rest of the assembly was fairly simple.

Past experiences told me that I could get away with using line-matching transformers for the frame and line output stages. We still have plenty of them kicking around that were left over from our amplifier manufacturing days. The coils for the vision and sound strip I had to wind myself. I had plenty of data on them, all I had to do was modify them slightly for lower sideband working. I then made up all the





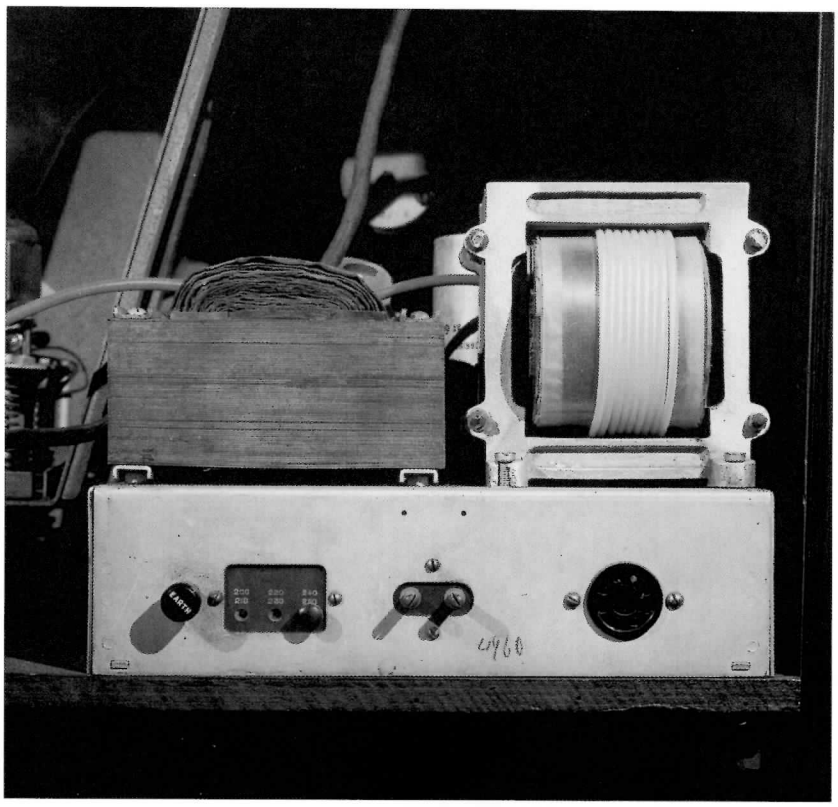
interconnecting octal plugs and sockets. Now was time for the big switch on.

I first tidied up the bench and laid out all the chassis as neatly as possible with a mirror in front of the tube. I switched it on. The EHT transformer lasted for at least 3 minutes before it decided to melt down. In fact just long enough to realise that the tube was perfect.

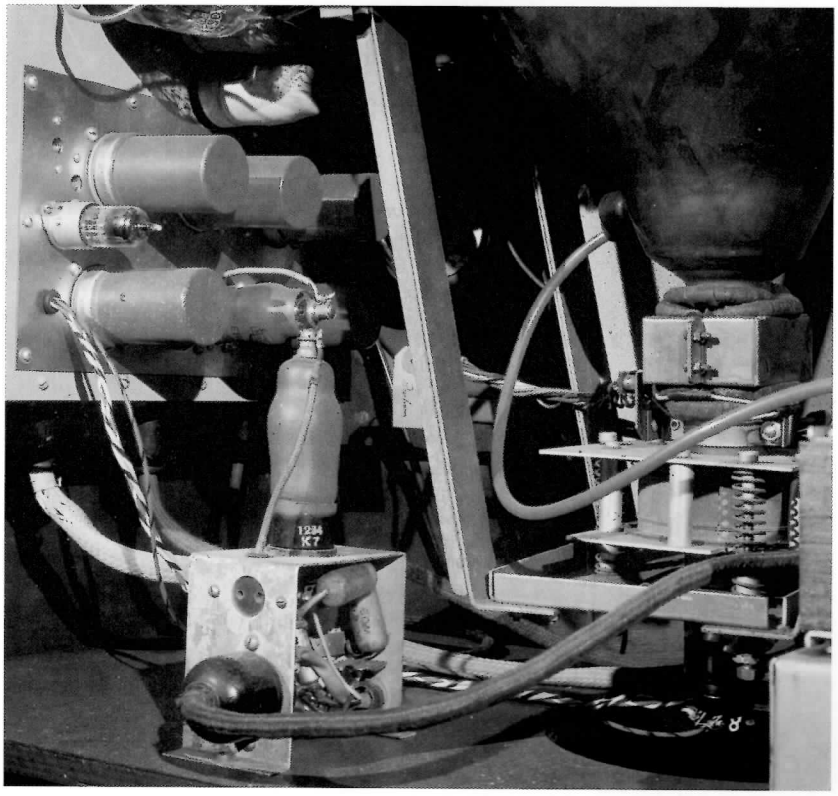
In those early days of television the tubes didn't get time to wear out as the sets spent more time in repair shops than they did in the home. When the smoke cleared and the smoke detectors had stopped chirping, I went up to the house to have a nice cup of tea and dig out my bumper transformer manual.

F.J.Camm produced a wonderful book in the late thirties called "The Coil and Transformer Manual". I reckoned that a primary winding of 1,000 turns of 30 guage wire would do and 20,000 turns of 40 gauge would deliver 4,000 volts on the secondary.

I spent 2 whole days rewinding this transformer, it looked very good. I plugged it in; it lasted a full two minutes before it blew up. I realised that I hadn't used enough insulation between windings. I should have put a strip of paper between each layer. I knew that if I had done this then I wouldn't have had enough room



I spent two days cleaning the rust, old paper and general crud off the laminations.



to get all the turns on.

I went into the transformer store and came out with a rusty old mains transformer with laminations that were half the size again of the original transformer. It was however small enough to fit on the space left by the Decca effort. It had a much larger number of laminations than the previous one. This meant that I could get away with 4 turns per volt. In other words 16,000 turns on the secondary and 800 turns on the primary. I could get away with 38-gauge wire instead of 40 and still have enough room to put a strip of paper between each layer.

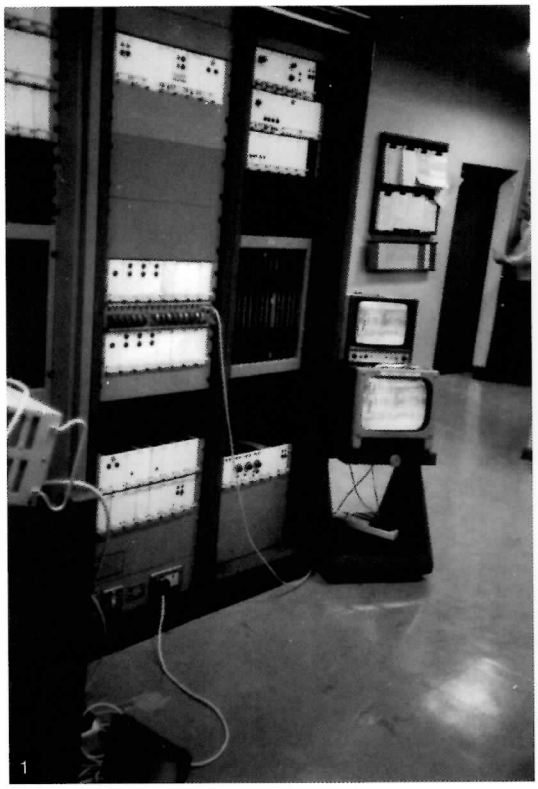
The transformer that I found was rotten and rusty. I did get it apart in the end but it was hard work. The laminations were too rough to use again without cleaning. When laminations are new they have a fine layer of paper on one side only or a light paint spray. This stops the laminations from coming into direct electrical contact with each other.

I spent two days cleaning the rust, old paper and general crud off the laminations. When they were dry I laid them out on long boards and sprayed them in grey primer. Two days later the transformer was finished and I put it the back in the set with the primary put across the 200 volt tap on the mains transformer. I did a test on the mains with the Avo 8 AC milliamps range in series with the primary. It read 50 MA off load. I was well pleased. I then fired it up with the rest of the set.

I switched on the standards converter and got a picture of sorts. I had to do a lot of small modifications to the focus and time bases etc but I did have a picture even if it did suffer from Ferguson distortion (cogging of the test card or clock) and the bandwidth reminded me of the mid fifties Sobell.

After a few hours of alignment of the vision strip I had an acceptable picture; meanwhile, I had forgotten about the transformer. I need not have worried, it was stone cold.

The ITV network in Wales by D. E. Jones



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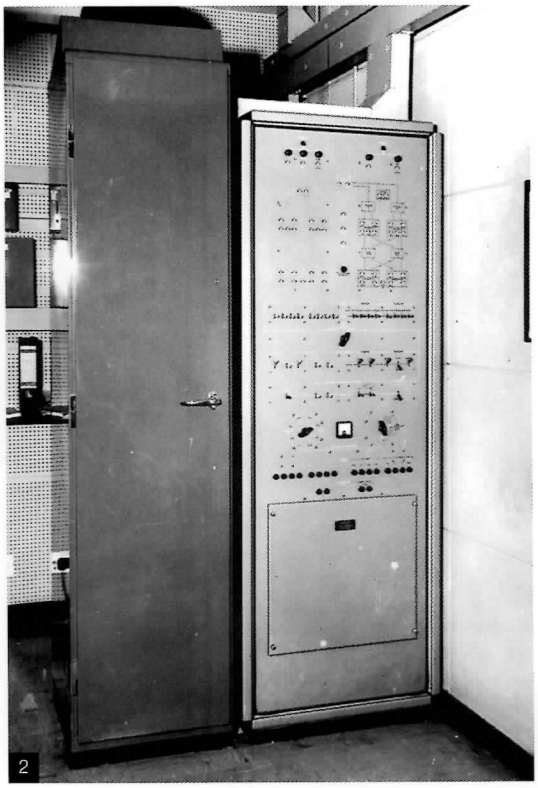

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This article is based on one published in the January 1991 issue of 405 Alive describing the rise and fall of the ITA's 405 line VHF television network in Wales where an unusual solution was found to overcome the problems caused by the topography of the country. Elsewhere in the UK the ITA transmitters were fed directly from the local studio by GPO video and audio links, the exceptions being Strabane in Northern Ireland and Belmont in Lincolnshire where SHF links were used for the programme feed. In Wales a combination of transmitters working in tandem, SHF links and off-air pickups were used to get the programme from the studio in Cardiff to the Moel y Parc transmitter in north Wales.

The article has been extended to briefly touch on the development of the ITV and S4C UHF networks in Wales.

BBC Cymru/Wales was established in 1963 to provide a national television service for Wales. Prior to this the BBC transmitted a combined Wales and West of England programme from Wenvoe on channel 5 in Band 1. A similar situation existed with ITV. TWW (Television Wales and West) transmitted a combined service from the ITA (Independent Television Authority) transmitter at St.Hilary on channel 10 in Band III. Viewers in north Wales living along the coastal belt could receive BBC North from Holme Moss and Granada from Winter Hill. Parts of mid Wales were just about within the fringe areas of the BBC and ITV midlands transmitters.

The new BBC Cymru/Wales service came to south Wales in 1964 with the opening of the Wenvoe Band III transmitter on channel 13 and to north Wales in 1965 when the new Moel y Parc transmitter commenced broadcasting, also in Band III but on channel 6. However, the first national television service for Wales was established six months earlier by ITV and this was more by accident than design.

Initially there were two ITV contractors covering Wales, TWW in the south and Teledu Cymru in the north and west. At the time TWW still provided the combined south Wales and the west of England service whilst Teledu Cymru catered for a then-mainly Welsh speaking audience broadcasting about two and a half hours in Welsh a week. It should be remembered though, that most of the programmes transmitted by all ITV companies were network programmes, with opt-outs for local news and local interest programmes. Teledu Cymru survived less than a year and in 1964 became a subsidiary of TWW. With the opening in 1964 of a second St Hilary Band III transmitter on channel 7, TWW were able to split the Wales and West of England service into two separate programmes. It was at this point that the ITA Welsh network then became Wales' first national network.

The ITV story in Wales starts with the commencement of transmission from St Hilary on 14th January 1958, three years after the launch of ITV's first programmes from the Croydon transmitter situated in south London. Five years later a chain of three transmitters, Preseli, Arfon and Moel y Parc brought television programmes to north and west Wales. Preseli and Moel y Parc were manned stations with main and stand by transmitters together with associated control rooms. Arfon was in fact not a transmitter but a translator receiving Preseli's signal on channel 8 and re-broadcasting it on channel 10. It was controlled and monitored remotely from Moel y Parc. By 1968 remote controlled repeaters at Ffestiniog, Bala, Llandrindod Wells, Llandovery, Brecon and Abergavenny were completed, bringing both the ITV and BBC services to most of the population of Wales.

The evolution of the ITA's network in Wales, whilst part of the UK system, had to take into account the national and linguistic questions. This, together with the topography of the country, required unique engineering answers which resulted in a so called "tied operation" of transmitters. Programmes were

The ITV story in Wales starts with the commencement of transmission from St Hilary on 14th January 1958, three years after the launch of ITV's first programmes from the Croydon transmitter situated in south London.

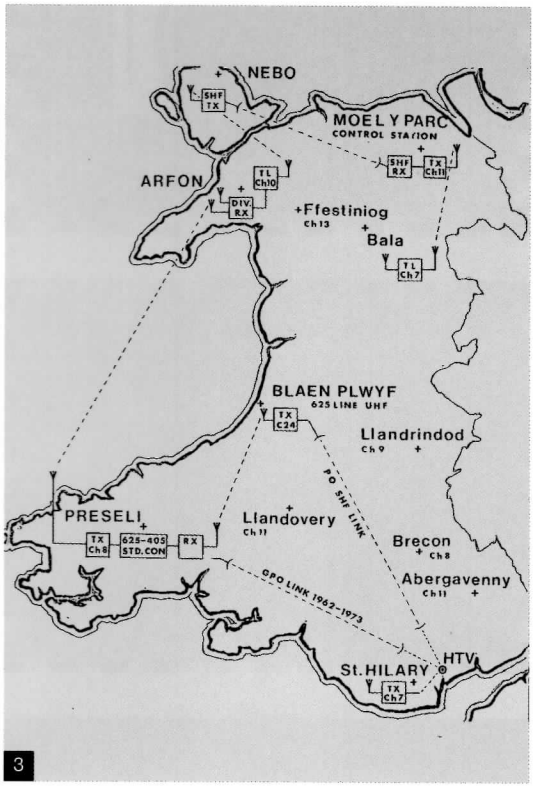
1: Pye standards converter

2: Moel y Parc transmitter remote control cubicle and Pye caption scanner.

3: Map of Wales showing 405 line ITV network.

4: Moel y Parc control desk mimic panel

5: Moel y Parc PIE (programme input equipment) showing from left to right: Main and standby SHF receivers, audio test equipment, video test equipment, and SPG (sync pulse generator) racks.



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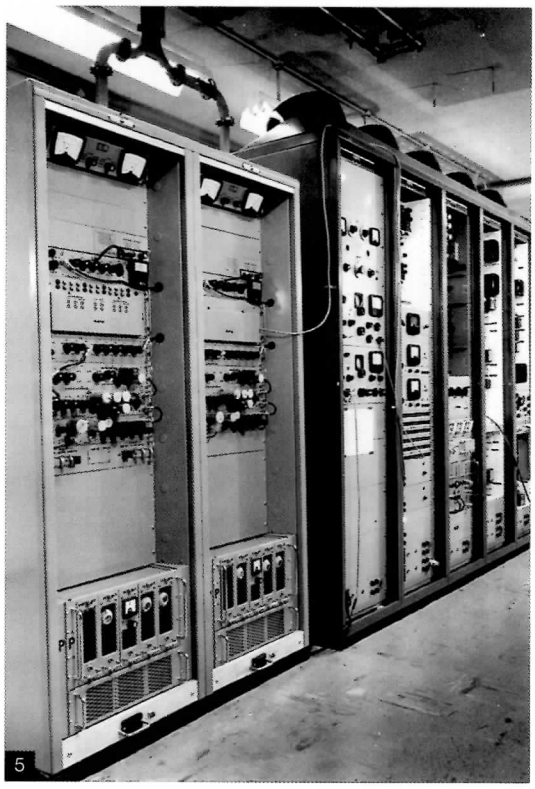
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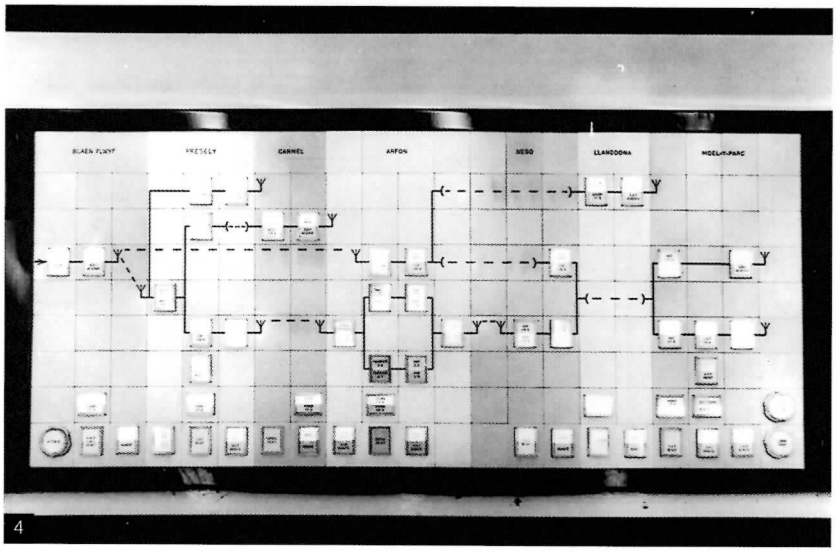
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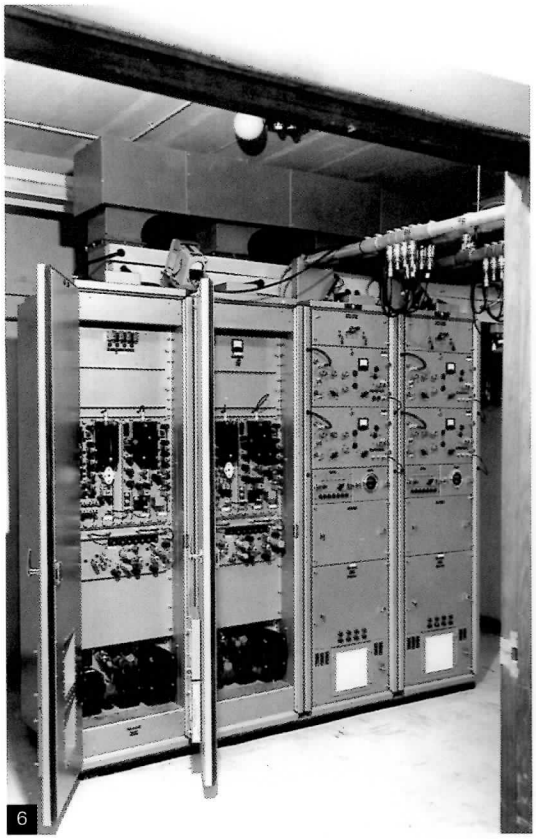
With the introduction of the 625 line UHF service changes to the 405 network were inevitable. In 1973 the GPO link to Preseli was replaced by an off-air pickup from the new UHF transmitter at Blaen Plwyf near Aberystwyth. This necessitated the installation of a Pye 625 to 405 line standards converter at Preseli. At the same time Preseli lost its control room function which was taken over by Moel y Parc.

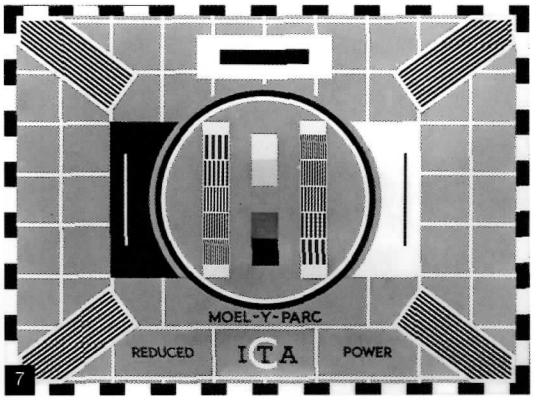
In 1978, a standards converter at Moel y Parc, working off the UHF transmitter feed, replaced the Nebo microwave link as the main feed to the 405 line transmitters. The Arfon route now became the standby programme feed. A year later a second standards converter was installed at Moel y Parc thus making the Nebo link redundant for programme purposes but it continued in use as a means of monitoring Arfon. It was finally decommissioned in 1981 leaving Arfon to run unmonitored until January 1984 when it was finally closed down. On 3rd of January 1985 Mr Pat Evans, a broadcast engineer at Moel y Parc, switched the 405 line transmitters off for the last time.

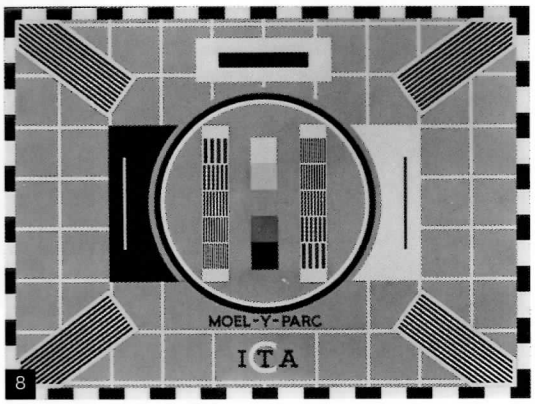
By the late 1960's the Moel y Parc engineering staff totalled a dozen engineers. At any one time two engineers were assigned to mobile maintenance duties covering scheduled and emergency maintenance of Arfon, Nebo and the Ffestiniog and Bala translators. The remaining engineering staff worked a two shift (day and evening, including weekends) system and were responsible for control room duties and base maintenance. Eight non-engineering staff were also employed at Moel y Parc i.e. clerk, electrician, aerial rigger, night watchman, two drivers, a weekday cook and a weekend cook. Similar staffing arrangements applied to Preseli and St.Hilary. Many of the IBA stations were real communities contributing not unsubstantially to the local economy. During those halcyon days station welfare committees organised dinner dances, staff outings and very popular Christmas parties for the

routed from Cardiff via a GPO microwave link to Preseli. Preseli's radiation pattern included a narrow beam across Cardigan Bay which together with a dual diversity reception system at Arfon, ensured a reliable signal for re-broadcasting. At Nebo on Anglesey (not to be confused with Nebo from where Moses viewed the promised land, or Nebo in Gwynedd where in fact Arfon is actually situated!), Arfon's signal was picked up on a BBC designed off-air receiver then beamed to Moel y Parc over the ITA owned Pye microwave link.

Moel y Parc, on Channel 11, was the last transmitter in the chain but there was one more link. The people of Bala had to wait that extra millionth of a second for their programmes from an STC translator situated near Llandderfel, one of the first solid state translators used by the ITA.







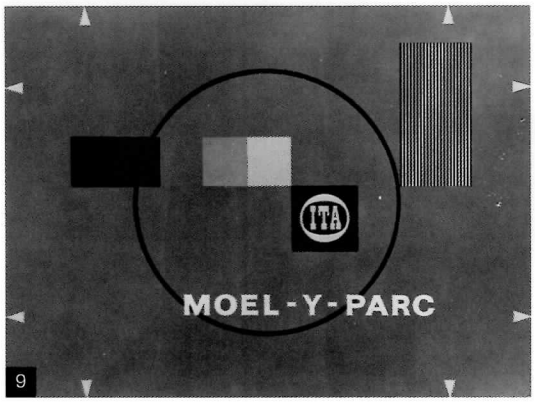
children of staff.

Moel y Parc's importance as a control centre and maintenance base increased with the build up of the new 625 line UHF colour television network. Maintenance responsibilities covered the whole of north Wales down to Machynlleth in the west and Newtown in the east. West Wales maintenance continued to be covered by the Preseli team and south Wales by St. Hilary. As the network developed it became necessary to open a fourth maintenance base at Abergavenny.

Control and monitoring of the network was split between St. Hilary and Moel y Parc. Moel y Parc's area covered north, mid and west Wales down as far as Pembrokeshire. The control desk differed from the standard control desks in use at other stations in that it was dominated by a large mimic panel indicating the state of both the 625 and 405 networks controlled from Moel y Parc. The mimic panel could also be used for basic changeover functions, usually in an emergency, whilst most control functions would be carried out from the control panels for each station housed in three 19 inch racks. Reorganisation of the ITV network in 1982 resulted in the closure of most of the IBA control rooms. These were replaced by four regional operations centres or ROC's at Black Hill in Scotland, Emily Moor near Huddersfield, Croydon in London and St. Hilary in Wales.

In order to provide UHF coverage for the whole of Wales it was necessary to build six main transmitters at Wenvoe, Carmel, Preseli, Blaen Blwyf, Llanddona and Moel y Parc plus dozens of relay stations. Again, Moel y Parc was at the end of the chain. At first, the programme route from Cardiff was via a GPO microwave link to Blaen Plwyf then an off-air pickup at Arfon followed by an SHF link via Nebo into Moel y Parc. This link proved unreliable and costly to maintain and in 1983 it was replaced by a mid-Wales link from Blaen Plwyfvia Long Mountain near Welshpool and Cyrn y Brain on the Horseshoe Pass.

There was one more piece needed to complete the Wales television jigsaw and that was the fourth channel. Throughout the 1970's a sustained campaign



took place for the establishment of a Welsh language television channel. At first there was little support from politicians nor indeed from most people in Wales but eventually an all-party consensus developed with all political parties promising the establishment of a Welsh language channel in their 1979 election manifestos. The new government under Mrs Thatcher broke this promise when the then Home Secretary, Willie Whitelaw, announced that there would be no Welsh channel. This u-turn caused so much outrage that Mrs Thatcher had to turn again and the Welsh fourth channel known as S4C or Sianel Pedwar Cymru commenced operations in November 1982. The new company was set up to commission Welsh language programmes from BBC Wales, HTV and an embryonic Welsh independent television production sector. The IBA had the task of installing the new transmitters and transposers alongside the existing equipment. This installation process took over ten years to complete.

The Welsh Fourth Channel is heavily subsidised and sometimes described as the world's most expensive television service. Whether this is true or not remains to be proved but critics forget that one of the reasons it was set up in the first place was to bring social cohesion to a linguistically divided Wales. It undoubtedly did this and also created hundreds of

6: Moel y Parc transmitter remote control cubicle and Pye caption scanner.

7: 'Reduced Power' Test Card C

8: Test Card C

9: Moel y Parc Tuning caption transmitted during opening routine before start of programmes.

10: UHF control desk (circa 1975)

11: VHF control desk (circa 1963)

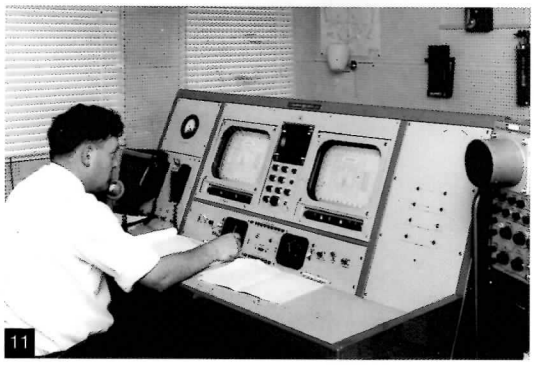
Photographs 2, 5, 6 and 11 The Marconi Company Ltd (1963)

Photographs 1, 3, 4, 7, 8, 9 and 10 David Jones

skilled jobs, not just in Cardiff but in rural areas such as Gwynedd. The Welsh animation industry was born with the advent of S4C and is now considered to be amongst the best in the world. The channel has given Wales a high international profile by winning awards at premiere European film and television festivals and on two occasions S4C commissioned films have been nominated for Hollywood Oscars. It is impossible to put a price on these spin offs but when taken into account it is difficult to sustain the argument that it is the world's most expensive service.

This article has briefly touched on the development of and some of the changes to the Welsh television networks. There will be more developments in the future, for example a single ITV company for the whole of the UK looks likely and this will have implications for the current ITV regional structure. Will terrestrial & broadcasting survive along side digital satellite and cable television in the global market? Time will tell...

10



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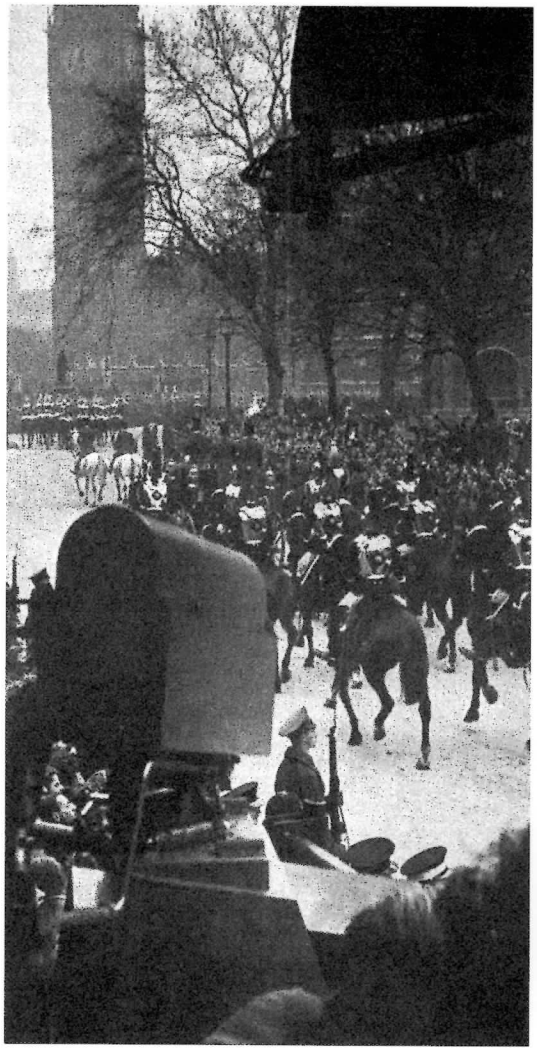
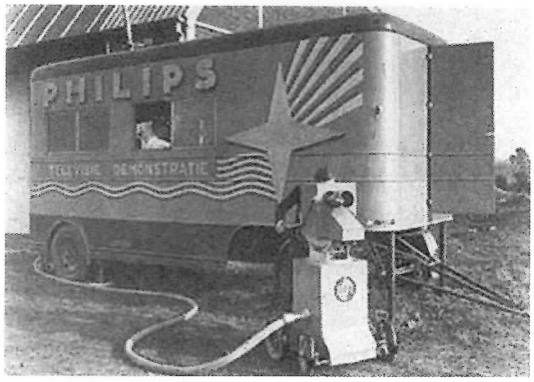
Dicky Howett writes...



Left: Here's a novelty. The occasion is the wedding in 1947 of Princess Elizabeth. That strange curved electronic box on view is a prototype CPS Emitron orthicon single-lensed camera. It was on its second outing, the first being a live relay of steam radio's ITMA from Broadcasting House. (The ITMA scripts were printed especially on yellow paper to help with contrasts and prevent glare). The royal wedding picture shows that the poor old cameraman has no proper viewfinder, (as usual). He had to make do with peering down at a monitor (not shown here). The very gloomy weather was ideal for the CPS image tube. What had to be avoided at all costs was stray spectral highlights from the sun which, as we all know, made the CPS image tube 'peel' all over the place. Nasty!



Above: I spotted this on the web. He writes, "Just to prove that not only BBC television was doing outside broadcasts in the mid-1930s, here we see a jolly Philips mobile tv wagon with its Iconoscope camera out on location somewhere in Holland. Observe the startling scanner decor and just look at that polypole cable snaking monstrously from the 'moderne' dolly. Trunks and pachyderms spring to mind as like as not."

Ferranti M55 by Paul Stenning

This set was offered at the NVCF in Birmingham a few years ago for £10. By the end of the day it had not sold so I offered £5 for it, which was accepted. The reason a set of this type sold so cheaply is evident; in the photo: the cabinet is badly cracked on one side. There are also stress cracks on the top, probably caused by heat.

Many collectors would write off a set in this condition. No dealer would consider repairing it because the cost of repairs would exceed the price the set would fetch when done. As far as I am concerned however, the repair and restoration is a labour of love - financial considerations do not come into the equation. Although the set will never be in as-new condition, and the repairs will probably be visible, I think the set is too attractive and distinctive to scrap. And anyway, one of these sets in excellent condition would probably cost more than I am prepared to pay (I rarely pay more than £20 for a set).

The set receives MW and LW, and was probably made in the mid-1950s. It uses the 8-pin U40 series valves (UCH42, UF41, UBC41, UL41 and UY41). I had previously removed the UL41 for possible use in another set, but found it was faulty when tested. This was no surprise - no one would intentionally sell a set with a good UL41 for a fiver!

Disassembly

Due to the nature of the damage I decided to deal with the cabinet first - so if this were not successful I would not have wasted any time and effort on the chassis.

For a change, this set had all the original screws securing the back! The knobs are just pushed on to metal shafts - not a good way of doing things on AC/DC sets. After removing the two internal screws securing the chassis, it still wouldn't come out. The speaker is mounted on the chassis, and is also screwed to the cabinet. Once these screws were removed the chassis and speaker lifted out as an assembly.

As I was placing the chassis on the bench, a screw and washer dropped out. These had previously been securing the tuning capacitor, and I was surprised to find that the other two screws were also loose. The only reason these hadn't fallen out was because some components were in the way. I refitted the screws before putting the chassis to one side.

I did notice that the chassis appears to be plated, and is still in very good condition. There were some sad looking wax-paper capacitors that would need changing, but I couldn't see anything else amiss.

Cabinet

The tuning scale is supposed to be glued into the cabinet, but mine was loose. With this removed it was time to clean and attempt to repair the cabinet. I noticed some wax dribbles on the base of the cabinet, confirming the unhealthy state of the wax-paper capacitors.

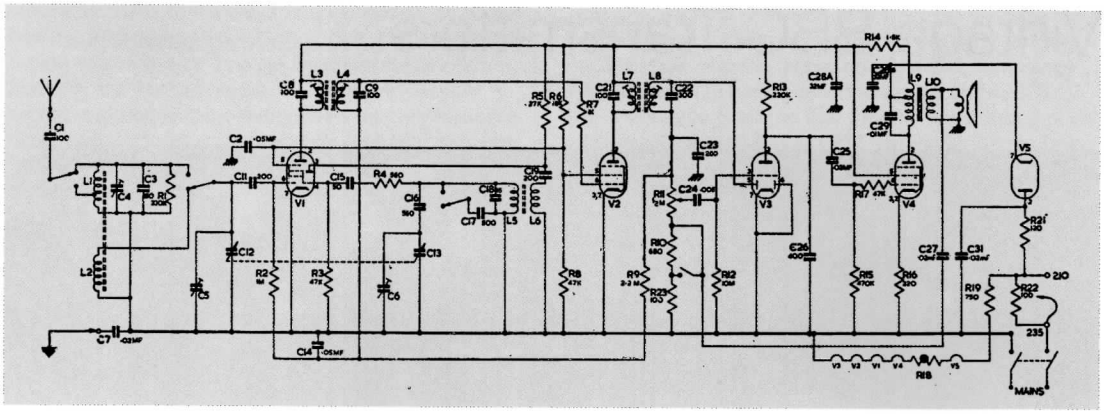
Before attempting a repair, I cleaned the cabinet carefully with foam cleaner. To remove the wax I found that WD40 was the most effective.

Upon closer inspection, I found that the cabinet is made from a slightly translucent material. When the cracks are closed it appears as a dark line, even when the mating surfaces are clean. I assume this is due to the light being able to pass part way into the material and the cracked or broken edges casting a shadow. It was therefore clear that whatever repair I attempted would be visible - which wasn't really a surprise!

I positioned the broken sections together dry, and secured them with masking tape. I also stretched a couple of bands of insulating tape around the cabinet; this is fairly stretchy and gives enough tension to hold the broken sections tightly together. On the inside of the cabinet, I applied superglue along the length of the joints. This is easier and more controllable using the version that comes with a small applicator brush. The glue can be seen to draw into the joints, so further glue was applied. This was repeated three or four times until the joints were full. The cabinet was then left to dry for an hour before the tape was removed. It was then left until the following day to allow the glue to dry fully.

Although the superglue bonds should be fairly strong, I decided to apply further strengthening to the inside. The areas around the bonds on the inside of the cabinet were carefully roughened slightly with fine wet-and-dry paper. The area was then coated with a layer of Araldite and allowed to dry for a further 24 hours.

So the result is a cabinet that is secure, but the damage is as visible as it ever was! I considered spray-painting it, but decided that this would spoil the original appearance of the rest of the cabinet. The damage is on one side near the bottom, and is not that visible with the set on a shelf with other sets either side, so I decided to leave it as it is.



Chassis

Before doing anything else, I replaced the six wax-paper capacitors in the set. One is connected across the mains (after the rectifier surge-limiting resistor) so was replaced with a Class X2 suppression capacitor. Another was connected across the output transformer primary - this was replaced with a 600V component. Since it is visible on the top of the chassis I used a vintage grey RS type. The others were replaced with modern 400V components.

I then replaced the mains flex with a modern type. The on-off switch felt a bit sluggish, and a check with a meter showed it was not closing. A shot of contact cleaner got it working. I also applied some to the waveband switch and the volume pot.

I removed the remaining valves and tested them with my valve tester. The UBC41 had some grid leakage (within limits) and low emission on the triode and both diodes. Rather than throwing it away, I put it to one side to try in the set later. The other valves were OK, so were refitted together with good UBC41 and UL41 valves.

A meter check across the mains lead showed open-circuit. After a few further checks this was traced to the dropper resistor. However the resistor itself was OK, the problem was that two wires appeared never to have been soldered. I think it is more likely that the joints were originally soldered but had suffered from heat, but whatever the cause, the solution was obvious - resolder them!

I checked the main smoothing capacitor with my capacitor reformer - it was fine. The coils on the ferrite rod aerial were loose, so they were fixed back into position using the wax, removed from one of the faulty capacitors. The original positions were evident from the remains of the sealing paint applied during manufacture.

Time for a test - and it worked OK. The only minor problem noted was a slight rattle from the speaker. I then tried the set with the original UBC41 - no difference.

I had an old UL41, which was very low emission according to the valve tester. I had tried it in a couple of other sets previously, but it did not perform very well. I tried it in this set and it worked fine, so I left it fitted. It will obviously need replacing eventually, but since the set doesn't get used heavily it'll do for now. It seems that this set is more tolerant of ageing valves than most.

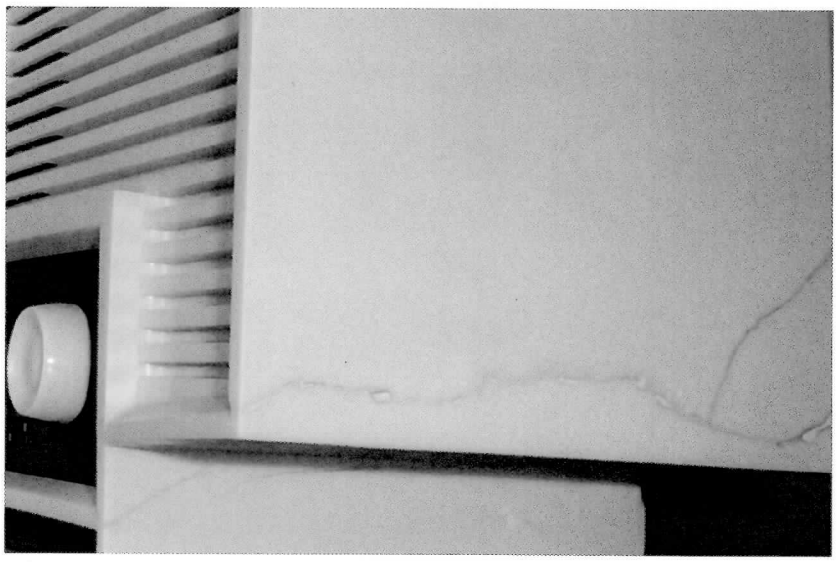
The cone of the speaker was coming away from the frame in a couple of places, as was the coil support behind the cone. I refixed both of these with EvoStick glue, but the speaker still rattled slightly at higher volumes. This could be completely solved by applying slight pressure to the rear of the cone in one area. It seemed that the cone was slightly distorted, but I could not think of an easy way to solve this. I therefore fixed it with a bit of a bodge - I inserted a rolled up lump of tissue paper between the cone and the frame, to apply the required pressure to the cone. To prevent it from falling out, I fixed it to the frame with some EvoStick

Reassembly

After the chassis had been running for a couple of hours, I was happy that all was well, so it was time to reassemble everything.

The tuning scale was secured back into the cabinet with some EvoStick, before the chassis was slotted back into place. The set was tested again at this stage, in case the screws fixing the speaker to the cabinet had applied any twisting to the speaker frame and affected my 'bodge', but all was well.

I finished reassembly, including the knobs and back, then gave the set another test run for a couple of hours. While it was playing I removed a couple of sticky patches from the cabinet (due to the adhesive tape I had used to hold it together while repairing it), then polished it with some spray household polish.



Final comments

This was not one of my most successful restorations - especially the cabinet repair - but I feel it was the best I could do under the circumstances. I could have painted the cabinet, but this would have lost the original appearance and resulted in a rather flat look to the set.

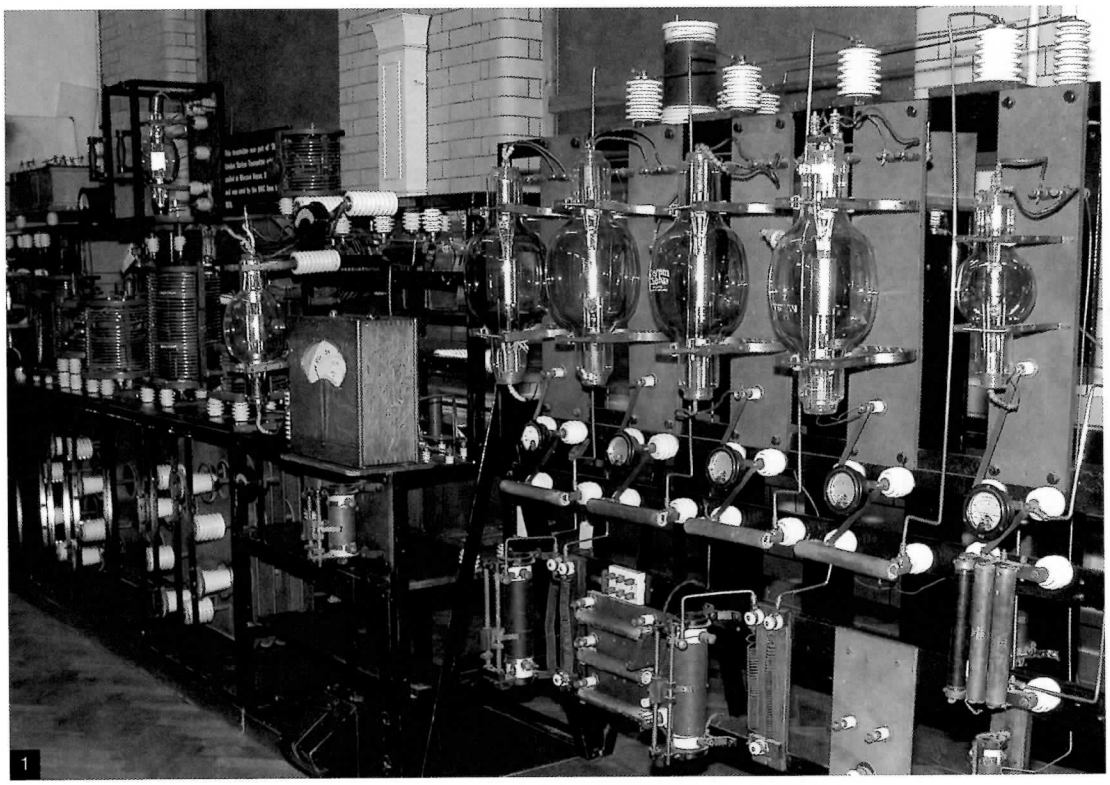
I could also have located and fitted a replacement speaker, but it may have been difficult to find one the correct size. The original works fine with my 'repair', so it is good enough for this set. If the set had had an undamaged cabinet I would have gone to more effort to find a speaker. A set like this will never be worth much - not that I am planning to sell it!

Despite the visible damage to the side, the set looks good on display surrounded by other radios, and it also sounds good when it has its opportunities to play.

www.vintage-radio.com

Vintage BBC Transmitters

By Norman Shacklady and Martin Ellen



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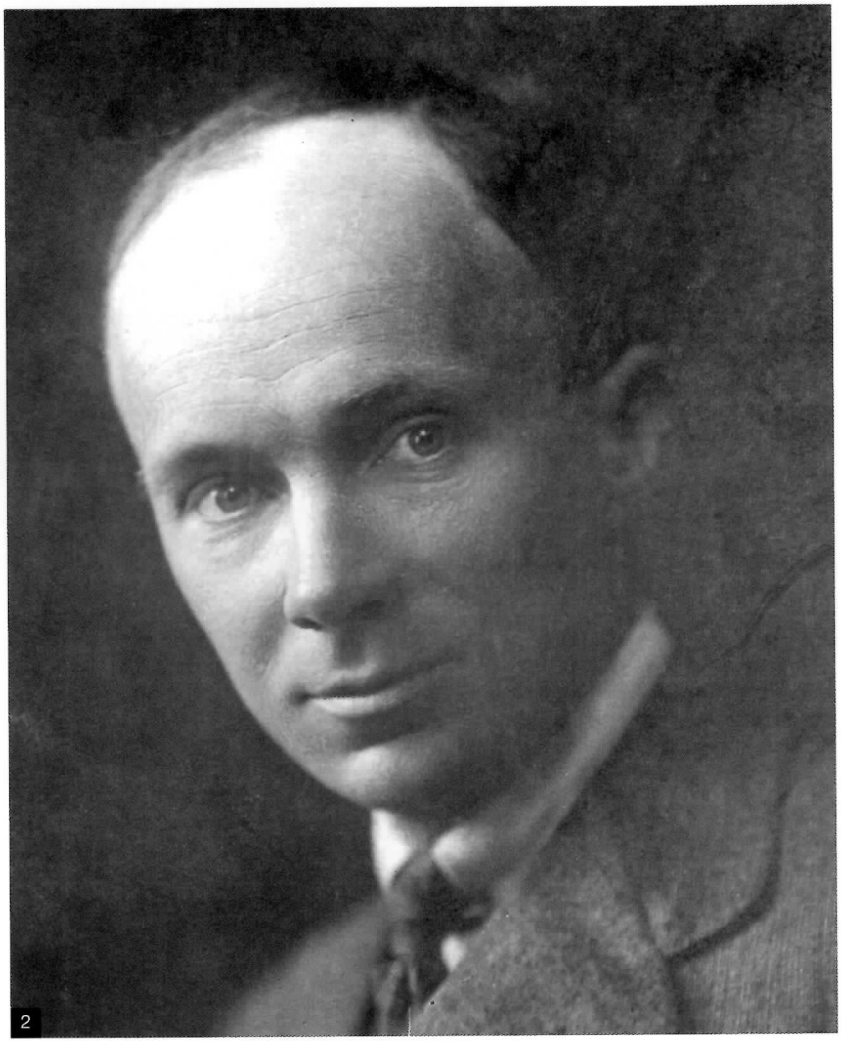
The BBC's first Radio Transmitter

It is 74 years since the callsign 2LO was in use by the BBC, but even now it is still recognised by many members of the general public and not just vintage wireless enthusiasts. Usually people associate it with early wireless receivers and the BBC's first programmes, but the key technology that created the magic of these radiowaves was the transmitter. Actually, three transmitters were assigned the callsign 2LO. The first one only produced 100W and it started transmitting from Marconi House in the Strand, London on 11 May 1922. Its design was fairly similar to the 250W transmitter at the famous hut in Writtle with the callsign 2MT.

Pressure for broadcasting continued to mount during 1922 and by the time that the newly formed British Broadcasting Company used 2LO for its first broadcast on 14 November 1922, a considerably more advanced 1½kW transmitter had been designed and installed. It is said that H.J.Round designed the transmitter and C.S.Franklin made it work, because initially eddy currents in the metal panelling caused a problem. However this comment tends to convey the wrong impression about Henry Joseph Round because his lifelong contribution to the engineering profession was staggering. He joined the Marconi Company in 1902 and within a few years became one of Guglielmo Marconi's elite band of top engineers. His achievements would merit a whole series of articles because:

•He pioneered the use of valves for high power wireless telegraphy and telephony transmission.
•He was awarded the Military Cross as a result of developing and overseeing the radio direction finding system that detected the German High Seas fleet breaking out into the North Sea. This led to the biggest naval battle in World War I. The outcome of the Battle of Jutland was indecisive, with both sides claiming victory, but the course of world events might have been



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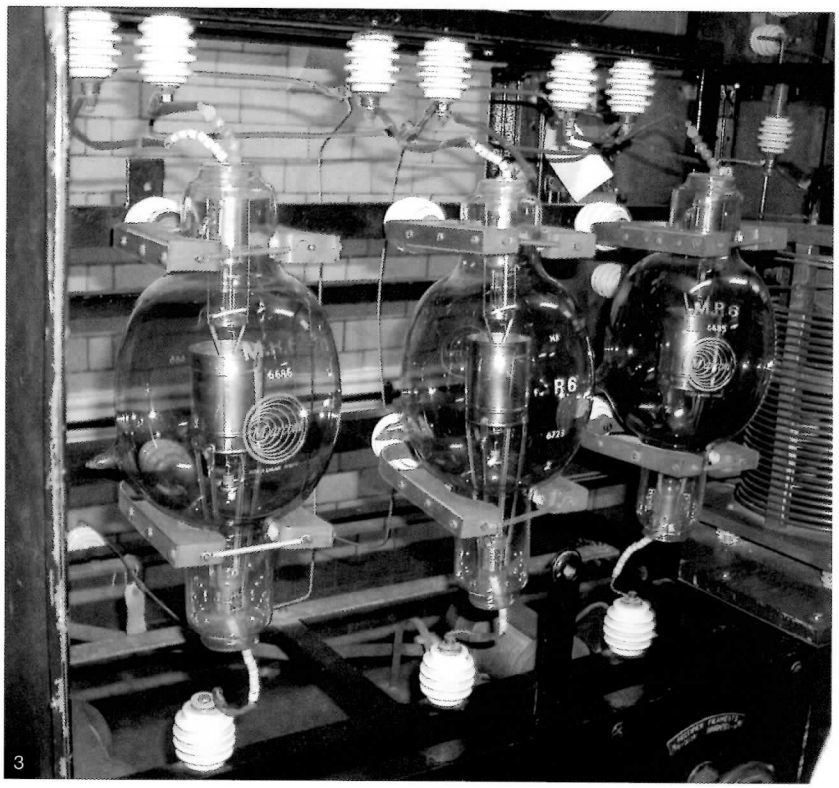
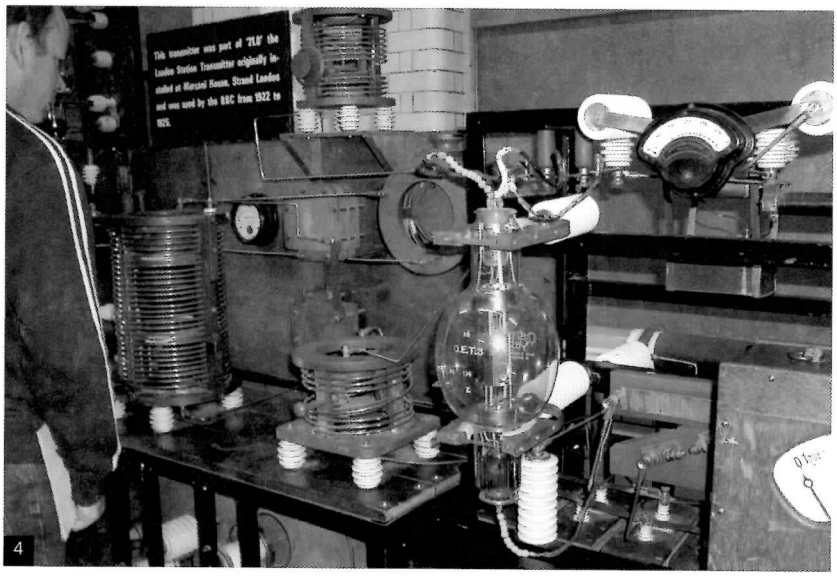




1: 2LO Transmitter at Blythe House, Olympia.

2: Captain Round

3: EHT Rectifiers.

4: Modulated Amplifier

5: Master Oscillator

very different if the German fleet had proceeded undetected and unopposed.

•He played a leading role in Marconi's early test broadcasts and he even persuaded Dame Nellie Melba to prolong her famous recital on 15 June 1920, after her broadcast was interrupted by a valve failure on the high power transmitter in Chelmsford (callsign MZX).

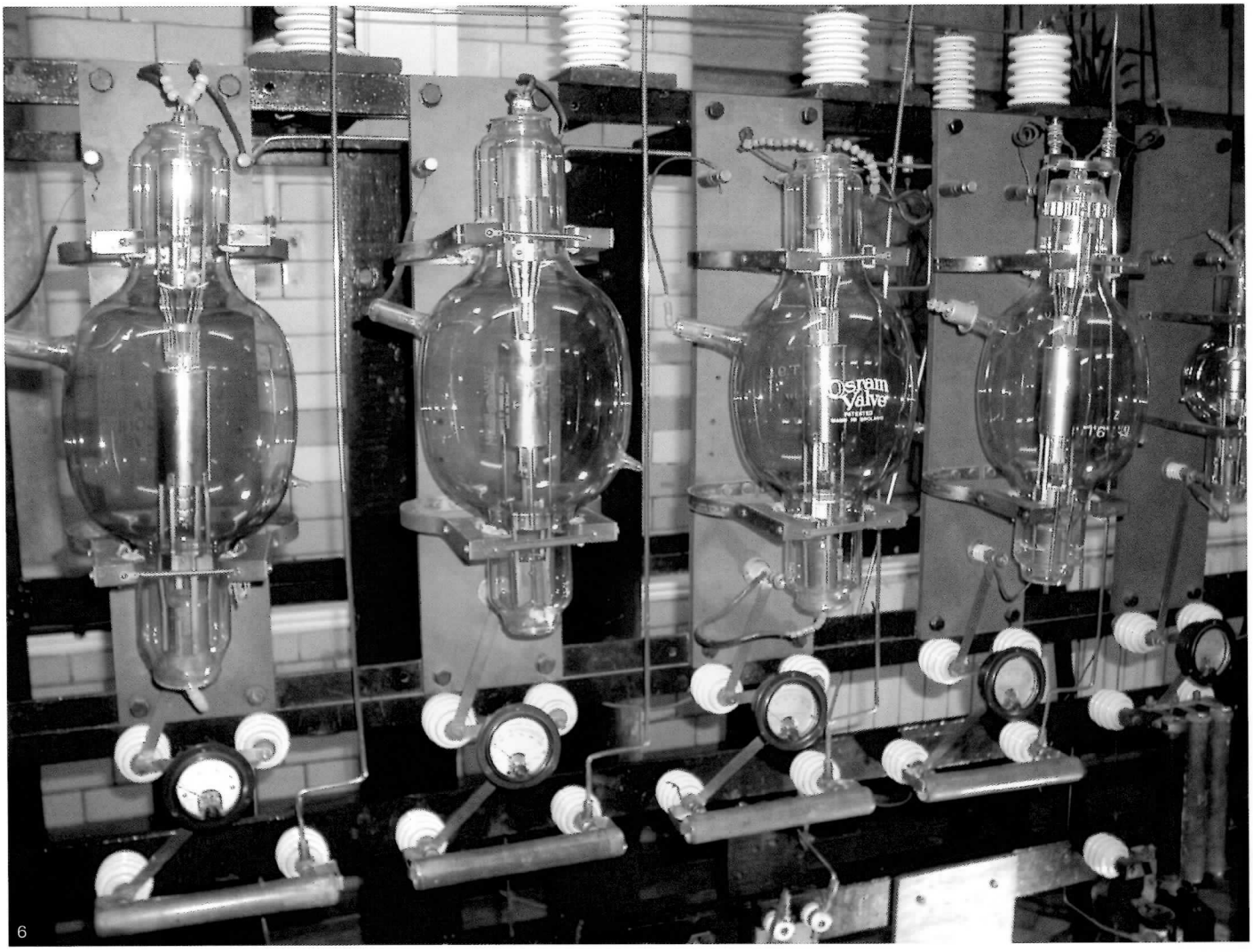
•He continued with pioneering work on gramophone recording systems, cinema sound systems, echo sounders in WWII and many other things. He averaged about one patent every 6 months until registering his last one at the age of 83!

So, the 2LO transmitter was the product of a great engineer working for a great company and it was the key technology which enabled that great organisation the BBC to start broadcasting. It is fitting therefore that the transmitter is now being preserved by the Science Museum in London, after being donated by the joint owners: Crown Castle UK and the BBC. The Science Museum held a celebration to mark this event on 14 November 2002, the BBC's 80th birthday.

The transmitter was in service for the BBC from November 1922 until April 1925, at which point a replacement transmitter of nearly twice the power but still with the callsign 2LO took over at the Selfridges building in London's Oxford Street. This transmitter closed down in October 1929 when the new high power MF station opened at Brookmans Park about 15 miles north of London.

Some 25 years later while a senior BBC manager was visiting Brookmans Park he noticed a pile of old transmitter parts in a storeroom and when told that they were from 2LO he immediately recognised their importance to the Nation's broadcasting heritage and ordered the reconstruction of the transmitter. This involved a lot of detective work by the operational engineers based at Brookmans Park who carried out the work and they had to manufacture some of the missing parts or acquire them from elsewhere. It was not feasible to restore the transmitter to full working order due to the high power involved and restrictions caused by safety requirements, but most of the components were mounted in their original positions and connected together. The circuit shown with this article was re-drawn in 1972.

Since being re-built in the 1950's 2LO has appeared in a few exhibitions and further restoration work was done in the 1970's prior to filming for a television programme, that unfortunately does not appear to have been broadcast. It was nearly consigned to the scrap heap in the 1980's, but fortunately it remained in storage at Brookmans Park and then Daventry. Unfortunately like most of the Science Museum's objects, it is not yet on general display to the public but it is being kept safely at the museum's store in



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Blythe House near Olympia in London. Hopefully it will be on display in due course.

2LO was used for some of Mr Baird's early television tests, but he used the final transmitter installed in the Selfridges building. This was a double Marconi "Q Type" that was heavily based on the 2LO transmitter discussed above. Further television tests made use of the Brookmans Park transmitters that replaced 2LO, but the BBC's first purpose–designed television transmitter was installed at Alexandra Palace in 1936.

The BBC's first Television Transmitter

Alexandra Palace was unique in its day and although television had been transmitted many times before in various forms, the signals sent out in 1936 from those now familiar aerials were quite new and exciting. The high definition programmes were to herald a new era in broadcasting.

So far as the vision transmitter was concerned, it needed to cope with this new technology, and it was the combined efforts of Marconi and EMI that produced a remarkable design. Marconi were responsible for the rf sections and EMI the modulator. A high power transmitter at 45 MHz with a bandwidth of some 3 MHz was edge of technology in the 1930's, and it was to their great credit that the equipment was still in service in 1956. It had a rated peak white output power of 17kW (positive modulation) and the aerial system produced an effective radiated power of 34 kW; this was the maximum erp allowed at the time. The Carrier frequency of 45 MHz was derived from a 22.5 MHz drive unit which fed a doubler in the transmitter. Six rf amplifier stages followed with the final stage being grid modulated. The modulator comprised four stages of amplification and included a system of DC restoration. An interesting feature of this was that it included a dry battery as one of its reference potentials. This was no less than a standard 120v tapped battery of the type used in domestic radio receivers of the period! It did however provide an extremely effective dc clamp. Marconi also provided the 3 kW sound transmitter and the station employed separate sound and vision aerials.

A newcomer to the station would immediately recognise the familiar style of a Marconi HF transmitter, complete with the standard control desk of the period, but there of course the similarity ended. However, like the HF stations of the day the vision and sound transmitters employed rotating machines to provide filament, bias and the various HT supplies. At purpose-built stations the machinery was always installed in a dedicated area away from the transmitters, in order to divorce them from the inevitable noise, but Alexandra Palace was somewhat different. The building had not been designed with the idea of housing a transmitting station, and the accommodation consisted mainly of a number of very large rooms, one of which housed the vision transmitter, machinery and all. (The sound transmitter was located in another room.) One sat at the control desk, facing the transmitter at one end of the room, and behind were the lines of motor generators. In addition, the main EHT was produced from a 50kW 500Hz motor alternator which screamed away at the other end of the room, supplying a mercury arc rectifier. The overall noise was pretty high and made such things as monitoring the sound programme or

6: Modulator.

7: 2LO circuit.

answering the telephone almost impossible. There was an oscilloscope which displayed the sound carrier so at least one could tell if modulation was present! As for answering the telephone an acoustic hood was provided but was of little help.

The effective range covered approximately 25% of the UK population, and was much greater than had been expected. In the beginning of course there were very few television receivers, but by 1939 when the service was closed down at the onset of world war II, there were some 23,000 sets in use by the public.

During the war both the sound and the vision transmitters were either made ready or used in anger against the Germans. In the early stages, when the threat of invasion was at its greatest, the vision transmitter was made ready to jam the communication links of German tank formations. On another occasion a similar scheme was prepared to interrupt German Paratrooper frequencies; fortunately neither of these arrangements had to be used. The sound transmitter was however used to confuse the German 'Y-Gerät' radio navigational system used by their bombers; a very effective system using a series of radio beams. This counter-measure, known by the code name 'Domino', was so completely successful that the German system was withdrawn. In 1944, misleading information about the guidance system used in the German V2 rockets resulted in plans being made to use Alexandra Palace and certain other transmitters to disrupt the system. On the information then available it was believed that the rockets were guided by a radio system capable of being jammed. Before the plans could be put into operation the true details became known and it was clear that jamming in this way was not feasible, and the idea was abandoned.

With the end of the war, it was decided to re-open the television service using the original Alexandra Palace transmitters. The modifications for war-time use were removed and considerable work was necessary to reinstate the equipment. New aerials were erected and the system was ready by early 1946. Following a period of test transmissions for the benefit of dealers, the service was formerly opened by the Postmaster General on the 7 June 1946. Alexandra Palace continued in service until 1956 when the new station that had been built at the Crystal Palace site was brought into operation.

The close down of the final transmission from Alexandra Palace on the evening of 27 March 1956, was quite unusual and certainly unique. The television news studios were located on the floor above, and it was decided to bring down a camera and radiate a picture of the control desk and vision transmitter, with the duty engineer running down the main HT - quite dramatic. A fitting end to a very historic transmitter.

The story continues

The 2LO and Alexandra Palace transmitters enabled the BBC to start broadcasting radio and television programmes, but of course they were only the start and further vintage technology marked the development of numerous services which built upon their foundation. Shortwave broadcasting in the UK and overseas, VHF/FM radio, UHF colour TV and data services were all delivered to more and more people in ways that became more and more efficient. The human and technical story behind these achievements is told in a new book called On Air – A History of BBC Transmission and details can be found at www.onairbook.co.uk

Acknowledgements and references

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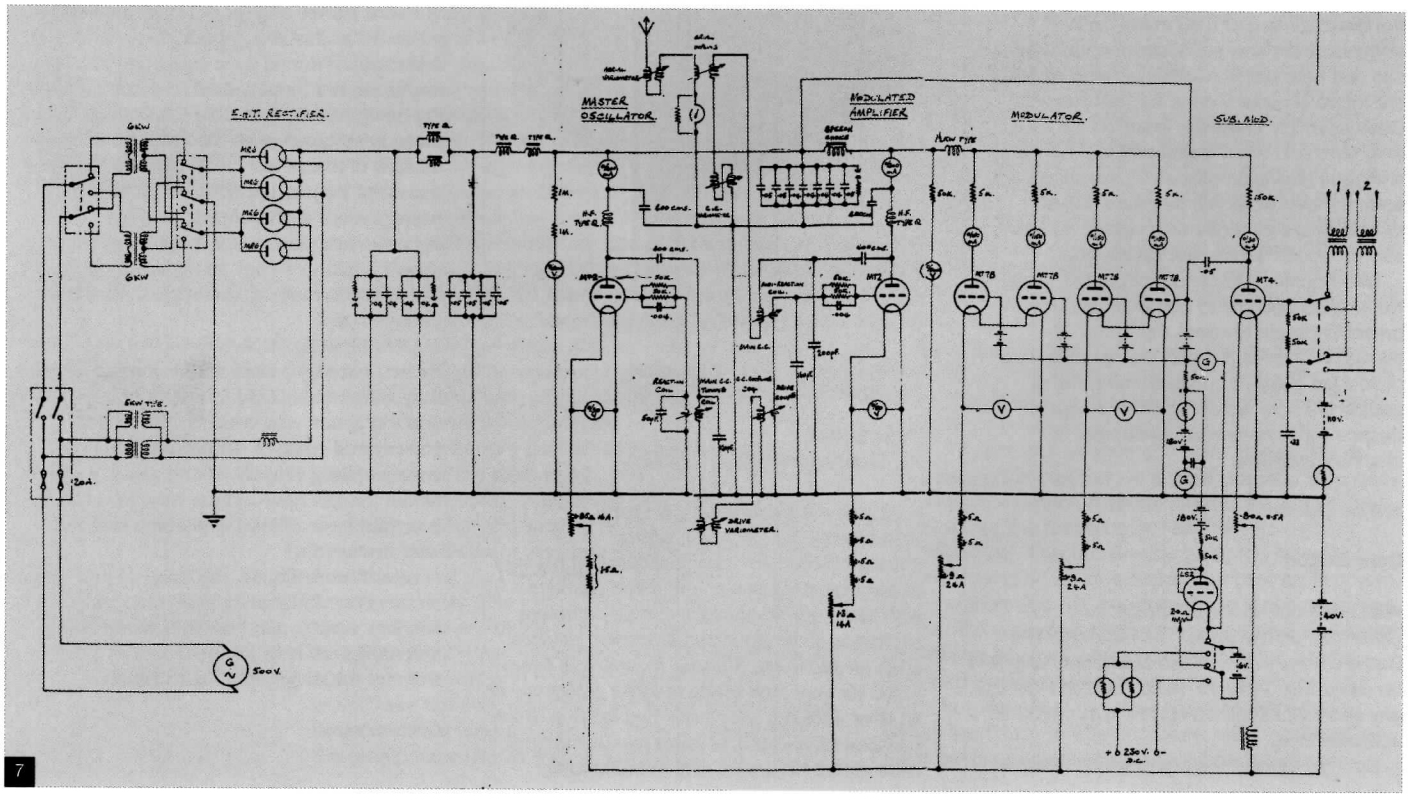
BBC Engineering 1922-1972 by Edward Pawley, published by the BBC, ISBN 0 563 12127 0

Photographs: Graham Phillips www.radiodates.co.uk

Website on H.J.Round: www.captainround.pwp.blueyonder.co.uk

Website on Marconi: www.marconicalling.com

Website on 2LO at the Science Museum: www.sciencemuseum.org.uk/exhibitions/2lo/



7

Letters

Dear Editor,

Buying valves at the NVCF

In my experience, unless down in the £1 a time bargain basement, or buying from one of the established dealers, don't bother.

At the May event, I bought a very clean PM24M, without a box, for £7. It had a label saying "New" and "Good. The vendor assured me that it was. In fact it turns out to have only 50% emission.

This is not the first time that this has happened. I hope I have learned my lesson and won't be tempted by these 'bargains' again. Unlike Harpenden, many of these vendors are faces never likely to be seen again.

Gary Tempest

Dear Editor,

Andrew Henderson's article on the current practice of producing most programming in 16:9 format is absolutely right in that existing 4:3 material is distorted to fit the new size. The 16:9 format seems to have been invented by set manufacturers keen to create a new demand for receivers, in much the same way as mobile phone operators keep pushing unwanted facilities on new phones to try and stimulate a demand.

This con trick is depriving most viewers of vertical resolution, since apart from aspect ratio distortion when sqeezing 4:3 to fit, existing sets display black bars at the top and bottom of the screen. What ever happened to high definition television ? The answer of course is that the digital revolution has deprived us of the bandwidth needed to do justice to this exciting medium. Since engineers no longer seem to have any say in the development of their ideas, and administrators and politicians decide what we see and hear using electromagnetic radiation, the future is bleak indeed for this medium. Does anybody know the intention for 16:9 long term and will it totally replace 4:3 when analogue television ceases ? One thing I am sure; the decisions will be made behind locked doors by those with vested interests, and no public debate will be allowed.

Like Andrew, I hope lots of people will write to the BBC and ITV to complain about the present attitude towards the future of television and maybe add that quantity has destroyed quality in programming. Most people are now watching less television despite the ever increasing number of channels available.

Graham Dawson

Dear Editor,

With reference to the article by Tony Constable on my book 'The History of the Radio Officer in the British Merchant Navy and on Deep Sea Trawlers' (Alas I couldn't get it any shorter!) I think his review was most fair and balanced.

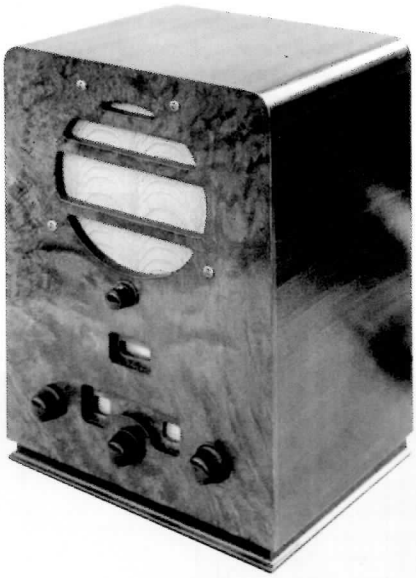
But may I make the point, which I believe is important, that I wrote the book with the aim of interesting the widest possible public in the now past world of the MN Radio Officer. While I hoped, as indeed has turned out to be the case, it would be appreciated by many ex Radio Officers, that was not the main intention. And I have been particularly gratified by the large numbers of letters, emails and telephone contacts that have flowed from it from ex-members of the other departments on board ship.

If anyone else can throw light on any of the more famous episodes I have described I would be grateful. It could be included, with due acknowledgement in a future reprint which is looming ahead.

Yours Sincerely,
Joanna Greenlaw

Dear Editor,

Gary Tempest's account of the dedicated restoration carried out on his Ferranti Arcadia in the Winter issue brings home to me how happy he must have felt at the end of such a challenging job. Such joy must have been felt in Arcady, to which he refers in his final paragraph but I think he is a bit adrift in placing the musical 'The Arcadians' in the 1930s. While it certainly would have been in revival at this date and later. The show was



first staged in London as long ago as 1908. Would that Gary could hear some of its songs eg 'Arcady is ever young' via his Ferranti Arcadia – stranger things have happened.

Yours Sincerely,
Terry Bennett

Dear Editor,
Re: Disintegrating foam plastic

A propos the experiences of Harry Woodhouse (Vol. 27 No.4) with a disintegrating foam cone surround on his very expensive loudspeaker, the same problem with foam plastic appears in many different situations. Even precision electronic devices such as Japanese Kokusai mechanical filters (used for very high grade receiver selectivity at an IF of 455kHz) will sometimes fail due to the collapse of the internal foam plastic material. I believe that Kokusai's rival manufacturer, Collins did not use plastic foam in their mechanical filters.

PVC itself is another candidate for chemical decomposition. In the museum and conservation worlds, PVC is considered very bad news for the storage of natural products such as leather goods or uniforms. This is partly because the PVC inhibits the flow of air, causing damage to the stored item and partly because the material itself disintegrates with time. The current wisdom is to use old-fashioned muslin bags.

Yours Sincerley,
Michael O'Brien

Dear Editor,

Archiving Old TV Material.

I was very interested in the recent article by Andrew Henderson on early TV programming and lost material. As somebody involved with copying a lot of early videotapes for both ITV companies and the BFI, I would estimate the number of surviving 405 2" videotapes as under 1000, not including any tapes the BBC may still have stored away.

Most of these have now been copied to 625 Digi Beta tapes, through a digital converter from one of the few remaining 405 capable quad machines. In general the quality of the copies has not been noticeably different from the original 405 pictures, and in many cases the pictures and sound are excellent. Interestingly the tape oxide shedding and stiction faults found with many 1970s 625 and 525 tapes do not apply to the earlier batches of tape, which were of a different chemical formulation, and they have survived remarkably well. I have also never had a physical splice part during playback, even on tapes containing 100 edits, but edge damage can often lead to cutting a tape by the rotating heads.

The most common faults found with early taped programmes result from instability in the sync pulses and record machine servos, vision mixer flashing, tape surface scratching and dropout during sync pulse periods. Very few tapes are "unplayable", but some cause the converter more trouble than others. Since these early tapes were recorded on a varied mixture of machines, it can take some time to setup the playback machine to match the misalignment of the original. It is also necessary to playback in a tight servo lock to allow timing correction to minimise geometric distortion, something the original machines could not do.

Unfortunately most early videotapes were thrown out at the start of 625 line colour, as they were not suitable for high band recording and the space was needed in the library. The commercial value of old programmes was seen as being virtually nil and anyway where would the BFI have stored them all, even if they had been offered everything that was later thrown out?

Like other antiques, the value of that which remains has fortunately been recognised by a few key people, and hopefully these early recordings will now be preserved in a digital form for future generations to watch.

Graham Dawson.

Dear Editor,

Greetings from thundery "Wild Wales" (Oh! For an OT knife switch to earth the Aerials). Thanks are due (a) your good selves for your continuing expertise, (b) the foreman/Tech. Director (!) of the wee 2.4Ghz outfit near here, - for stretching my O.A.P by swapping "mags."

My rather long letter on TV bashing has met with open-mouthed approval (?) The only "moan" being of the area "wasted" by the photos, (a) not to do with thee lad, (b) made the print too small (this from my neo-octovarian senior "student" (c) ...? Nuff sed! As a thank-offering may I offer a few thoughts, inspired by your winter 02 journal, and "bro." Garnett's excellent treaty on early thermionic tubes.

At l-o-n-g last, the "powers that be" have given their official acknowledgement to an electric-current as being a flow of electrons! (In the "new" Intermediate/Foundation Amateur Licences)

So now (?) may be the time to "reveal" a "current" flowing in the "conventional" direction so resolutely adhered to by so many (for too long... like 70 yrs! Since the earliest textbook on electronics, that I've found, - Dr Gaunt's "Electronics" 1932).
For those "wrinklies" that went to decent schools in the pre-GCE (say half a century ago) and got taught properly in science or physics to matriculating level (I still treasure my "utility" WWII copy of Dr. Smith's "Intermediate Physics") – they may recall a glass-tube, two foot long, two inches in diameter with short platinum wires sealed in the ends (long before car's catalytic-converters made it a hazard!) A small tube would connect to a hand-cranked Vacuum pump, with a Mercury barometer to indicate the falling pressure as the muscular members of a class took turns at the pump! The wires would be ("curly") connected to the induction coil! Whose six-inch worth of electricity could be applied. All this in a "black-out" darkened laboratory! – One of the easier to attain environments during wartime. When the "plops" of the pump had got hardly audible, a glow would be produced in the "rarefied air, pale ghostly green, which, if the Rugger-"pack" were consistent with their cranking, - would (disappointingly) fade, but then re-appear as a pale-pink for most of the length, - but a "dark space" (Crooke's) separated it from a blue-glow near the end, - which could be "swapped" if the induced (very-high) voltage got reversed in polarity! (By double knife-switching the primary supply). A magnet would affect the display (showing the accepted "hand" rules) while an angled metal "target" (within the tube) would deflect the "beam" of "current" and produce a new form of energy, which penetrated the glass-tube, - and (my!) hand to show my (moving) hand-skeleton as shadows on a Zinc-blende screen. (Gulp! – soft un-focussed X-rays, for several minutes!) But there, - the lab. Had a bottle of Uranium salts, - which glowed in the dark, and the water supply came from racks including Strontium (90?) amid the predominant (Calcium) Limestone. – And my teeth glowed in UV street lights (a few years later). Note! No heated filament / Kathode, - pre thermionic, and a Dr. Brown developed his "Kathode-ray tube" to an useful investigative instrument (around 1870 odd!)

When electric lighting progressed to domestic scales, - "bulbs" (luminaires) used Carbon (coiled) or more expensively, Platinum or Tungsten (wolfram), as long (by today's coiled-coil standards) incandescent filaments. As development progressed (the candless- de Forest book gives an excellent account). The economics of exhaust pumping still limited the degree of vacuum to modest depressions, yet the light / life improved, and the sharpness of darkening on the inside of the glass bulbs (which gave sparkling spots in strong R.F. "fields", but that is "by the way").

Such degree of vacuum "guaranteed" the retention of the odd (Billion) atom! With plenty of "space" to float about, or whiz at a hot-spot or at a point of different electrical potential, also likely to "lose" a electron from the most "exposed" orbits around the nucleus (of Oxygen, Nitrogen, even Carbon, from CO^2) thus becoming an ion. (Eyeon!) With a "positive" (electron-deficient) electric charge, - all too eager to rush headlong towards a "pool" of negative charge (surplus of electrons, - from a battery or what have you.) Even the lightest atom is nearly two thousand times heavier than an electron! While "air-weight" Oxygen/Nitrogen is 16/14 times heavier still, giving quite a wallop to the source of electrons (quite a consideration in some applications!) Note this flow of current is in the "conventional" direction – but only inside the virtually evacuated space! With vast numbers of electrons going (much faster!) in the "electron-current" direction at the same time! No wonder "gas filled" valves ran hot! And needed time to start/warm up!
Even tiny valves (popular when 27Mc/s was "occupied" by RADAR and model-control enthusiasts) would become ionised, and pass enough current to "pull-in" the electro-magnetic relays / reed-units needed to control the models – ships/aircraft, - needing HT to be limited to 30 volts or so, just as the earliest Triodes "only" had a "score" (20!) of dry cells for HT (to keep below ionising voltages).
The wee Testoscope tubes, -just two wires (electrodes) in a low pressure gas, will "ignite" at 60volts, needing high value resistor to limit current (and prevent explosive disintegration!)

Yours Sincereley,
Wyn Mainwaring. I Eng, MIIE

Dear Editor,

I have recently joined the BVWS and would like to say how interesting and informative I have found the Bulletins. The letters concerning a museum in Sweden have prompted me to draw your attention to another one elsewhere.

If you are interested in the history of radio and on holiday in Verona a good way to spend an afternoon would be to visit The Museo della Radio d'Epoca. It is located in the Instituto Industriale Statale on the other side of the road leading to Juliet's tomb, a favourite site for tourists. This is what we would have called a Technical College so is only open during academic term times. Wander in and the attendant will direct you to a lecture room on the ground floor surrounded by glass cases full of radios, then you are directed downstairs lined with radios yet to be housed to a much larger hall again surrounded by yet more display cases. The displays in the lower lecture hall are shown on the website at:
http://www.museodellaradio.supereva.it/ilmuseo.htm?p which unfortunately is still apparently under construction.

It is free! well presented and enormous. Mainly Italian sets of course, but quite a few American, German and British radios. All descriptions are in Italian.

P.S: there is a picture of the leaflet at:
http://www.richardsradios.co.uk/Images/ducati.jpg

Yours Sincerely
Richard Allan

Dear Editor,

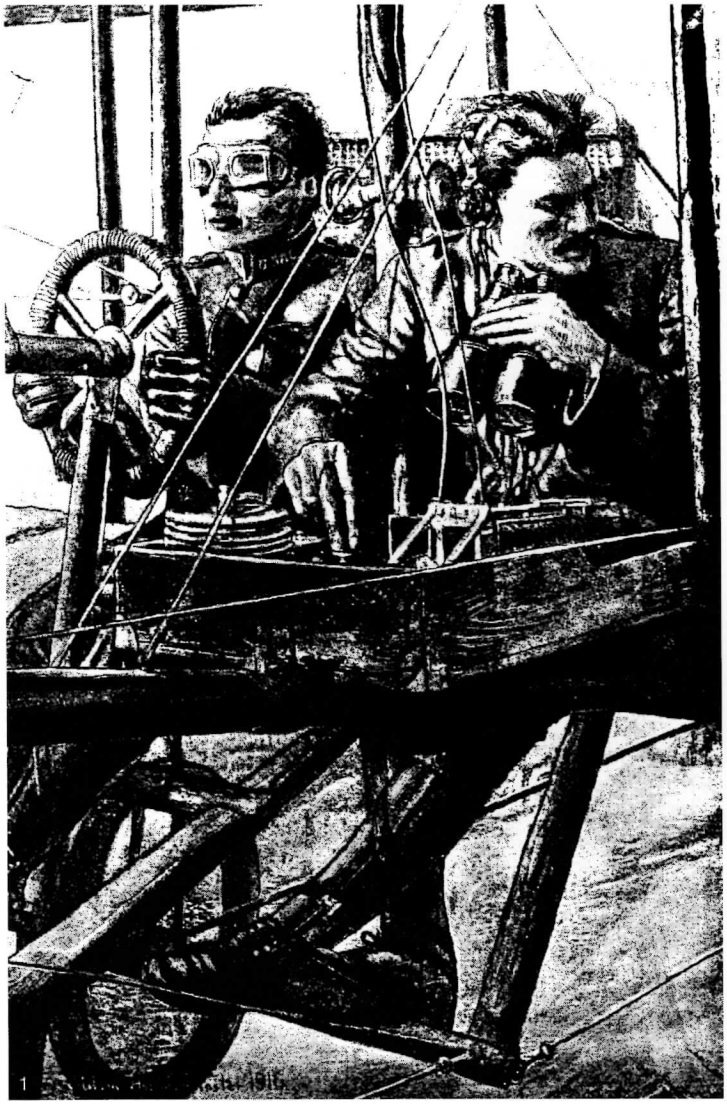
A warning about foam
Recently I opened a small transit case, one that I had not opened for some time, only to find a horrid sticky and corrosive mess instead of the nice soft foam lining. It seems that the foam sponge plastic material had under gone a transformation with the passage of time. The sponge foam is or was the dark grey lightweight sort a bit like to sort you sometimes see filling cushions. I have not had a problem (yet) with the dense hard foam you see in more professional packing and no doubt expensive use.

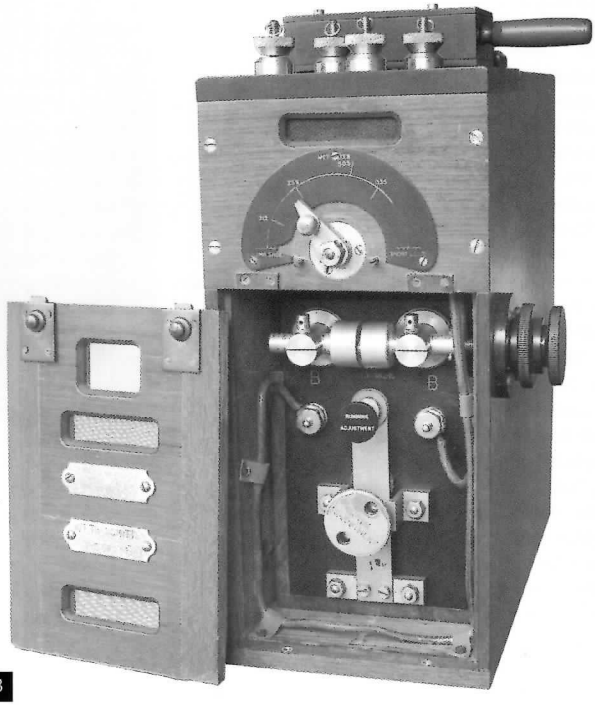
I have had this happen on a previous occasion and have now resolved to go through the various packing cases and boxes that I have squirreled things away in. If you have some of this foam packing I can really recommend that you inspect it regularly, the consequences as I have found out is a real tacky mess.

I wore disposable gloves to clear it up and wash the tools clean, fortunately the contents were only tools and not part of my camera collection, I hate to think what the corrosive effects would have been on a lens! The corrosion was obvious on the plated tool surfaces.

If you can't bring yourself to rip out, what seems to be perfectly good foam, at least wrap the content to protect them from the foam decay. The foam in question was probably 25 to 30 years old and I suspect there are a few more of these time bombs waiting to do their worst.

Brian Summers





1910 Aircraft Wireless

by Brian Slade

Within one year of the birth of the world's first aircraft factory, built at Leysdown, Isle of Sheppey, Kent, wireless had been installed in one of the aircraft. In 1908 CS Rolls tested a glider built by Oswald and Eustace Short. This glider was shared with Alec Ogilvie who owned a field at Leysdown.

His appetite wetted by his two brothers' glider experiment, in 1909 Horace Short travelled to France to observe the Wright brothers put their powered heavier-than-air flying machine through its paces at Pau. Greatly impressed by what he observed, Horace Short secured manufacturing rights to build Wright flying machines in England. Horace was amazed to discover that the Wright brothers had no construction diagrams of their aircraft with them. Undaunted, he simply stayed in France long enough to measure and sketch the Wright machine before returning to England, where contributing two hundred pounds each, in 1909 at Leysdown, Horace, Eustace and Oswald Short (Short Brothers) set up the world's first aircraft factory.

A few months later at Leysdown the factory was in full production manufacturing six flying machines for CS Rolls, Alec Ogilvie, Cecil Grace, Hon. Maurice Egerton and Frank McClean. The factory employed eighty and had the right to fly over the nearby marshland known as Shell Beach.

It was at Shell Beach, Leysdown, October 1909 that the history of British aviation had its beginnings, when for the first time a British flyer, JTC Moore–Brabazon, later Lord Brabazon, piloting a British-built, British-designed, British engined aeroplane, made a circular flight of one mile. He actually managed to fly two miles in two minutes, thirty six seconds at an altitude of between thirty to forty feet. The Wright Brothers inspected the factory's output in May 1909. In 1910 ground-to-air, air-to-ground and air-to-air wireless experiments were carried out for the army at Leysdown. It is remarkable that all this was accomplised within just a few months of Horace Short measuring and sketching the Wright flying machine in France. Quick work by any standard. Everything that took to the air from the Leysdown aircraft factory in those early days was a stepping stone, a link in the chain to designing the aircraft that saved Britain from invasion and defeat in the Battle of Britain.

I write this article to place on record the very great debt of gratitude the British people owe to 'That Other Few', the pioneer aviators, aircraft designers, builders and engineers of the world's first aircraft factory at Leysdown, Isle of Sheppey, Kent, England.

For further details please read my 1990 book: Leysdown the Cradle of Flight. The story of the world's first aircraft factory. Published by Santa Maria Publications to commemorate the fiftieth anniversary of the Battle of Britain.

1: Drawing of an Army Aeroplane Wireless set in 1910.

2: The Short Brothers.

3: An early Royal Naval Air Service Transmitter Type 52b of 1916.

British Vintage Wireless Society

Statement of accounts 6th April 2002 to 5th April 2003

	2002/2003	2001/2002
Income		
Subscriptions	£37,543.50	£24,820.91
Sale of publications	£818.55	£503.30
Meetings	£13,030.71	£10,241.32
Miscellaneous	£94.99	£724.00
Bank interest	£338.86	£8.50
Total Income	*£51,826.61*	*£36,298.03*
Expenditure		
General expenses	£7,244.43	£7,229.00
Meetings	£7,078.19	£5,953.97
Bulletin costs	£20,960.67	£27,336.34
Other publication costs*	£8,197.73	£804.50
Exceptional items**	£10,000.00	£ -
Total expenditure	*£53,481.02*	*£41,323.81*
Income surplus (deficit)	**-£1,654.41**	**-£5,025.78**

Matched by a corresponding increase (decrease) in assets

Assets	**2002/2003**	**Movement**	**2001/2002**
HSBC current account	£9,809.09	£864.18	£8,944.91
HSBC deposit account	£19,288.04	-£711.96	£20,000.00
Lloyds current account (closed)	£-	-£1,421.58	£1,421.58
Lloyds deposit account (closed)	£-	-£1.66	£ 1.66
Giro (closed)	£-	-£383.39	£383.39
Cash	£-	£-	£-
Total assets	*£29,097.13*	*-£ 1,654.41*	*£30,751.54*
Increase (decrease) in assets	**-£1,654.41 -£**		

Matched by a corresponding income surplus (deficit)

Peter A. M. Weiss (FCA)

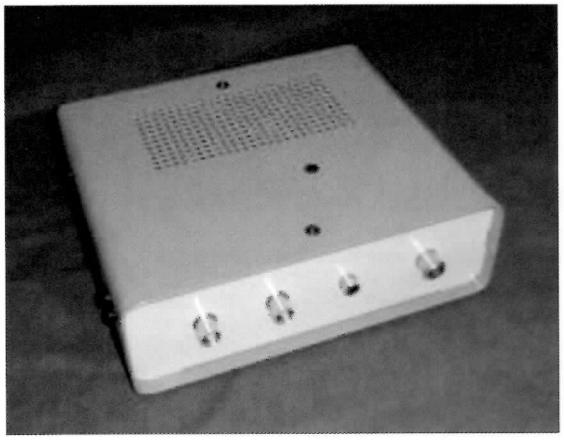
Jeffrey Borinsky
Honorary Treasurer

* "Other Publication Costs" include £7546.65 for printing of Gerry Wells' autobiography

** The exceptional items are: £4000 as first instalment to purchase the National Vintage Communications Fair. £6000 start up loan to the National Vintage Communications Fair.

The accounts of the Society are recorded in double-entry book-keeping and constructed on a cash timing rather than an accrued basis. As an unincorporated club, all surplus is passed to members by way of Bulletins, supplements and events. At the same time a prudent asset balance is maintained in order to provide for the unexpected.

DOMINO 405 Line Standards Converter.



- Fully built and tested ready for use, in a high quality metal case. 203 x 177 x 65mm.
- Converts 625 line video source to 405 line black and white video and VHF signal on **Band 1 channel 1** (Alexandra Palace)
- The converter will convert off air (live) transmissions received via the tuner of a VCR, VHS or DVD.
- Digital conversion using 2 line interpolation and built in crystal controlled modulator to produce high quality linear, stable pictures.
- 18dB attenuator supplied to match the high converter output to your television.
- Powered by 12V DC power unit, supplied

Specifications:

- 625 line video input via BNC connector at 1V/75 ohm
- 405 line video output via BNC connector at1V/75 ohm
- Audio input via Phono connecter
- 405 line VHF output via coaxial connector at 75 ohms.
- Output on VHF band 1 channel 1 at approx 200 millivolts p-p.
- Vision 45 MHz. Sound 41.5 MHz.

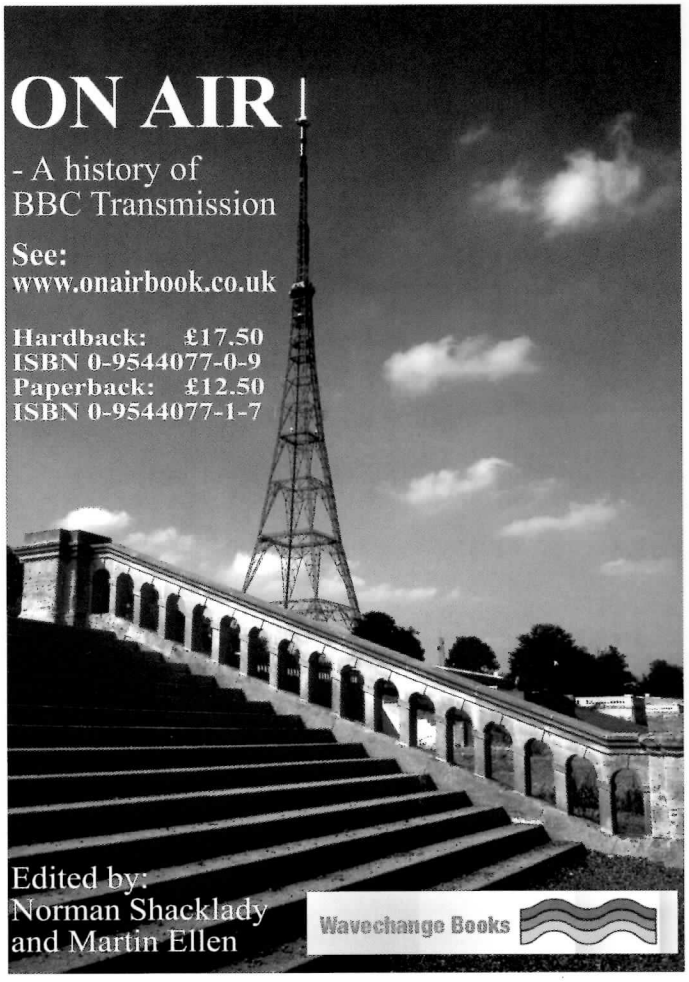
Soon to be available: Test Card Generator and other channels.

405 Line Standards Converter £400 (inc. P+P within the UK)

Please make cheques payable to **Malcolm Everiss** with your name and address on the back and send to the following address:
26 Castleton Road, Swindon. Wiltshire. SN5 5GD. Tel: 01793 886062 or 01793 877927 Email: malcolm@malcolmandgraham.co.uk

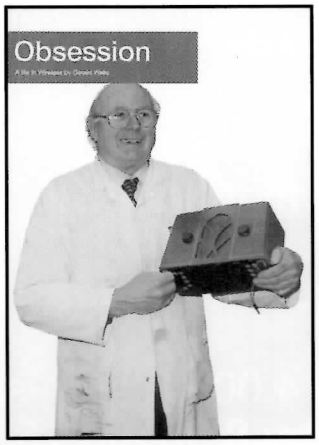
Orders will only be accepted with payment enclosed.

All equipment is hand built and tested and comes complete with a 12 months guarantee that covers faulty components and labour. This does not cover any transport costs for the return of the equipment nor accidental damage to the equipment on your part however caused. The guarantee will be void if the case seals are tampered with. All equipment is dispatched within 30 days of receiving your order.



Obsession

by Gerald Wells



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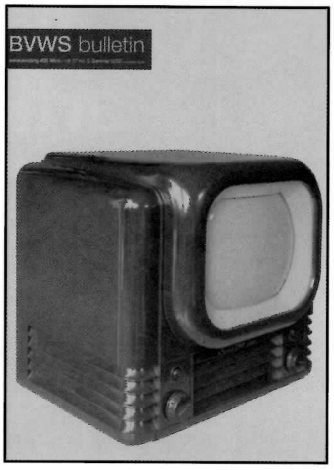
Back issues

Vol 10 Numbers 2, 3 & 4 Inc. The KB Masterpiece, Extinct Species "A Monster Defiant".
Vol 11 Numbers 1, 2, 3, 4 Inc. BTH VR3 (1924) receiver, Marconi's 1897 tests, Origin of the term 'Radio', Baird or Jenkins first with TV?
Vol 12 Numbers 1, 2, 3, 4 Inc. the Emor Globe, The Fultograph, Ekco Coloured Cabinets.
Vol 13 Numbers 1, 2, 3 Inc. Direct action tuning, The Philips 2514, Noctovision.
Vol 14 Numbers 1, 2, 3, 4 Inc. Cable broadcasting in the 1930's, The story of the Screen Grid.
Vol 15 Numbers 2, 3, 4 Inc. The wartime Civilian Receiver, Coherers in action, Vintage Vision.
Vol 16 Numbers 1, 2, 3, 4 Inc. The Stenode, The Philips 2511, Inside the Round Ekcos.
Vol 17 Numbers 1, 3, 4, 5, 6 Inc. Wattless Mains Droppers, The First Philips set, Receiver Techniques.
Vol 18 Numbers 3, 4, 5 Inc. The First Transistor radio, The AVO Valve tester, The way it was.
Vol 19 Numbers 1, 2, 3, 4, 5, 6 Inc. The Birth of the Transistor, Super Inductance and all that, reflex circuits, A Murphy Radio display, restoration.
Vol 20 Numbers 1, 2, 4, 5, 6 Inc. Radio Instruments Ltd., Japanese shirt pocket radios, Philco 'peoples set', notes on piano-keys, the story of Pilot Radio, the Ever Ready company from the inside, the Cambridge international, the AWA Radiolette, this Murphy tunes itself!
Vol 21 Numbers 1, 2, 3, 4 Inc. Marconi in postcards, the Defiant M900, GPO registration No.s, Personal portables, the transmission of time signals by wireless, the Ekco A23, historic equipment from the early marine era, the birth pains of radio, inside the BM20, plastics, Ferdinand Braun, pioneer of wireless telegraphy, that was the weekend that was, the first bakelite radios, BVWS - the first five years, the world of cathedrals, Pam 710.
Vol 22 Numbers 1, 2, 3, 4 Inc. Another AD65 story, the Marconiphone P20B & P17B, listening in, communication with wires, the story of Sudbury radio supply, French collection, Zenith Trans-oceanics, Farnham show, Alba's baby, the first Murphy television receiver, AJS receivers, Fellows magneto Company, Ekco RS3, Black Propaganda.
Vol 23 Numbers 1, 2, 3, 4 Inc. Sonora Sonorette, Bush SUG3, RNAS Transmitter type 52b, North American 'Woodies', Why collect catalin, Pilot Little Maestro, Theremin or Electronde, The Radio Communication Company, Early FM receivers, an odd Melody Maker, Black propaganda.
Vol 24 Numbers 1, 2, 3, 4 Inc. The Superhet for beginners, Triode valves in radio receivers, History of GEC and the Marconi - Osram valve, KB FB10, Great Scotts!, Riders manuals.
Vol 25 Numbers 1, 2, 3, 4 Inc. Repair of an Aerodyne 302, Henry Jackson, pioneer of Wireless communication at sea, Zenith 500 series, Confessions of a wireless fiend, RGD B2351, John Bailey 1938 Alexandra palace and the BBC, Ekco during the phony war, Repairing a BTH loudspeaker, The portable radio in British life.
Vol 26 Numbers 1, 2 Inc. How green was your Ekco?, The Amplion Dragon, Crystal gazing, The BVWS at the NEC, Installing aerials and earths, novelty radios, Machine-age Ekco stands of the 1930s, Volksempfänger; myth and reality.



Supplements:
1 'The story of Burndept'.
2 'WW 1927 data sheet'
3 'Seeing by wireless' the story of Baird Television
4 Reproduction Marconi catalogue

Earlier Bulletins and supplements are priced at £2:00 each + postage. Bulletins from volume 21 onwards are priced at £2.50 each. + postage.

Postage:
for individual Bulletins add 50p, for 2-5 bulletins add £1, for 6 or more add an extra 20p each. 23 Rosendale Road, West Dulwich London SE21 8DS Telephone 020 8670 3667.

Cheques to be made payable to 'The Vintage Wireless Museum'.

News and Meetings

The keeper of the list
Martyn Bennett still has the role of custodian of the BVWS list of GPO Registration Numbers. As many members will know the project of assembling this list was started in the early days of the BVWS and, more recently, has been enthusiastically carried on by Pat Leggatt. Members are strongly urged to help build the list, whenever they get the opportunity, particularly as it is something that will help with the identification of vintage wireless in years to come. The list is by no means complete and the GPO no longer have a record of the numbers granted to wireless manufacturers. The BVWS Handbook contains the current listings - one in numerical order and one ordered by name. Please let Martyn have any additions, or suggestions for corrections, by mail or over the phone.

Contact address:
Martyn Bennett, 58 Church Road, Fleet, Hampshire GU13 8LB
telephone: 01252-613660
e-mail: martyB@globalnet.co.uk

Exhibition in Swansea
An exhibition is to be staged at the Swansea Museum, Maritime Quarter, Victoria Road, Swansea for two months commencing September 28th 2003. To include vintage cinema projection equipment, sound equipment/vintage theatre lighting equipment, a varied display of narrow gauge and home movie equipment including Super 8, Standard 8/9.5mm/16mm/cameras and projectors, posters, sound equipment, signs, general cinema and theatre memorabilia.

The exhibition will be biased to many of the Welsh valley cinemas that have now disapeared. Some of the exhibits will be from the South West's PPT's collection and hopefully this exhibition will stimulate interest and education within the film and cinema industry as well as the general public. Support is being given by the PPT, BKSTS, National Sound and Screen Archive of Wales, Odeon Cinemas and SGRIN.

Details can obtained from: Swansea Museum, Maritime Quarter, Victoria Road, Swansea. Telephone: 01792 653763

Or: Chris Plaister, South West coordinator Projected Picture Trust, Telephone: 01633 815543

2003 meetings

Sept 7th Harpenden

Sept 28th NVCF
Stall bookings/Details: NVCF: 122B Cannon Street Road, London E1 2LH
Tel: 07947 460161 http://www.nvcf.org.uk

Oct 19th Workshop at Gerry's
Oct 26th Southborough

Oct 26th Leeds Vintage Audio Fair
(contact Andy Wilcox: 0113 266 4077)

Nov 23rd Harpenden
Nov 23rd Holiday Inn, Haydock, Lancashire
(contact Andy Wilcox: 0113 266 4077)

Dec 7th Wootton Bassett, Swindon

New Articles
If you have anything interesting to say concerning Wireless, Television, Broadcasting, Collecting etc. please send it to the Editor for future publication in the BVWS Bulletin. Your article can be just a few paragraphs long if you think it conveys its message to your fellow members. Also if you have any photographic material that would look good in the Bulletin, don't hesitate to post it to the Editor. The chances are that I will definitely use it!

Please send to: Carl Glover, 33 Rangers Square, London SE10 8HR. Tel: 020 8469 2904 email: choris.b@virgin.net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