The Bulletin

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The Bulletin of the British Vintage Wireless Society £5.00 | free to members ISSN 0955-9345

BVWS Auction

Wootton Bassett, September 28th 2008.

High quality equipment from the pre–broadcast era to the late 1920's and early 1930's

Pictures of the items will be available, along with a downloadable catalogue from the BVWS website late July/August 2008.

Mobile phones are prohibited at this event!

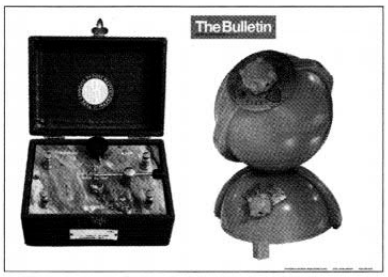
Venue: The Memorial Hall, Station Road, Wootton Bassett. Swindon.

Viewing from 9 am • Sale starts promptly at 10 am

Bulletin of the British Vintage Wireless Society
Incorporating 405 Alive
Volume 33 No.2 Summer 2008

www.bvws.org.uk

Separations and Printing by Hastings Print



Cover: front – Pixytone radio, 1950s.
Rear – Astrophone crystal set by Amplifiers Ltd. 1920s

Photographed by Carl Glover

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Ian Higginbottom and Peter Merriman

Contents

From the Chair

Having now recovered from all of the excitement of the NVCF and the June Harpenden meeting, the next Wootton Bassett event on 6th July seems just around the corner.

This years NVCF was certainly very well attended both by stallholders and visitors alike. Stalls for the event were a sell out, and could have been more if space had been available. Visitors were greeted by a street organ and barrel organs whilst awaiting entry and a display of mechanical music was held at the far end of the hall. The Society would like to express their thanks to Jeff Borinsky and all of the members of the mechanical music organisations who staged the display and entertained us throughout the day.
I can report that the event made a healthy return after costs as will be seen in the NVCF accounts which will be published when completed.

There will be a special BVWS auction staged at Wootton Bassett on September 28th 2008. This will be an auction day and not a Swapmeet. We have been engaged to sell items from three separate collections. The contents of this auction can be summed up with one word, "Quality". Many of the items are very rare and almost never seen nowadays. They are also in superb condition. Items range from an original Marconi Coherer of 1898 to early pre WW1 valves and equipment on through to the late 1920's. The auction will be split into sections and catalogues and pictures will be available from the BVWS website sometime around the end of July to mid August.
With this in mind I will sign off now as there is plenty of work to be getting on with, and wish you all a pleasant summer 2008.

Cray Valley radio Society puts the British Vintage Wireless and Television Museum on the air in 2008

Last year over 25 members of the Cray Valley Radio Society spent a very pleasant evening in the company of Gerry Wells at the British Vintage Wireless and Television Museum. This year it is 100 years since the Museum's home, 23 Rosendale Road in Dulwich South London connections with wireless began. That was when founder member of the London Wireless Club (later RSGB), Alfred Rickard-Taylor took up residence at the address. With one of the first transmitting permits to be issued he was on the air as 2AF with spark from that address as early as 1908.

To celebrate this fact, it was suggested during the visit that CVRS would be honoured to commemorate the event with a Special Event Amateur Radio Station.

Amateur radio is not a static hobby and has moved along as quickly over the last 20 years as all other areas of technology, and the equipment in use has grown ever more reliant on microprocessor control and digital technology. Often, it is this display of modern technology that is part of the appeal of a special event station. In this case however an 'all singing all dancing' station would look out of place in a building commemorating the technology of a bygone era. With that firmly in mind, it is intended that at least two HF stations will be on the air and at least one of them will run equipment from the thermionic era so as to fit in with the spirit of the Museum. This has of course, to be balanced with running a reliable operation for a complete weekend so for the other station, the club's normal equipment will be in use as well.

Dates of operation

It is planned to be on the air over the weekend of the 26th to the 29th of September and hopefully take advantage of the last of the summer sun.

Callsign

As previously mentioned the first callsign ever to be aired from the house was 2AF and with that in mind the callsign that has been reserved for the event is GB2AF. This callsign has been used at previous events at the Museum and was the one suggested by Gerry as his first choice.

If you wish to attend the event please liaise with the Museum directly as tours are by arrangement. If you wish to know more about the planned special event please contact Guy Roberts G0UKN (CVRS committee member & BVWS member) at g1jxj@yahoo.co.uk or on 07957801025

The Cray Valley Radio Society

The Cray Valley Radio Society has been serving the amateur radio community since 1946. Memberhip runs to over sixty with ages ranging from 13 to over 80.
We run a range of radio related activities including training courses needed to obtain a transmitting licence and a regular agenda of special event stations, contests and lectures.
It meets on the first and third Thursdays of the month at the Progress Hall, Admiral Seymour Road Eltham SE9 and has 3 nets that meet for on air chats every week. If you would like to know more or come to a meeting please take a look at www.cvrs.org or email the Secretary at secretary@cvrs.org

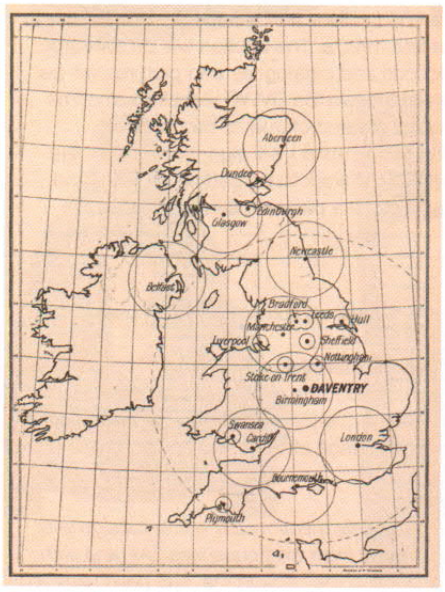
Crystal Sets and 2BE Belfast by Ian Sanders

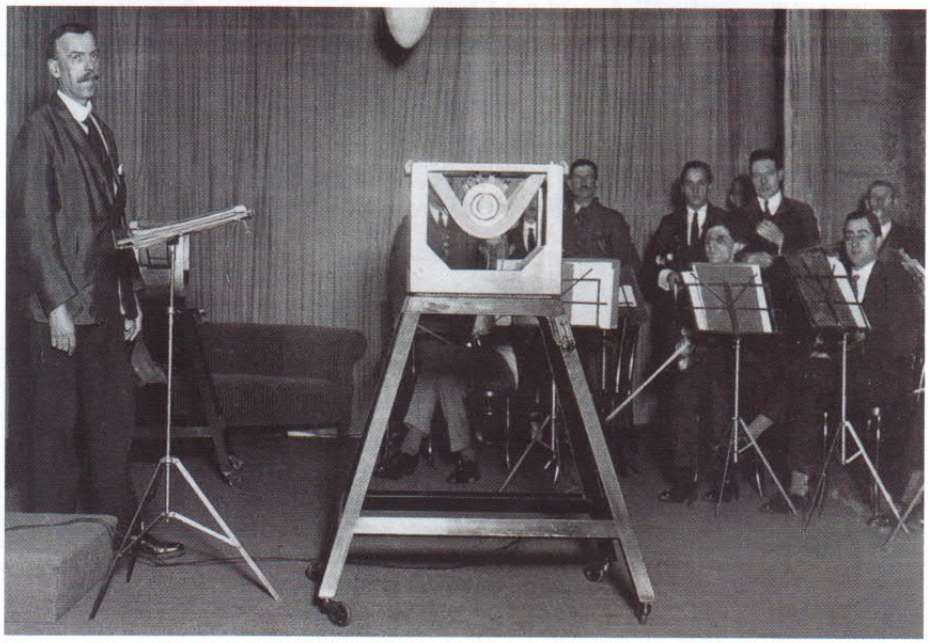
Belfast is to have a broadcasting station in two or three months' time. The wavelength will be 435 metres, and the call sign 2BE. The station is to be erected by the B.B.C. *Popular Wireless Weekly*, March 22nd, 1924.

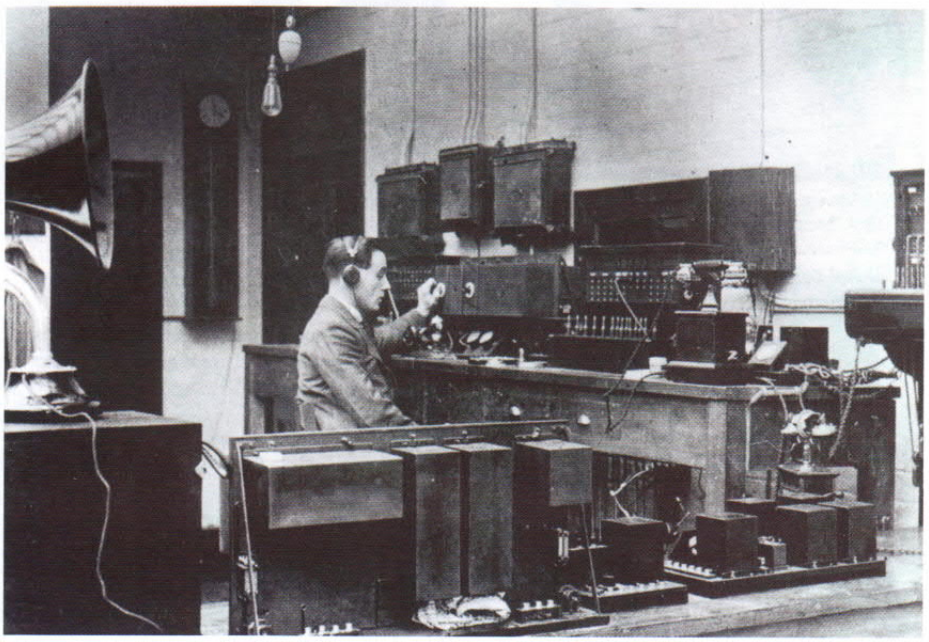
The original BBC broadcasting scheme put forward in May 1922 for eight local stations contained no plans for the province of Northern Ireland. Newly established in 1920 as an administrative division of the United Kingdom, broadcasting in the region was widely predicted to be a *"political and cultural minefield"* and, not surprisingly, the British Broadcasting Company did its very best at first to avoid any presence at all in the province[1]. By the middle of 1923, however, representatives of the Northern Ireland Radio Association, acting on behalf of the *"small man who could only afford a crystal set"*, began to gain ground and vigorously petitioned the BBC to establish a transmitter in the region[2]. In December 1923 – after due consideration was given to both the political situation and the protestations of owners of valve receivers who believed that such a transmitter would interfere with their reception of the existing BBC stations – permission was finally sought from the Postmaster General to build a local station in Belfast.

Consent was subsequently granted for transmission on a wavelength of 435 metres, despite the BBC's request for a longer wavelength to be considered (authority for a station in Dublin to transmit on 485 metres had apparently been previously approved – although 2RN, Dublin did not come on the air until January 1926 – and then on a wavelength of 386 metres). On February 14th, 1924, the BBC finally announced that Northern Ireland was to have its own radio station with original programme material to be produced locally. Recognising the delicate political situation that existed in the new province, operation of the Belfast station was conditional on the right of the government to close down transmissions at any time if it was deemed necessary on the grounds of national security.

With offices and a primitive studio set up in a derelict linen warehouse at 31, Linenhall Street, the BBC's Northern Ireland station, 2BE Belfast, commenced broadcasting on September 15th, 1924 under the leadership of Station Director, Walter Montagu-Douglas Scott*. The transmitter itself was located some distance away in a small attic space







Above: BBC stations in operation by the middle of 1925. With an approximate crystal range of 10–15 miles for main stations and 5 miles for relay stations, coverage was restricted to the major population centres, with much of the country not provided for. Northern Ireland depended almost entirely on Belfast, athough reception of the high-power station at Daventry, 5XX (opened in July 1925) might have been possible on a crystal set under favourable conditions. (Note: The circles in this figure represent diameters of 50 miles for main stations and 10 miles for relay stations – indicative of reception ranges for modest valve receivers, not crystal sets. The dotted circle represents a 200 mile radius for Daventry).

The Wireless Trader Yearbook & Diary, 1926. Published by The Trader Publishing Co., Ltd. London.

Above right: Godfrey Brown, Director of Music with the 2BE Wireless Orchestra in 1924. The Belfast station was given special permission from London to include a harp in their orchestra.

Right: The attic above the power station – the cramped 2BE control room in 1924.

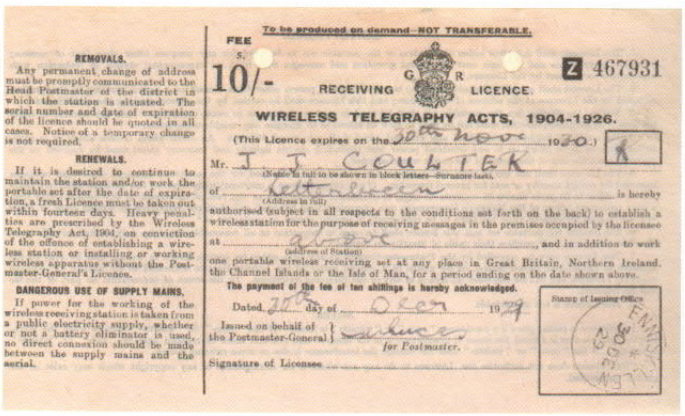
Left: Concert party broadcast from outside of the 2BE studio in Linenhall Street, ca. 1925. Standing in shirt-sleeves behind the Marconi-Sykes microphone in the right foreground is Tyrone Guthrie, one of the first writers to create plays especially for radio broadcast. Guthrie, who stayed with the station for two years, was responsible for all programme material with the exception of music and is credited with making the opening announcement when Belfast took to the air on September 15th, 1924: "Hello, Hello – this is 2BE, the Belfast Station of the British Broadcasting Company Calling

Photograph: Alex Hogg, Ulster Museum.

above the Albertbridge Road Power Station, the aerial prominently suspended between the building's tall chimneys. In order to simultaneously broadcast programme material from London, the transmitter was linked with 2LO by a circuitous Post Office telephone line running via Glasgow, Leeds, and Gloucester. The submarine cable, laid specifically for the BBC, was initially unsuitable for the transmission of high-quality music and so the burden of providing musical selections fell on the shoulders of the newly-formed Belfast Station Orchestra. Within a few months, however, the line – despite its length – was reported by the company to give very satisfactory results.

The Belfast station was formally inaugurated on October 24th, 1924, by which time the Post-Office had issued more than five thousand domestic licences within the province – the preponderance of the licences for listeners possessing some type of crystal receiver, according to official BBC estimates at the time. 2BE's opening ceremony received considerable publicity with Northern Ireland's Governor-General, Lord Abercorn, John Reith, Managing Director of the BBC and P.P. Eckersley, the company's chief engineer in attendance for the occasion.[3] On opening night, the *Belfast Evening Telegraph*[2] welcomed the fact that at long last Northern Ireland's listeners would finally be able to make use of low-cost crystal sets: *"The possibilities will now be brought home to the multitude. Hitherto wireless has been the recreation of the comparatively few in Northern Ireland owing to the absence of a local station. Soon there will probably be fifty crystal set holders for every one possessing the more expensive sets".*

The following day, an enthusiastic report in the morning *Irish News*[4] also highlighted the importance of the new station for crystal set owners': *"In countless numbers of houses within the magic circle of the Belfast Broadcasting Station, amateur 'listeners-in' waited with baited breath for the first message from the Director last evening. To say that their vigil was rewarded is to put it mildly, for, according to reports from every district of the city, and distant parts of the north-east, users of even the cheapest crystal sets were able to enjoy the delightful programme submitted. The clearness with which the various items were heard was commented upon by wireless enthusiasts, who were loud in their praise of the efforts of the officials of the station to provide such interesting programmes as they have arranged for the week".*



To be produced on demand—NOT TRANSFERABLE.

FEE 5/- 10/-

Z 467931

RECEIVING LICENCE

WIRELESS TELEGRAPHY ACTS, 1904-1926.

(This Licence expires on the 30th Nov. 1930.)

Mr. J. J. COULTER

(Name in full to be shown in block letters—surname last).

of Letterbreen

(Address in full)

is hereby authorised (subject in all respects to the conditions set forth on the back) to establish a wireless station for the purpose of receiving messages in the premises occupied by the licensee at

(address of Station)

and in addition to work one portable wireless receiving set at any place in Great Britain, Northern Ireland, the Channel Islands or the Isle of Man, for a period ending on the date shown above.

The payment of the fee of ten shillings is hereby acknowledged.

Dated the 7th day of Oct 1929

Issued on behalf of the Postmaster-General } for Postmaster.

Signature of Licensee

Stamp of Issuing Office

REMOVALS.

Any permanent change of address must be promptly communicated to the Head Postmaster of the district in which the station is situated. The serial number and date of expiration of the licence should be quoted in all cases. Notice of a temporary change is not required.

RENEWALS.

If it is desired to continue to maintain the station and/or work the portable set after the date of expiration, a fresh Licence must be taken out within fourteen days. Heavy penalties are prescribed by the Wireless Telegraphy Act, 1904, on conviction of the offence of establishing a wireless station or installing or working wireless apparatus without the Postmaster-General's Licence.

DANGEROUS USE OF SUPPLY MAINS.

If power for the working of the wireless receiving station is taken from a public electricity supply, whether or not a battery eliminator is used, no direct connexion should be made between the supply mains and the aerial.

Above: For the few residents, like Mr. J.J. Coulter, of the tiny hamlet of Letterbreen, Enniskillen, about 70 miles west of Belfast, the coming of broadcasting to Northern Ireland must have provided a much needed link with the rest of the country. At that distance, however, a one- or two-valve amplifier would have been needed to hear 2BE reliably on a crystal set, although by 1929 when this licence was issued, it is quite probable that Coulter was using a valve receiver.

Right: Badge of the 2BE Radio League, – Belfast's name for what other stations called the Radio Circle – an organisation for the BBC's younger listeners.

Séamus Hughes, first full-time radio announcer of 2RN, in the studio ca. 1926. Photograph reproduced by permission of RTÉ Stills Library, Dublin.

The Irish Free State

2RN, Dublin – the station's call-sign had originally been chosen by the British Post Office – started test transmissions in November 1925. The 1.5kW Marconi company transmitter, operated under the control of the Irish Post Office's Department of Posts and Telegraphs, was located at McKee Barracks near Phoenix Park and was formerly inaugurated in January 1926, becoming the first broadcasting station in the Irish Free State.

The station was initially allocated a wavelength of 386 metres, causing many listener complaints because of interference with the existing BBC's Bournemouth and Manchester stations (operating on 385 and 375 metres, respectively) and the more powerful Hamburg station, Nordische Rundfunk AG (395 metres). According to Irish Times[1], the wavelength had been deliberately chosen to block the BBC stations, especially Manchester which could often be received in Dublin on a one-valve receiver, or even with a crystal set under unusually favourable conditions. Succumbing to increasing public pressure, the wavelength was increased to 397 metres in March 1926 and subsequently lowered in November of the same year to 319 metres.

Programme material in the first years was primitive. Evenings began with a continuous "tuning tone" to enable listeners to adjust their crystal sets for maximum sensitivity. This was followed by a dull programme mix of foreign language lessons (including Irish) and uninspiring music produced on a meagre budget – patriotic songs and simple ballads. A highlight was the concert sporadically relayed from London.[2] No news or weather forecasts were broadcast in the first year since no arrangements with necessary agencies were put in place until later. The number of wireless receivers in Ireland was estimated at around 10,000 when 2RN took to the air and increased to approximately 25,000 by the end of 1926.[1] How many of these were crystal sets is not recorded.

Some idea of the extent of the internal development of the wireless trade can be gleaned from the statistics of the first Dublin Wireless Exhibition of 1925, organized by the Wireless Society of Ireland. Exhibits from companies based in Ireland numbered 24, while there were only two from the UK. According to Pine[1] some 37 Irish companies were active at that time.

Faced with mounting criticism from residents of Cork about the poor reception of 2RN, a 1 kW station, 6CK, broadcasting from the Women's Jail at Sunday's Well, Cork was opened in April 1927. The new station relayed some of 2RN's programmes, but produced much of its own material. In 1932, a high power 60 Kw station was established in Athlone, bringing much more of the country within crystal set range, although the original plan to shut down 2RN when it officialy opened in February 1933 was reversed when crystal set listeners in Dublin complained of poor reception of Athlone. At the time of the opening of the Athlone station, only about 30,000 wireless licences had been issued.

1 Pine, Robert: *2RN and the origins of Irish Radio*. Published by Four Courts Press, Dublin 2002.
2. *The Irish Companion*. Published by Think Books, London 2007.

Concerts at Belfast

Members of the Belfast Radio League have given several successful afternoon concerts, and many performers have subsequently assisted in the Children's Corner programme.

As time goes on, it is hoped that in every week a part of the programme for children will be broadcast by little boys and girls, as well as by the Aunts and Uncles.

The Radio Times, July 10th, 1925.

Wireless manufacturers operating in Northern Ireland between 1922 and 1926.

Company Name	Crystal Set Model
Electrical Installation & Repairing Co., 40 Berry Street, Belfast.	No details known
Galt & Sons, 85 York Street, Belfast.	No details known
Hill (George Jardine), c/o Rankin & Co., 4 Berry Street, Belfast.	No details known
J & D Jackson, 270 Upper Newtownards Road, Balyhackmore, Belfast.	Patriot
McVeigh, James Patrick, 84 Edward St., Lurgan, Co. Armagh	No details known
Rankin & Co., 4 Berry St., Belfast	No details known
Tyrone Wireless Supplies, Main Street, Strabane, County Tyrone.	No details known
Ulster Radio Co., 16, Wellington St., Belfast	No details known
Robert Walsh, 15, Scotch St., Armagh.	No details known
White, James Hemphill, Main Street, Strabane, County Tyrone.	No details known

Source: BBC files, National Archives, Kew. Courtesy of Lorne Clark.

News of the Week

WE understand that a question in the Northern Ireland Parliament led the British Broadcasting Company to investigate the possibility of establishing a broadcasting station in the North of Ireland.

It was found that there was a great demand for such a service in Ireland, particularly in Belfast. The company is anxious to make a start, but any decision will have to be shelved until the Broadcasting Committee has made its report.

Wireless Weekly, May 23rd, 1923.

The Ulster Station

BELFAST is due for preliminary programmes this week, but somehow nobody seems to know much about the progress of the Ulster station. Probably this is a good sign, for gossip provided us with some harrowing rumours about other main stations before they were erected; yet in the end they all "took to the air" with great éclat.

Popular Wireless Weekly, September 20th, 1924.

Provincial Stations

A ninth main station is coming into action at the moment of writing. This is to serve that portion of Ireland which is still proud to be recognised as part of Britain. The Belfast station has yet to make history, and everyone is looking forward confidently to some distinctive programmes from Mr. Water Motagu-Douglas-Scott, the station director, Mr. E. Godfrey Brown, the music director, and his staff at their studio 31 Linenhall Street. . .

It is uncertain whether Belfast will be able to contribute to the simultaneously broadcast programmes until a system of wireless relays has been instituted between Belfast and London, for the telephone line between these two capitals, apart from being some five or six hundred miles long, has to pass under the sea for about the same distance as the cables between England and France. Therefore whilst speech may be possible, some distortion of musical sounds may occur. But we live in the age of progress, so who knows?

Burrows, A.R: The Story of Broadcasting. Published by Cassell and Co., Ltd. London 1924.

Arrangements at Belfast

THE call-sign 2BE has been allotted to the new station, which will work upon a wavelength of 435 metres. Scientific talks of a popular nature by Queen's University professors are being arranged. Mr. Godfrey E. Bron, conductor of the Belfast Philharmonic Society, has been appointed musical director.

Popular Wireless Weekly, August 16th, 1924.

News of the Week

ENTHUSIASM for wireless is strongly evident in the North of Ireland, especially in the Belfast district. As the nearest broadcasting station, however, is Glasgow, a distance of over 100 miles away, reception is not a very easy matter. There is a possibility of a local broadcasting station being in operation in the near future. The Ulster Minister of Commerce declared in the Northern Ireland Parliament last week that they only awaited an application by the British Broadcasting Co., to signify their willingness to co-operate.

Wireless Weekly, June 27th, 1923.

The question as to how many of the sets in use in the Belfast area in the first years of broadcasting were actually manufactured locally is difficult to assess. An examination of the British Broadcasting Company records at the National Archive, Kew[5] has revealed the existence of a number of wireless equipment manufacturers operating in Northern Ireland between 1922 and 1926, although how many of these firms produced domestic crystal sets is not known. Given the present lack of information concerning Irish manufacturers, however, it is likely that the number of crystal sets produced commercially within the region was relatively few. It is reasonable to assume at this point that the majority of the wireless receivers (including crystal sets) used in the early days of broadcasting in Northern Ireland were produced by companies from other parts of the United Kingdom.

*Montagu–Douglas–Scott was never highly regarded by the senior staff in London and was duly replaced in July 1926 by Gerald Beadle, a future Director of BBC Television. Notably, it was Beadle who promoted collaboration between 2BE and the Dublin station 2RN in the early years.

1. Loughrey, P: *Culture and Identity: The BBC's Role in Northern Ireland.* Published in: *Broadcasting in a Divided Community – Seventy Years of the BBC in Northern Ireland*. Editor, M. Mcloone, Queen's University, Belfast 1996.

2. Cathcart, R: *The Most Contrary Region – The BBC in Northern Ireland 1924-1984*. Published by The Blackstaff Press Ltd., Belfast 1984.

3. Sexton, Michael: *Marconi – The Irish Connection*. Published by Four Courts Press, Dublin 2005.

4 Quoted in Bardon, J: *Beyond the Studio – A History of BBC Northern Ireland*. Published by The Blackstaff Press Ltd., Belfast 2000.

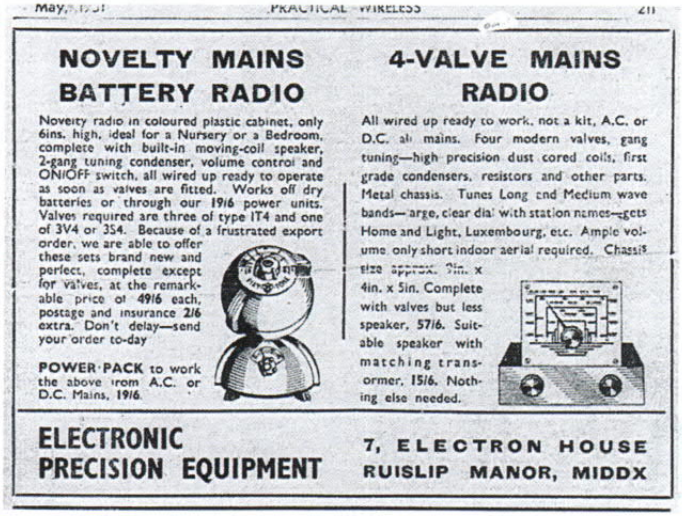
5. Lorne Clark – private communication.

The author would welcome any insight into companies manufacturing wireless receivers in Northern Ireland in the 1920s.

A Wireless Whimsy – The Pixytone novelty radio

Ken Brooks G3XSJ

After the cultural deep freeze of the second world war new shapes and colours appeared in homes, the trend exemplified by spindly space ship styling seen at the 1951 Festival of Britain. Wireless sets were not immune from these forces. If ever a radio looked like a stereotypical Martian with an oversized head precariously balanced on a tiny body it's this one, the Pixytone. Squeezed into one of the most unusual radio cabinets of its time it doesn't contain extra–terrestrial green slime, but nevertheless its contents were unexpected.



NOVELTY MAINS BATTERY RADIO

Noveity radio in coloured plastic cabinet, only 6ins. high, ideal for a Nursery or a Bedroom, complete with built-in moving-coil speaker, 2-gang tuning condenser, volume control and ON/OFF switch, all wired up ready to operate as soon as valves are fitted. Works off dry batteries or through our 19/6 power units. Valves required are three of type 1T4 and one of 3V4 or 354. Because of a frustrated export order, we are able to offer these sets brand new and perfect, complete except for valves, at the remarkable price of 49/6 each, postage and insurance 2/6 extra. Don't delay—send your order to-day

POWER PACK to work the above from A.C. or D.C. Mains, 19/6.

4-VALVE MAINS RADIO

All wired up ready to work, not a kit, A.C. or D.C. all mains. Four modern valves, gang tuning—high precision dust cored coils, first grade condensers, resistors and other parts. Metal chassis. Tunes Long and Medium wave bands—large, clear dial with station names—gets Home and Light, Luxembourg, etc. Ample volume only short indoor aerial required. Chassis size approx. 9in. x 4in. x 5in. Complete with valves but less speaker, 57/6. Suitable speaker with matching transformer, 15/6. Nothing else needed.

ELECTRONIC PRECISION EQUIPMENT

7, ELECTRON HOUSE RUISLIP MANOR, MIDDX

Pixytone advertisement *Practical Wireless* May 1951

A while back a local radio enthusiast passed away. He was an interesting character and we had chatted on occasions about our mutual interests in older communications equipment. There were occasional hints that his collection of radios was quite extensive but the word 'collector' didn't adequately describe him, who it was later found, had amassed a vast hoard which filled his house loft, garage, garage loft, garden shed, and two rented garages. Over the next weeks that turned into many months, volunteers came forward to sort, catalogue and dispose of his collection. Lists were produced which were rapidly supplemented as other equipment emerged to expand a lengthy schedule of bits and pieces.

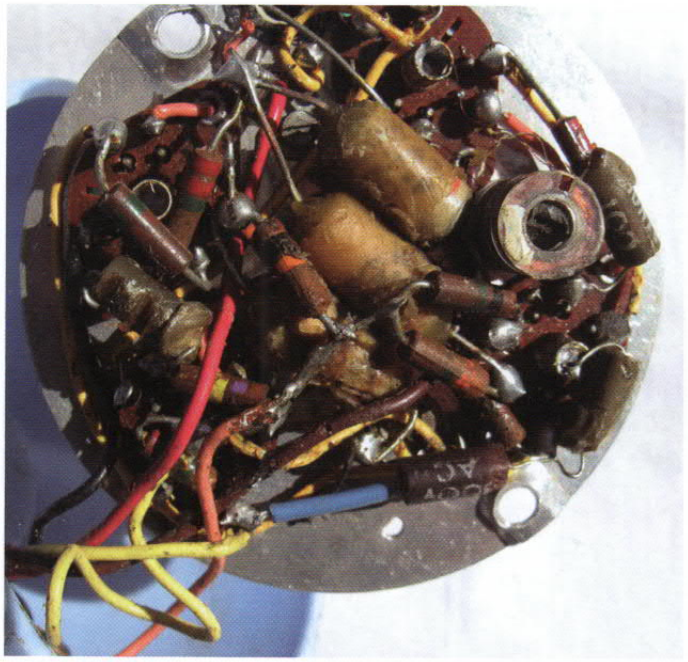
On my third visit to look at a few residual items I noticed two very dusty uncatalogued radios sitting forlornly on a shelf. I recognised them as sets once advertised in Practical Wireless or some similar journal, having registered them in my mind as crystal sets because of their small size. It was pointed out that one was missing its loudspeaker. Loudspeaker? In a crystal set? After some brief negotiation, cash was exchanged and the sets travelled home cosseted on the threadbare carpet of my MG Midget. During the journey I began thinking about what might be inside them. They weren't going to be crystal sets with a loudspeaker and I somehow associated them with late 1950's transistor sets.

A journey of discovery

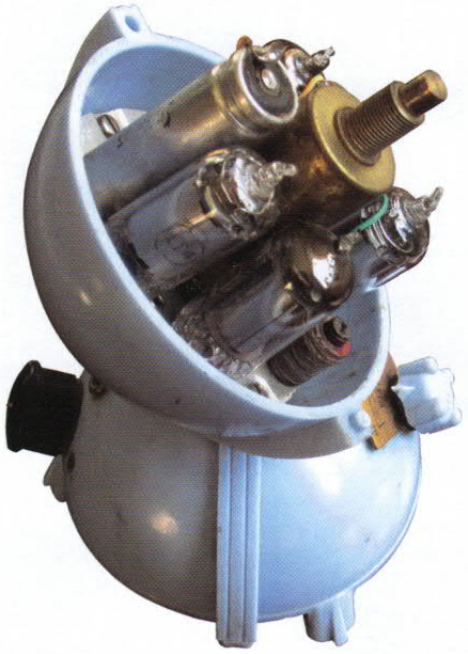
Once home I took stock of my purchases, one cream colour, the other an attractive sky blue. They looked like something from Dan Dare having a hemispherical base surmounted by an off axis sphere, and were under 6" high. I reported my find and thoughts to fellow BVWS member Henry Irwin who suggested that unless the cabinet had been reused with a later transistor circuit, they were valve sets using battery valves.

Careful dismantling did indeed reveal a four–valve battery receiver crammed so tightly inside that they might have been built by very nimble pixies. Intrigued by all this, attempts were made to find out something about the makers, Ingleburn Products, whose microscopic logo was just visible on the tuning scale. Gordon Bussey suggested I made contact with the Bodleian Library and they provided some background material on the manufacturers.

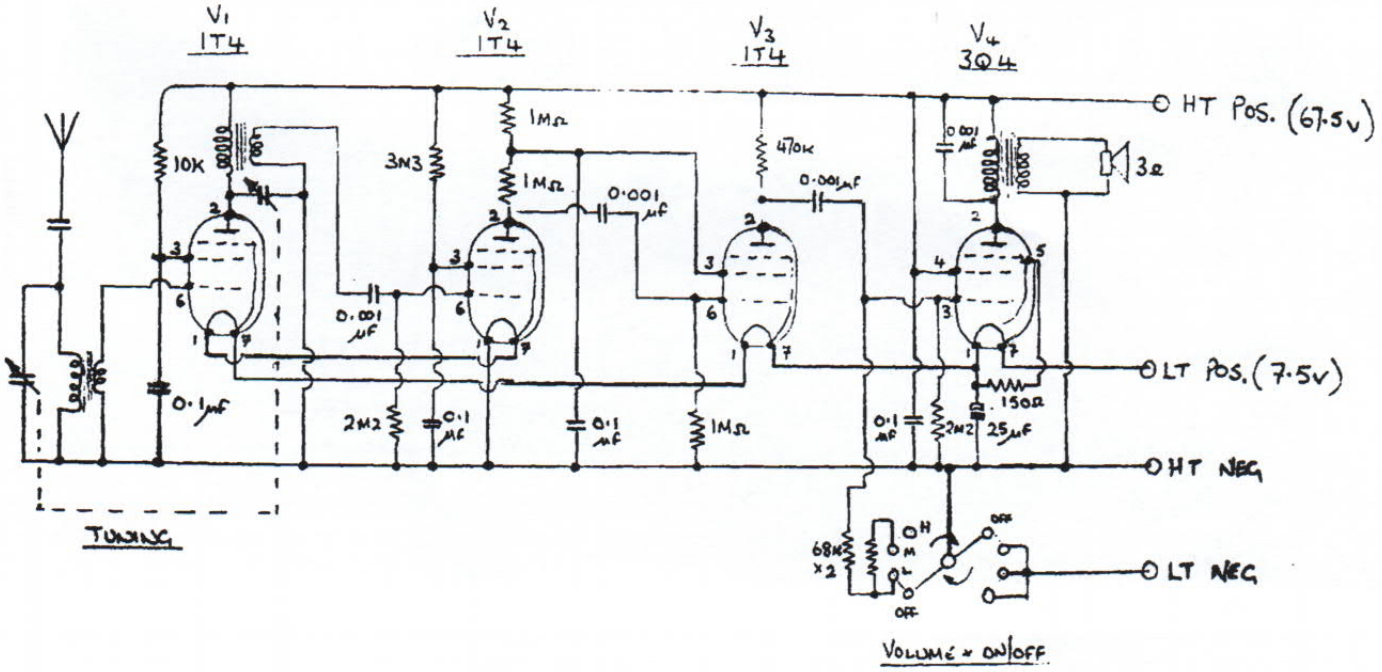
The 1950 *Wireless & Electrical Trader Year Book* listed Ingleburn Products Ltd under the heading " Soldering Irons and Tools, Electric" at 40 High Street, Malmesbury. The *Electrical and Radio Trading Year Book* did not list the firm in 1950 or 1951 but did in 1952, giving



Underneath the chassis



Futuristic space weapon - the works revealed



the address as Wynyard Works, Malmesbury.

The pretty Wiltshire market town of Malmesbury is not far from my home and a visit to explore the two addresses was made. Readers of *"The Setmakers"* may recall that Ekco had a shadow factory in Malmesbury during the war. One of their sites was 40 High Street. The two former Ingleburn premises were readily located and photographed, but what of the name Ingleburn? A town map revealed that a river running through the town is known as the Ingleburn. Next call on my pedestrian tour was the Athelstan Museum where I was provided with the name of someone who had worked for Ingleburn.

A phone call established that the company was formed after the war by an ex–Ekco engineer and it seems they then sensed an opportunity in the novelty radio market. Now, novelty radios quite obviously need novelty cabinets and Ekco were well established makers of plastic mouldings. It does not require too much imagination to guess that the former Ekco staff probably made use of contacts in their former employers to source the mouldings.

My contact went on to reveal that very significant export orders were predicted, wrongly, as it turned out, and the excess production was sold off through adverts like those in Practical Wireless.

A closer look

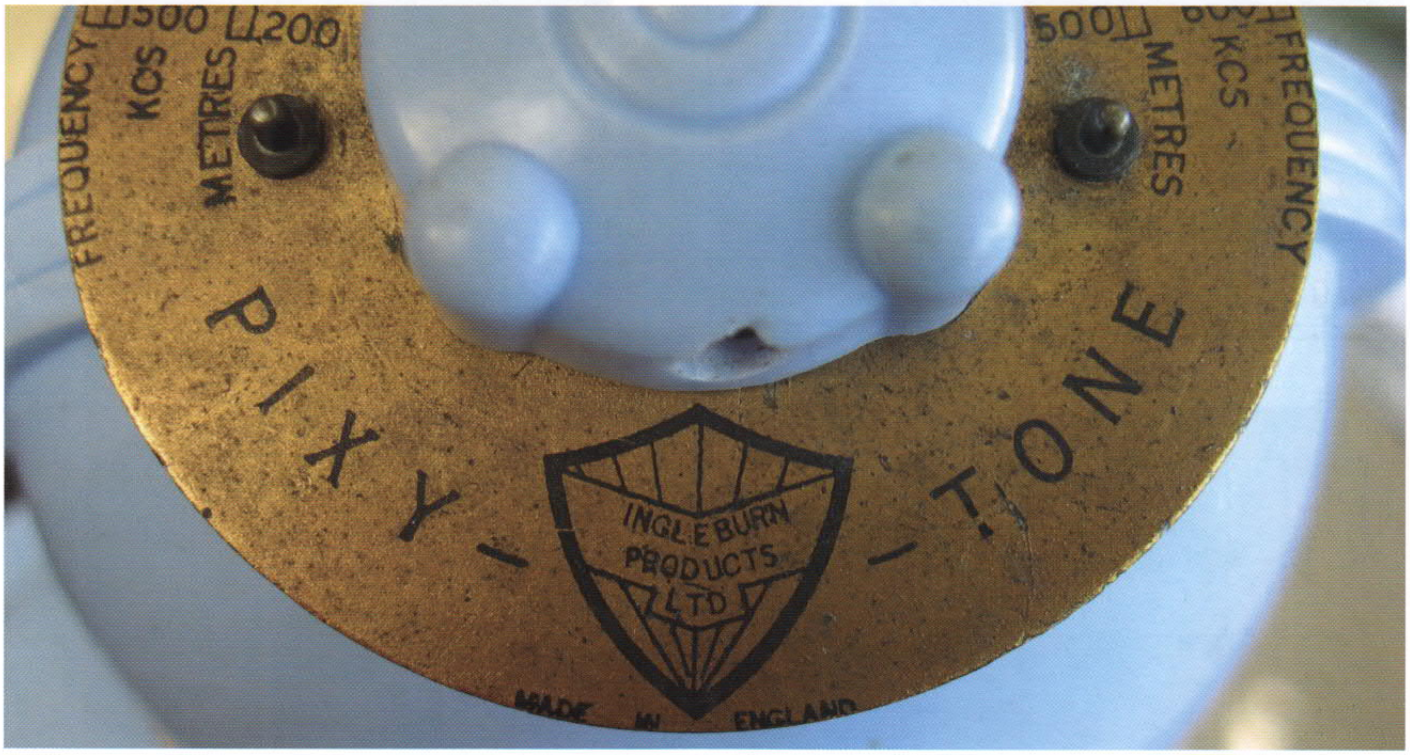
The plastic cabinet comprises three similar hemispherical mouldings. Each has a raised rib running along the circumference at the end of which is provision for attaching further parts. Actually, the phrase "raised rib" does little justice to the feature which might be likened to the shape of a flying buttress on a church building.

The first hemisphere forms a base and speaker housing and the remaining two hemispheres are joined to form a spherical enclosure for the receiver itself. A further moulding comprises an elegantly designed loudspeaker grille, sadly out of sight beneath the set. In the same colour as the set are the control knobs, a quirky theme being scaled for the two sizes used. These are quite delightful and add to the sets' playful, nursery styling although nowadays, in a world dominated by safety concerns, one might not wish to use this set in a nursery for reasons we shall shortly explore.

A downward facing loudspeaker is raised just 10 mm above the surface on which the radio is placed so the volume level achievable by this arrangement must have been modest indeed. The lower hemisphere also has a B7G socket for the incoming power. Note the word "socket". Incoming power from the optional AC/DC power unit, and a

40 High Street, Malmesbury - first Ingleburn premises

Wynard Works in 2008 - now a private dwelling



Microscopic printed scale

safety worry by definition, is distributed through male pins on a B7G plug. This type of connector is held in place by friction alone and if accidentally withdrawn with power applied, the pins become exposed live conductors, with the distinct possibility of one being connected to the National Grid. No CE approvals then!

The receiver chassis is a thin circular aluminium plate with a centrally mounted tuning capacitor. This was specially made for the set and is fully screened. Four valves make for a very tight fit above the chassis but the underside is what might be described as a servicing nightmare. Components are suspended from wiring which has solder joints in mid air, that is, joints formed in the wiring with no rigid attachment. Very fine wire is used throughout and some components are buried under others, making for a very compact assembly indeed. There is no volume control, instead a combined switch selects "off-soft-med-loud". The tuning scale is calibrated from 600 - 1500 kcs and also 200 - 500 metres. A second cream–coloured set has an additional waveband switch and reputedly is a prototype two band version, although the tuning scales are identical.

And finally

Wireless sets are defined by their cabinets. Sets in round cabinets have been made over the decades with the round Ekco being an iconic example. Over a brief post–war period a limited range of British spherical sets were produced, the best known probably being the metal cased *Emor Globe* of 1946. A year later there was also the *Champion Venus* made from heat formed acrylic sheet. Both sets were mains powered and much larger than the Pixytone.

The *Pixytone* is to my mind altogether different and in many respects represents a more radical design. The size is diminutive, the mouldings are of exquisite design and quality, the colours striking. Overall we are presented with a product that is unique and whimsical in the extreme, perhaps bordering upon kitsch. As with many eccentric novelty products it is not especially practical, and in an age of austerity all these characteristics inevitably ensured it was doomed to commercial failure. An anonymous crystal set was marketed using just two of the hemispherical mouldings but appears to have been an opportunistic use of the remaining parts. It was a sorry end to the original visionary endeavour.

Acknowledgements

1. Colin Boggis, BVWS, Pixytone circuit diagram.

2 David Forward, Athelstan Museum, introductions and background information.

3. Frederick Hay, BVWS, image of the Pixytone carton.

4. Michael Hughes, Bodleian Library, University of Oxford, company information.

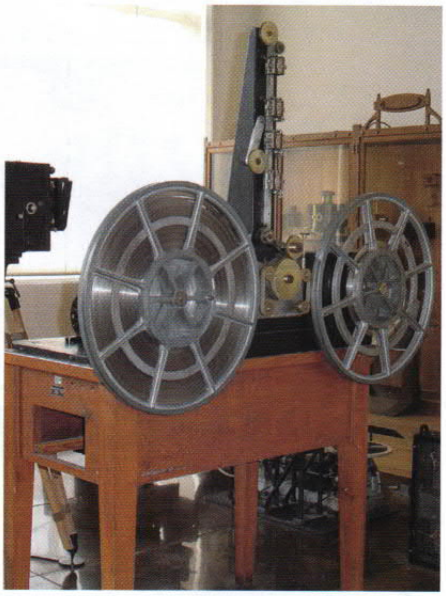
5. Henry Irwin, BVWS, scan of period advertisement.

It's Museum Time Again!

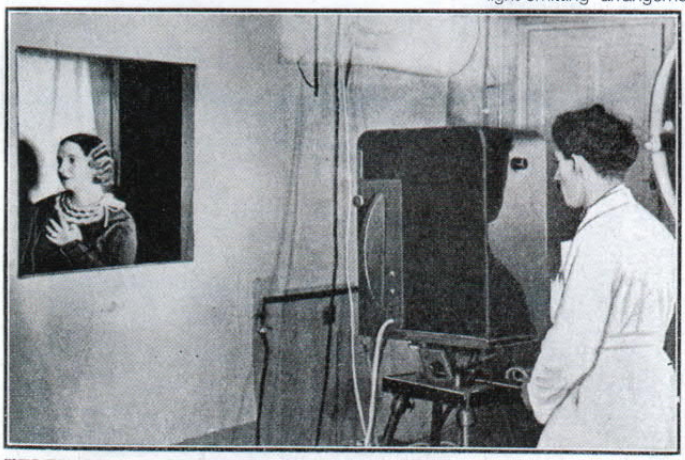
Dicky Howett trips around Paris

Type THT 620 with the awkward turret.

Rene Barthelemy 'camera'. Disc spinning/ light emitting arrangement perhaps?



The 1930 Blattnerphone. Behind a blimped Debrie 'Parvo' 35mm movie camera can be partially seen.



TELEVISING A " CLOSE-UP " IN THE STUDIO OF A FRENCH TELEVISION STATION. THE SCANNING AT THE TRANSMITTER OPERATES ON A MECHANICAL PRINCIPLE AND A PART OF THE COVER OF THE SCANNING DISC CAN BE SEEN PROTRUDING FROM THE SIDE OF THE CASE

The Rene Barthelemy camera in situ. 1930s photograph.

Mrs Howett takes note of the type THT 620 camera.

On a weekend visit to Paris, (and having been given a Gallic bum steer), I eventually found a delightful tv/radio related museum. Not situated, as the Paris web site indicated (it's still listing some entrance fees in Francs) at the doughnut-shaped Radio France across from the Eiffel Tower, but instead, away down at the jolly Rue Réaumur. Here we find the Musée des Arts et Métiers housed in a sort of restored church. This museum has over 3,000 inventions on display including Scientific Instruments, Transportation, Energy, Mechanics plus a little bit of film, tv & radio. It was here I spotted a rare bird indeed, a P.E.S Photicon (Iconoscope type) tv camera from the 1950s. A French re-engineered version that is, although the 'Pye of Cambridge' antecedents are plain for all to see. Dated 1960, this SCF-TH (Thomson Houston) 620 re-jig is patently incomplete, judging by the very odd looking turret ensemble which would never accommodate a bundle of stout 'Ortal' lenses. A travel cover perhaps? No explanation and of course no lenses evident.

Still, the over-engineered and king-sized focus handle made up for any deficiencies. Pleased also to spot a steel-tape recorder from 1930 called a Blattnerphone, sporting its usual five (this included spares) vertically mounted record/erase heads. Again this item looked strangely incomplete, sitting as it did on a stout wooden kitchen table and not the usual metal control box arrangement. Further along, was a Rene Barthelemy 'camera' with the splendid portmanteau moniker of 'Telephonovision. This quite bulky camera was used in the early 1930s at the Studio de Grenelle in Paris. Of mechanical scan design, this camera appears to be disc-based, but whether, the 'spotlight' scanning came from within the camera or available light was used, it was difficult to determine. The information given about this camera was sketchy, but as with most museums I've visited recently, critical information can be woefully inaccurate (our own Science Museum falls short here) with incomplete, misdated and

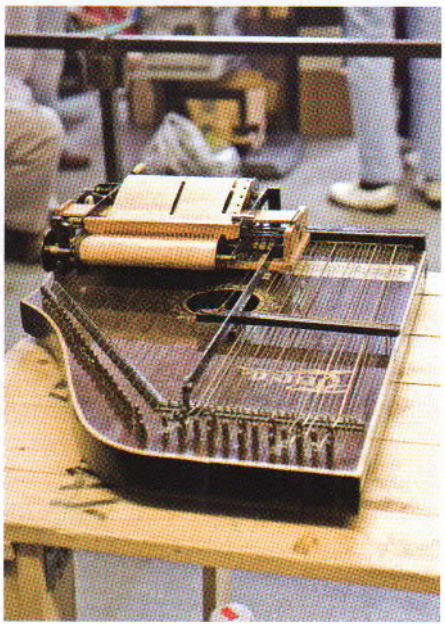
A 1955 French tv receiver. The THT 620 camera reposing in the background.

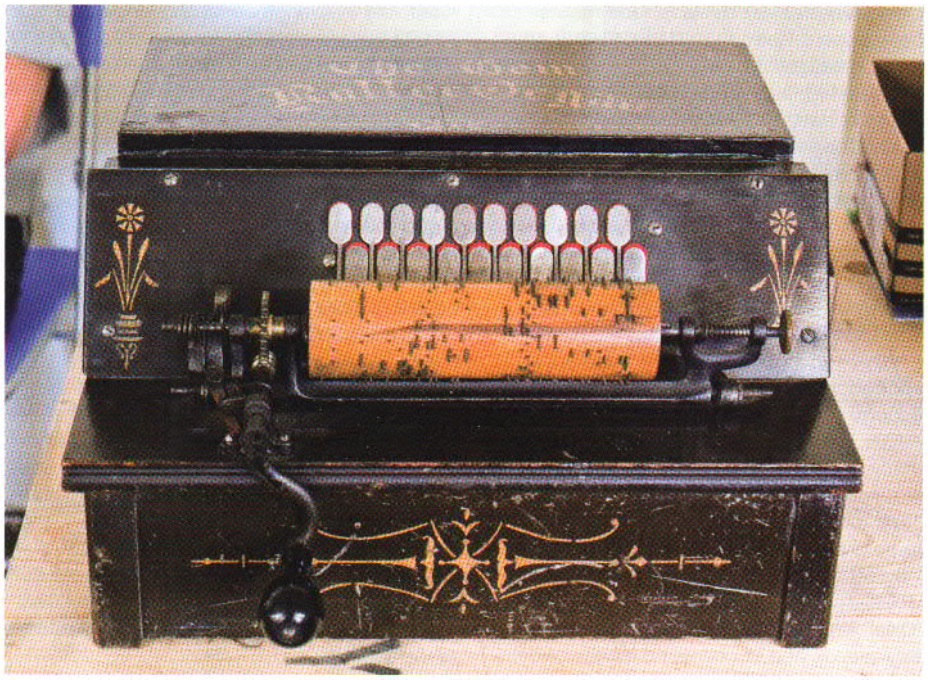
generally misattributed artefacts displayed as the 'real thing'. This circumstance is at best, unhelpful, at worst, a deception. Perhaps I'm just getting difficult to please?

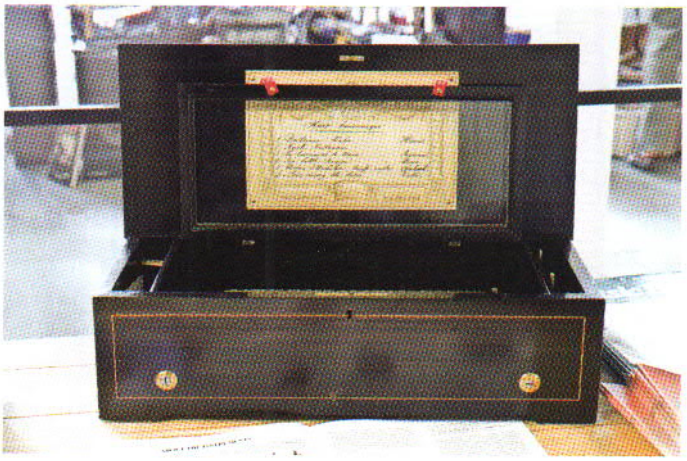
Musée des Arts et Métiers. 60 rue Reaumur. Paris
www.arts-et-metiers.net

Special exhibit of Mechanical Music, NVCF May 11 2008

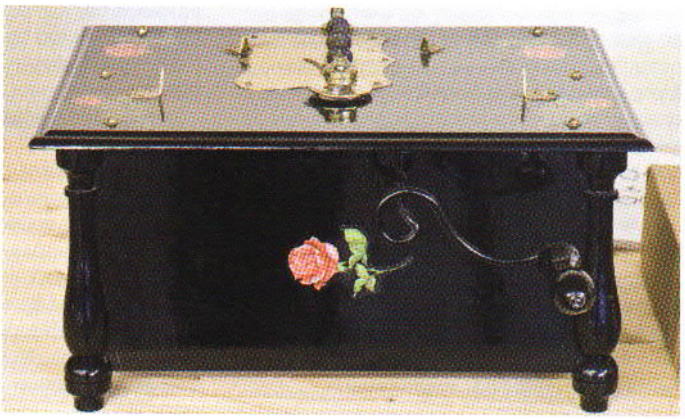
Photography by Carl Glover








Harp harmonique
SPIRALSAMPFER
EXPRESSIF



The Beam Tetrode

by LL (Bill) Williams

I have become increasingly aware of some very fundamental misunderstandings of this very important type of power amplifier have been repeated over and over again in various texts printed in the last half–century, so that they are now widely believed to be true. I recently read that the beam plates in a beam tetrode are connected to the screen to collect secondary electrons. They are always connected to the *cathode* to *repel primary electrons* and prevent them from entering regions of the screen to anode space in which a virtual cathode cannot form due to the geometry of the electrodes, which in early types, e.g 807, 6L6, KT66 etc, was determined by the need to build the valves using existing techniques that could not produce the required construction. Modern designs of beam tetrode use an electrode geometry which enables the device to achieve its full potential, resulting in higher efficiency, much higher output for a given size and operation from audio to UHF all without the use of beam plates.

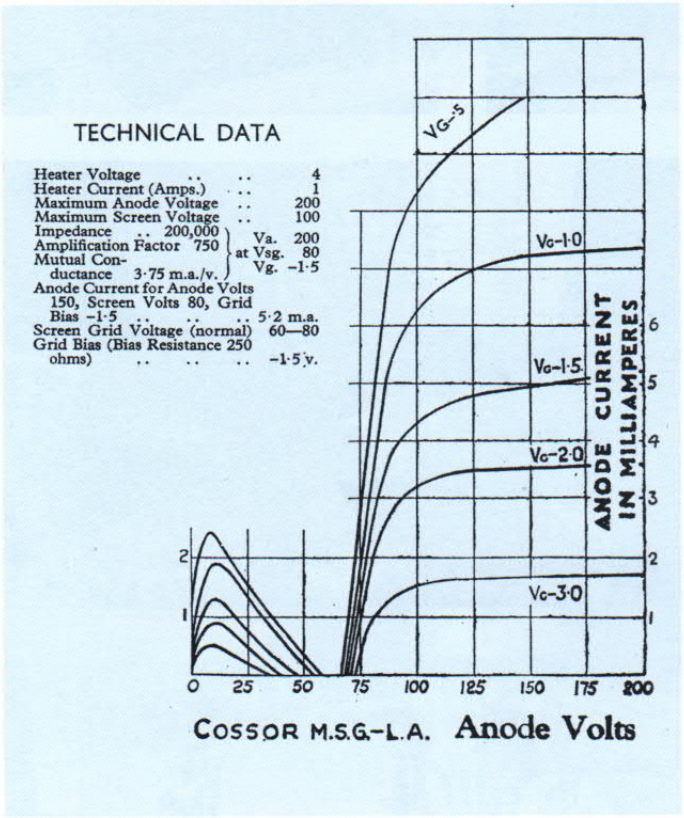


Figure 1

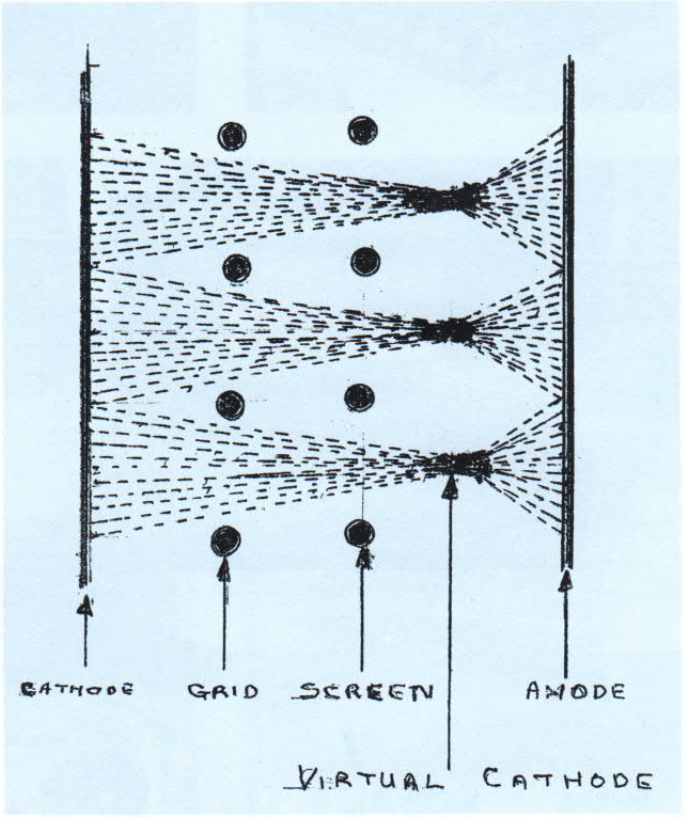


Figure 2

I decided to write a short monograph which, as usual with my offerings to the BVWS is aimed at a wide readership and as is usual in such articles is less than a rigorous treatment of the subject. I trust that some may find it useful.

The story starts with the screened–grid tetrode which was developed to minimise the anode to grid capacity by interposing an electrostatic screen at HF earth potential. The screen was so effective that it prevented the field from the positively charged anode from penetrating to the grid. Thus electrons passing through the grid having no anode field to act upon them went no further. The cure of course was to put a positive bias on the screen to help the electrons on their way to the anode. The resultant device was a great success, revolutionising HF amplification, but it had a serious problem: the tetrode kink, which rendered it unsuitable for large signal handling (power amplification).

The problem was caused by anode secondary emission. Any thermionic valve operating at an anode potential above 10v emits secondary electrons from the anode as a reaction to the bombardment by primary electrons from the cathode. These secondary electrons are attracted to the most positive electrode which in the case of diodes and triodes is the anode. If all the secondary electrons emitted by the anode return to it, the net secondary emission current is zero therefore we cannot detect any effect.

In a tetrode we have a second positively biased electrode (the screen) which also attracts secondary electrons. If all the anode secondary electrons do not return to the anode, the net anode current is the number of primary electrons from the cathode minus the number of secondary electrons captured by the screen thus the anode current falls, producing the tetrode kink (see figure 1). As the dynamic anode voltage swings down following a signal, a point is reached when the almost constant anode current begins to drop very rapidly. When the anode potential approaches the screen bias the anode current begins to drop very rapidly. When the anode potential is less than the screen bias the screen is the most positive electrode and collects virtually all the secondary electrons and since at an anode potential of 40 or 50v these can outnumber the primary electrons, the net anode current can fall to zero and even go negative.

Clearly the screened grid valve has its anode excursion limited to less than the difference between anode and screen supply potentials and since screen bias is typically 2/3 anode supply or higher, large signal swings are not possible. The obvious answer was to introduce a third grid connected to cathode and placed between screen and anode to repel secondary electrons back to the anode, thus suppressing the secondary emission effects. This is of course a pentode – a very succesful power

amplifier, but not the best solution.

There are other ways to force secondary electrons back to the anode. Valves have been produced with very wide anode–to–screen spacing so that the screen potential has little influence upon secondary electrons while they are still close to the anode. Another approach is to add projections to the inner surface of the anode, but a side effect of the virtual cathode produced in the beam tetrode makes it superior to all other forms.

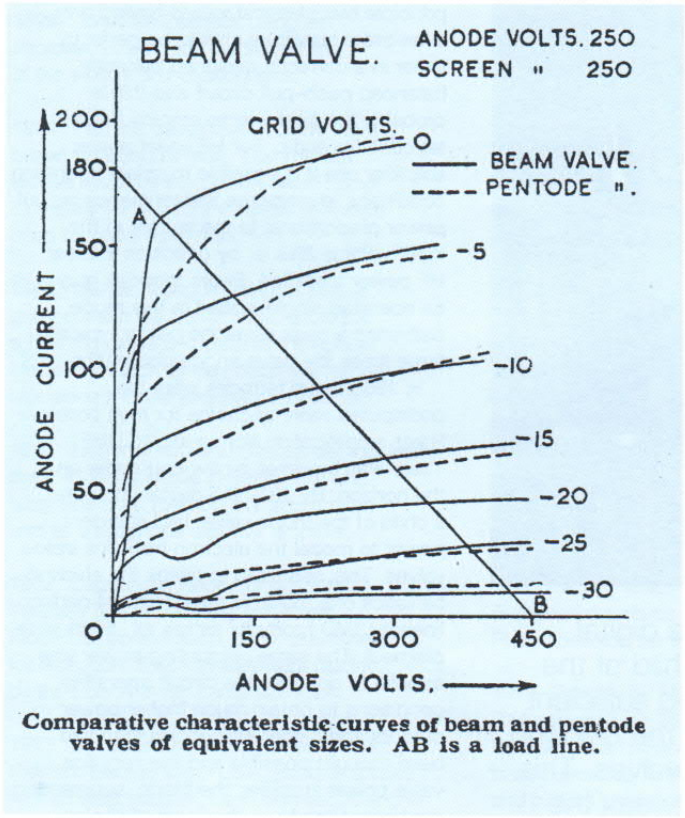
The beams, which give the beam tetrode – whatever its form of construction, is that the grid and screen are helices wound to exactly the same pitch and assembled so that corresponding wires in grid and screen are precisely in line. Thus each screen wire sits exactly in the electron shadow of the corresponding grid wire. The electric field between grid and screen compresses the electrons passing between the grid wires into flat sheets. These are the beams which give the device its name. The electrons passing through the grid and screen are squeezed together until somewhere between screen and anode they reach a limiting density determined by the mutual repulsion between electrons which limits how tight you can pack them. Beyond this point of maximum density, the electrons are little influenced by grid and screen and quickly spread out into a fairly uniform cloud (see figure 2).

The beams, which give the beam tetrode its name are flat sheets of electrons which pass betweeen the grid and screen wires on their way to the anode.

Focussing the electrons into flat beams has three important effects. Very few primary electrons are captured by the screen compared to a pentode where the screen current may be up to 20% of the anode current. In a beam tetrode it is only a few percent. At the point of maximum electron density, shown as the dark wedges in line with the spaces between the screen wires, the conditions are like those at the surface of a space charge limited cathode where mutual repulsion prevents further emission. In three dimensions these spots of high density electrons form a helix with the same pitch as the grid and screen. This produces a virtual suppressor grid but if that were all, beam tetrodes would be little different to pentodes.

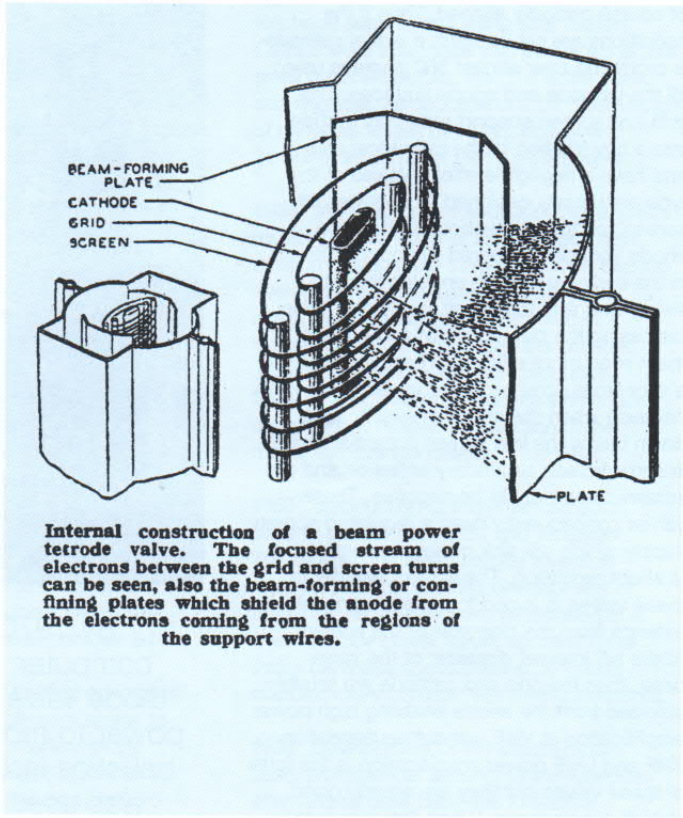
Viewed from the anode, the electrons appear to come from a cathode located between screen and anode. At low anode voltages the device functions like a space charge limited diode. If you carefully measure the initial rise in anode current from zero it exactly fits the three halves power law of a diode. At quite low anode voltages this diode characteristic abruptly switches to the near constant current characteristic of a pentode making a very sharp knee. This enables beam tetrodes to provide low distortion amplification over much more of their anode characteristic than a similar size pentode, and to operate with high efficiency and produce more output power (see figure 3). This made beam tetrodes preferred devices for audio and radio frequency power applications. So why use beam confining plates? In the 1930's the preferred construction for high–powered valves used an electrode section in the form of flattened tubes. The anode tube was supported at the ends of the long sides by rods sealed into the glass pinch at the tube base with grids of similar form with wires welded to support rods, with the ends fixed in place by mica support plates. The problem was that the necessary conditions for proper operation of the virtual cathode could only be obtained over the rectangular centre part of the assembly. The solution was to fit metal plates inside the curved ends of the anode tube to prevent electrons passing through the curved ends of the grid and screen from reaching the anode (see figure 4), hence beam–confining plates. Some texts say that the grid and screen support its name are flat sheets of electrons which pass betweeen the grid and screen wires on their way to the anode. They are not formed by the so–called beam forming plates which were put into early forms of the device to enable established methods of grid and screen production to be used, so avoiding the cost of new tools and assembly techniques for one specific valve type. The confusion began when these plates called 'beam confining' plates began to be called 'beam forming' plates in post WW2 publications and for some reason this misnomer was universally adopted. The potential for misunderstanding was compounded when the same publications began to say that the unique properties of beam tetrodes came about from the formation of a virtual cathode, (which is true), without saying what the nature of the virtual cathode was, how it is formed or what it does to the valve characteristics.

The defining feature of any beam tetrode



Comparative characteristic curves of beam and pentode valves of equivalent sizes. AB is a load line.

Figure 3



Internal construction of a beam power tetrode valve. The focused stream of electrons between the grid and screen turns can be seen, also the beam-forming or confining plates which shield the anode from the electrons coming from the regions of the support wires.

Figure 4

rods caused problems but I doubt that these were major because they only interact with a tiny fraction of the total cathode emission. This form of construction gave devices with significant advantages over pentodes of similar size, but as you can see the introduction of beam–confining plates means only a fraction of the anode and cathode surfaces do any useful work. The valve in this form achieves only a fraction of the potential of the beam tetrode.

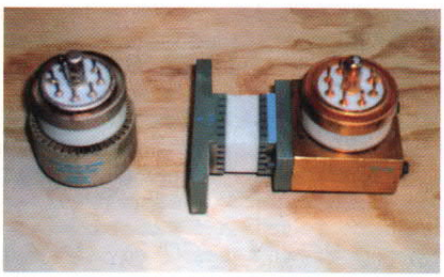
For completeness I suppose I should briefly describe the more modern forms of the beam tetrode. Some may say it is not vintage radio but it predates transistors and I see a lot of them in the Bulletin. In the modern form all the electrodes, cathode, grid, screen and anode form concentric cylinders. The grid and screen wires are of course optically aligned. Thus if the conditions are set up right, a virtual cathode is produced over almost 360 degrees using all the cathode and anode surfaces. The grid and screen support rods only intrude into a tiny fraction of the cylindrical arcs and have a negligible effect. Valves of this type are usually designed to operate with screen voltages only about 15% of the anode voltage compared to about 50% in the early types. This enables them to swing over a much larger anode excursion increasing the power output and making them even more efficient. These valves have a very small screen current usually near zero, because when the anode is swung right down below the low screen potential, there is some screen secondary emission and the screen current could be negative. These valves consequently need a regulated screen supply which will sink or source current, (a shunt regulator). The screen cylinder in these valves is joined to a metal cone which extends from the diameter of the screen to the full internal diameter of the valve base, thus the grid and cathode are totally shielded from the anode enabling high power amplification at VHF without neutralisation. VHF and UHF power amplification is the forte of these valves but they are equally good at high power audio. When they appeared towards the end of WW2 the existing older types continued to be used for anode dissipations up to about 25W and scaled up to about 40W (KT88 and TT21). The new design was used for a series of valves with anode dissipations from 65W to 1KW in glass bulbs and with external anodes for air conduction cooling from 250W upwards to multi KW types with water cooling.

Compare the late 1930's classic type 807 with a rectangular anode and beam confining plates which uses only about 1/3 of the anode area to give a maximum dissipation of 25W and a maximum frequency of 60 MHz with the post WW2 QY3/125, with a cylindrical electrode assembly without beam confining plates of a similar size to the 807 electrode assembly. (The large rings round the outside of the QY3/125 anode cylinder are heat radiators). This valve has an anode dissipation of 125W with full ratings up to 120 MHz. As an audio power amplifier, a pair will produce an output power of 550W at an anode efficiency of 72.5%.

In the external anode form, the electrode cylinders were continued as metal tubes to the outside of the valve and were designed to connect directly to VHF/UHF coaxial anode and grid circuits; this gave them UHF performance up to 1000 MHz and high power up to many KW in a physically

This valve has an anode dissipation of 125W with full ratings up to 120 MHz. As an audio power amplifier, a pair will produce an output power of 550W at an anode efficiency of 72.5%.

By 1970 the digital computer, a child of the triode valve, had sufficient power to model the electron ballistics inside valves. This was used to tweak the electron ballistics of a triode to give it almost perfect linearity, IMD products as low as -50db were claimed).



small size. Two of the smallest members of this family are shown, one air–cooled and one conduction–cooled, having an anode cylinder 1/2" inside diameter, giving a dissipation of 250W up to 500 MHz or 600W audio for a pair. By 1960 the makers data had dropped the name 'beam' and all were referred to as power tetrodes, there being no other type of tetrode capable of power amplification and the beam confining plates disappeared from the circuit symbol as they had from the inside of the valves.

Having extolled its virtues I will probably get taken to task if I fail to mention its major defect. If the transfer function of a beam tetrode power amplifier (the law connecting input signal to output) is examined it exhibits pronounced even order curvature. This implies that at full output considerable even harmonics of the input frequencies will appear in the output. Dealing with this by applying heavy negative feedback greatly reduces the devices' very high sensitivity, one of its virtues. The ultra linear connection which may be considered as anode to screen negative feedback, yields lower distortion for some loss of sensitivity. In principle two identical valves having only even order curvature should be perfectly linear in a correctly designed perfectly balanced push–pull circuit and this is probably the best way to employ beam tetrodes for audio. For HF linear power amplifier use it is possible to select operating conditions to make the instantaneous output power proportional to the square of the input voltage (this is by definition a linear HF power amplifier). Beam tetrodes may be operated single–ended in this mode, delivering a peak envelope power typically three times the valve anode dissipation.

In 1965 beam tetrodes were the undisputed valve of choice for high power linear amplification from audio to UHF. There was however, a new contender on the horizon. By 1970 the digital computer, a child of the triode valve, had sufficient power to model the electron ballistics inside valves. This was used to tweak the electron ballistics of a triode to give it almost perfect linearity, IMD products as low as -50db were claimed). The same computing power was applied to optimise the circuit operating conditions to obtain much higher power outputs and higher efficiencies than had been thought possible and the very first valve power amplifier, the triode, superseded the beam tetrode as the valve of choice at any frequency up to 1 GHz. The same computer modelling applied to 1930's power triodes like the 811A, by radio amateurs, enabled them to produce twice as much power at much higher frequencies than their designers thought possible. 70 years old, the triode finally reached its potential. The tetrode, invented to overcome the limitations of the triode, had its limitations overcome by the return of the triode.

Cathode Ray Tubes and Thermionic Valves: Some key years

by Phil Taylor

1883 Edison patents a voltage indicator, a carbon lamp with an anode. Edison observed conduction from the negative side of the lamp filament to the positively charged anode.

1889 JA Fleming experiments with an Edison effect lamp brought over from the USA by William Preece, a Post Office Engineer.

1897 Ferdinand Braun develops a practical version of JJ Thomson's cold cathode tube. Braun's tube has a fluorescent screen.

1899 Jonathan Zenneck using an improved Braun tube displays some of the world's first oscillograms.

1904 Fleming develops the diode valve based on Edison's work. Commercial diodes made by the Edison Swan Lamp Company for Marconi Wireless Telegraph used for radio wave detection.

1908 Lee de Forest in the USA puts a grid between the filament and anode of a Fleming diode and patents the Audion triode. Research by de Forest was aimed at making a better radio wave detector.

1911 Lieben, Reisz and Strauss demonstrates the LRS Relay Triode in Berlin. The LRS relay was used for radio communication and as a telephone repeater amplifier.

1912 Captain HJ Round of Marconi Wireless Telegraph develops Round triodes for transmission at low power and for reception. These triodes were made by the Edison Swan Lamp Company.

1913 Development of the Audion triode by Western Electric in the USA results in a valve with a better vacuum, used with negative grid bias, to achieve stable amplification for long distance telephone repeater amplifiers. Western Electric valves used oxide coated cathodes.

1914 Development of the White Triode at Cambridge. Like the original Audion, the LRS Relay and the Round Triodes, the White valve did not have a hard vacuum. French manufacturers develop the TM triode, based on Audion samples brought over to France earlier. The TM valve had more efficient co–axial electrodes and as hard a vacuum as could be commercially obtained.

1916 UK valve manufacturers prepare for mass production of the TM triode.

1917 High power transmitting triodes developed for the Admiralty by GEC.

1919 Formation of the Marconi Osram Valve Company, later MOV. This was a joint venture between the Marconi Wireless Telegraph Company and GEC. Start of the development of the Western Electric 'N' valve, later coded 4215A. This was the first miniature valve. Sold in the UK by Western Electric and STC. Sold by Mullard as the Weco valve.

1920 Discovery in the USA of the thoriated tungsten filament, a more efficient electron emitter than pure tungsten. The new filament quickly adopted by most valve manufacturers and as it required a good vacuum, magnesium flash gettering came into use. Ordinary receiving valves with pure tungsten filaments continued to be made throughout the 1920's and transmitting valves with tungsten filaments made for many years after that.

1924 Cossor and Cosmos (Metropolitan Vickers) manufacture oxide coated dull emitter triodes. Western Electric market the gas focus CRT 224A, one of the first practical CRTs for oscilloscope use. Made by STC in the UK as the 4050. These tubes were directly heated and had filament ratings of about 0.75v

1927 More or less simultaneous development of the screened grid amplifying valve by MOV in the UK (S625) and GE in the USA (222). MOV develop early indirectly heated valves using space as the insulating medium between the tungsten filament and the coated cathode. EY Robinson of the Cosmos valve company develops a slip coated heater–cathode assembly which is quickly adopted worldwide as an industry standard. These early indirectly heated valves had 4v 1 amp ratings which became British and European standards throughout the 1930s. Philips develop the first power pentode B443.

1929 Release by MOV of the first generation PX4 power triode. Electrically very similar to the Telefunken RE604 and made with the barium process. Unified ranges of mains and battery triodes, marketed standardised envelopes, anode and filament or heater assemblies. Varying the grid pitch makes valves with high, medium and low amplification factors. Mazda markets the first indirectly heated audio power pentode, the AC/Pen.

1930 Cossor make the first RF amplifying pentode MSPenA. This type was little used.

1931 Marketing of amplifying pentodes in the USA by Arcturus and Speed.

1932 Introduction of the 6.3v heater rating in the USA, originally made for car radio valves. First variable mu RF amplifying pentode marketed, the type 39.

1933 Development by a team at EMI of the aligned grid beam tetrode power valve as competition to the Philips–patented power pentode. MOV make several hundred samples but do not mass produce the valve. Type number assigned is N40, electrically similar to the MPT4 pentode. The idea passes to RCA, who make the 6L6 in 1936 as the first beam tetrode first marketed. Tunograph tuning indicator introduced by STC, a simple form of CRT in a valve envelope. Not used commercially.

1934 Development in the USA of the acorn valve. This valve had very small electrodes, short lead–out wires and was more efficient at low VHF frequencies. Sale by Hivac of critical distance tetrode power valves as competition to the Philips pentode. Sale of Catkin valves made by MOV. These valves had external copper anodes, a steel and mica clamp as electrode support and a ring seal. Battery Catkins were also made with conventional, but small glass envelopes, with the same clamp and ring seal. Introduction of a complete range of miniature valves by Hivac, initially with 2v filaments and later with 1.5v filaments.

1935 Introduction in the USA of the all–metal receiving valve. Most of initial 9 types were existing designs with steel envelopes. Fernico eyelets were initially used for lead–out seals, later replaced by a glass biscuit. It is likely that MOV's glass Catkins provided some inspiration for the RCA product. Steel envelope American valves were made in Japan and Russia. Introduction of the magic eye tuning indicator in the USA.

1937 Introduction of the American octal base to the UK from MOV and Tungsram. The aligned grid beam tetrode invention returns to the UK with the development of the KT66, an up–rated and redesigned 6L6. Beam tetrode power valves adopted by all major UK makers. Introduction by British manufacturers of magic eye tuning indicators.

1938 Development of the Mazda octal base, promoted as superior to the American international octal base due to shorter lead out wires from the valve electrodes. Sylvania market the first all glass loktal valve, a valve with a locking spigot system and short pins directly connected to the electrodes without using a pinch seal.

1939 Announcement of the first European all–glass valves of similar style to the Sylvania design, the Mullard–Philips EF50. This had 9 pins rather than 8 and the valve was fitted with a close fitting aluminium can. 9 pin B9G valves subsequently made by MOV. Announcement by RCA of the first all–glass 7 pin miniature valves, a range of 1.4v filament battery types to make a superhet receiver

1940 The British valve industry comes under the control of the Ministry of Supply. Valve makers were allowed to manufacture a limited range of consumer types, as much production went to the war effort. Many types were made obsolete and were not reintroduced subsequently. Valve makers sold valves to each other for re–branding, thus padding out their sales lists. New

Continued on page 43

A Swapmeet across the Pond

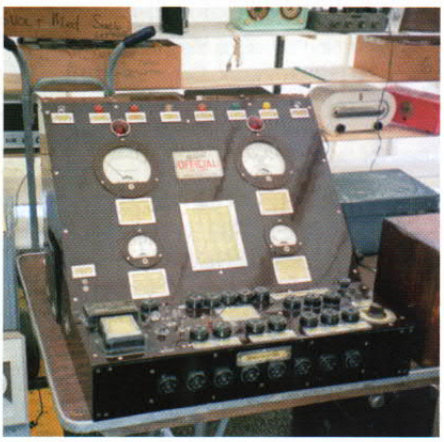
By John Howes

When the opportunity arose to visit a vintage swapmeet in the USA last Summer, Phil Taylor and myself leapt at the chance. The Michigan Antique Radio Club organises this three day event in conjunction with the Tube Collectors Association at the Holiday Inn, Lansing, Michigan. Last year was the club's 22nd annual event and took place between Thursday 12th to Sunday 14th July. Every year their 'Extravaganza' has a theme and on this occasion it was 'performance radio', which was an added bonus for me.

On Thursday whilst still feeling jet-lagged, we attended the Tube Collectors meeting and swap which was in one of the hotel's meeting rooms. The variety and obscurity of some of the valves was quite amazing to me, also the enthusiasm shown by the collectors present was infectious. Registration took place under a huge marquee in the car park at 6.30am eager to see what goodies were for sale at the swapmeet. Free donuts and coffee were available. Selling at the meet is not allowed before 7am and all items have to be covered or not displayed until this time.

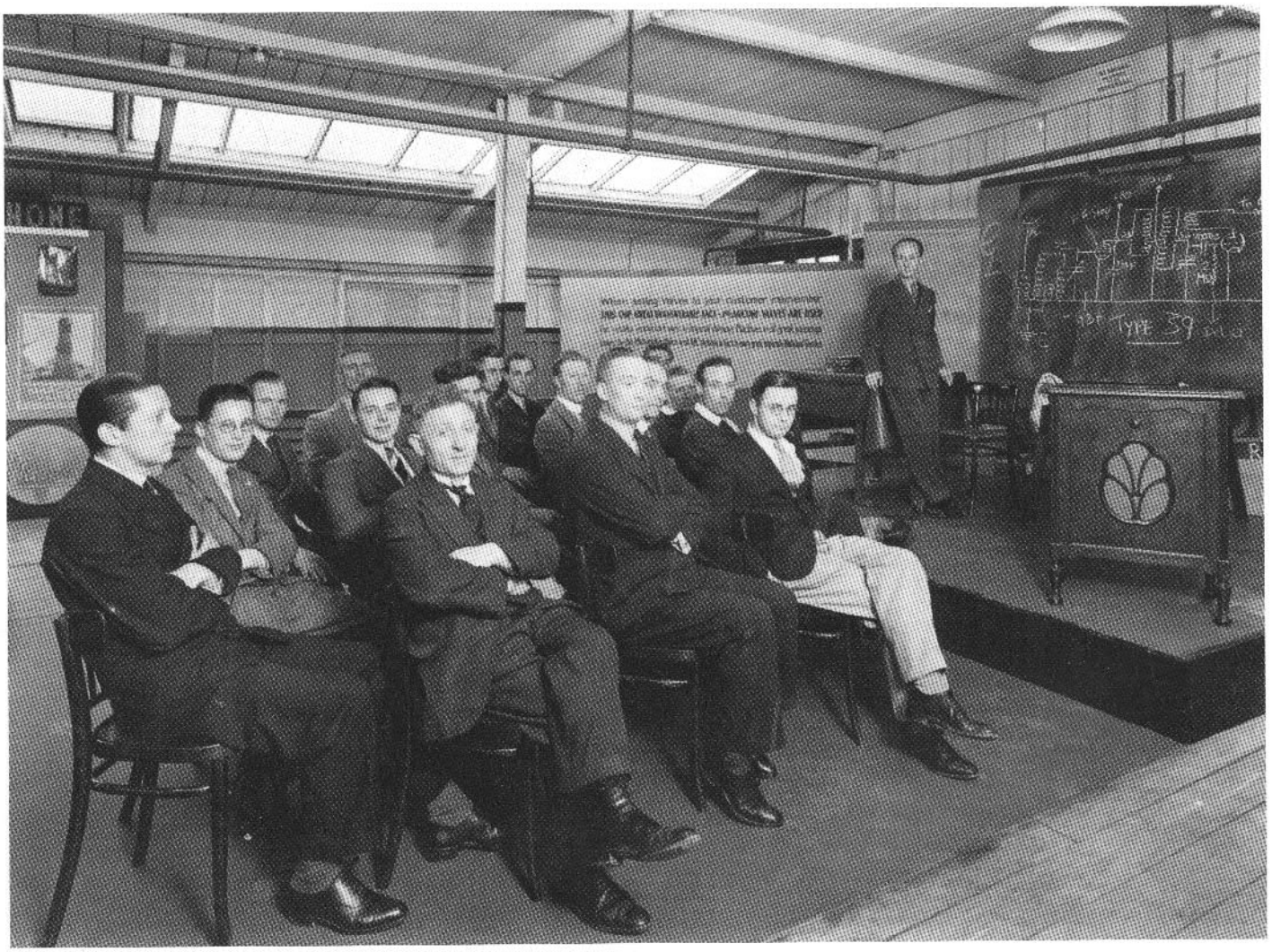
We were not disappointed with the range and quality of equipment being offered, ranging from crystal sets to large consoles. Between 1 to 2.30pm Ludwell Sibley gave a talk on 'Tubes, the stuff RCA didn't tell you', which both Phil and I attended. This gave a fascinating insight into a giant of the radio industry in America. Ludwell's knowledge of RCA valves and patents is awesome! I never knew that RCA were considering producing a 2A3M with a metal envelope.

Also arranged in the day was a 'check-in' for the radio contest and exhibition that was to be held in the evening. From 7.30pm onwards in the ballroom all the contest entries and special exhibits were being displayed. Live music and a large free buffet had been organised, which rounded the day off perfectly.



On the Saturday, the main swapmeet took place in the car park and under the marquee once again. Mid-morning Mike Dale gave a very interesting talk on 'The 6SN7 and its variants' back in the hotel. Between 2-5pm in the Ballroom, Richard Estes auctioned several hundred radios, valves and related items which was a very busy affair. Later in the afternoon a bargain radio auction was held in the marquee.

In summing up, I thoroughly enjoyed 'Extravaganza 07' and must pay tribute to the professional organisation of the whole event. If you ever get a chance to attend, you should go - you won't be disappointed.



Above: previously unpublished photograph showing a class being taught at the Marconiphone Dealer Training School, Dagenham, 1931

Below: previously unseen photograph of shop display in 'Schoolbreds' Tottenham Court Road, London. Photographs kindly loaned by Tony Bottrill.

Before

After

Top: Before. Above: After

Put away that varnish stripper

By: Tim Voore.

The decision to re-polish a vintage radio cabinet must always be one of last resort. Even the most skilled woodworker does not always find it easy to achieve a finish that is appropriate to the object. Where the polish has perished so much that it is flaking off, re-polishing is inevitable. If however the adhesion is still firm, but the surface is faded, scratched and water stained, it may still be possible to make a near miraculous improvement to the finish by applying a suitable reviver. But does such a substance exist? The answer is yes, in the most unlikely of forms. A substance that has near magical properties as a polish reviver, is the old fashioned laxative Liquid Paraffin, prescribed for the temporary relief from constipation. It is most effective on cellulose finishes, but also works on the majority of French polished surfaces. Still available from many non-chain pharmacies, it is an odorless, tasteless, clear oily liquid. If an industrial chemist had been given the task of designing a polish reviver, he could not have done better than Liquid Paraffin. In order to understand why this substance is so effective, consider what appears to happen when a polished surface ages:

Time and exposure to UV light causes the polish to become brittle and porous. Whilst always susceptible to water damage, which leaves unsightly white marks, the problem gets worse as the porosity increases. With brittleness comes increased sensitivity to scratch and bruise damage. Eventually the polish loses all adhesion and flakes off at the lightest touch.

Application of Liquid Paraffin will restore the flexibility of the polish and significantly reduce the porosity, whilst appearing to have no effect on the adhesion of the polish to the underlying wooden surface. Some initial darkening of the surface takes place when the reviver is first applied, but once the porosity has been reduced no more reviver will be absorbed. You will therefore not continue to darken the wooden surface by further repeated application of reviver. Because of this initial darkening, badly sun-bleached and faded surfaces are much improved. *But beware*, the faded look is considered a desirable "patina" on some antique furniture, and if this is the case, Liquid Paraffin should not be used. This substance will eliminate most white water stains. When the reviver has no effect on such a white stain, the damage is almost certainly due to heat rather than water. In such a case the offending area will have to be coloured in to disguise it. The images above show the effectiveness of the reviver on the cabinet of a 1933 Pye Cambridge receiver.

Applying the reviver to a cabinet.

Very carefully clean off any surface dirt with a damp soapy cloth, and immediately dry it thoroughly. In case the cabinet has been polished with a wax polish, clean the surface with white spirit, again drying thoroughly. Using a lint free cloth pad, apply the Liquid Paraffin and leave to stand for about an hour. If the treatment is going to be effective, you should already see evidence of this at the end of this period. Give the cabinet a further application of reviver and leave for about three hours. After this time, give a final application and leave for 24 hours. At the end of this period whatever improvement is possible will have taken place, and you should wipe off any surplus Liquid Paraffin. After about three weeks the Liquid Paraffin at the polished surface will have oxidised and the cabinet should be dry to the touch. Re-examine the cabinet about three months after treatment. If there is any sign of deterioration, repeat the process one more time.

Colour matching damaged areas, and dealing with Metamorism.

Scratched and bruised areas, and surfaces that have been water damaged, are more porous than adjoining polished areas and so they will end up darker after the application of the reviver. If these areas are sufficiently large to be unsightly, together with any white heat damaged patches, they will have to be repaired by touching in with artists oil colours. Artists oil colours have the advantage of being very slow in drying, and therefore if the initial colour match is unsatisfactory, it can be easily removed with white spirit.

We view the majority of objects by reflected light and the observed colour depends on a combination of the spectral makeup of the object being viewed and the spectral distribution of the illuminating light source. This means that two different objects which colour match in, say daylight, will look different in tungsten (light bulb) illumination, and probably dramatically different in fluorescent light with its discontinuous spectrum.

This effect is called Metamorism and is a nightmare problem for television costume designers and restorers of oil paintings. Establishments such as the National Gallery, with access to hi-tech spectrum analysis equipment, can mix the repair pigments to give a perfect match to the original surface, thus achieving an invisible repair in all forms of illumination. The best we can do freehand is to use the minimum number of colours to achieve a match, do the initial matching in bright daylight and then check the match under tungsten illumination. If the match is poor, start again until a good balance is achieved. Accept the fact that the repair will not match under fluorescent lighting. Allow the oil paint to dry. (This can take up to several weeks). Then apply a thin coat of protective polish.

Sensible precautions.

I have been using this technique for many years, and most of the items revived 12 years ago have remained in excellent condition without any further deterioration. Very few have needed a repeat application of reviver. The technique has been successful in about 90 percent of cases. Some surfaces have however not responded at all, but never once has any adverse reaction occurred due to the application of this substance. *Nevertheless* there is bound to be an exception, and therefore before fully applying the Liquid Paraffin to the cabinet, test it on an unimportant part to make sure that no adverse reaction results.

If repair is required to the cabinet veneer, do not allow the Liquid Paraffin to come in contact with the bare wood in case glue adhesion is affected.

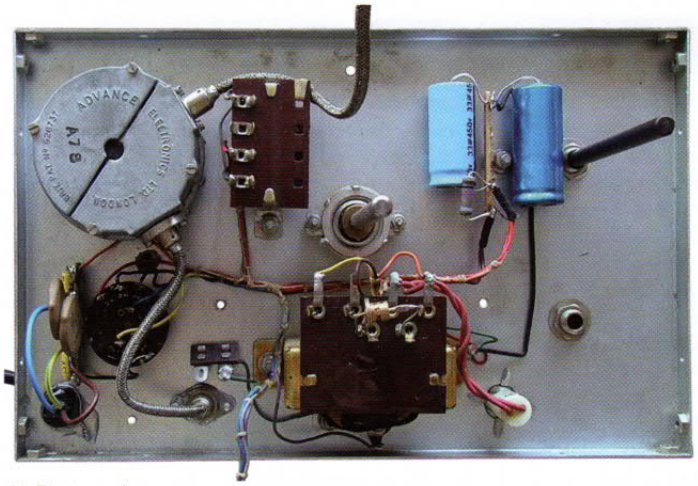
Repair of an Advance Signal Generator SG62B

by Gary Tempest

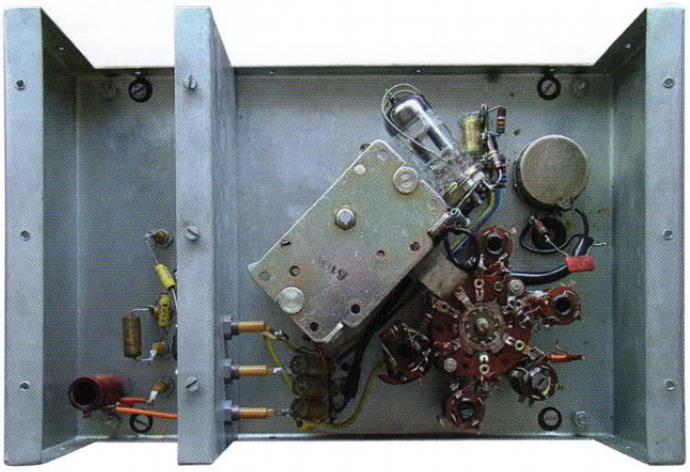
I bought this instrument for a few pounds at a Harpenden auction. It had obvious mechanical problems: the cover was missing that provides a graticule for the dial markings and the waveband knob slipped around without turning the switch.

1: Advance SG62B signal generator

2: Looking inside (calibration details tucked in the back)



3: Front panel rear



4: Inside the oscillator electronics box

It covers an amazing (well to me anyway) 150 kHz to 220 mHz in six ranges with or without AF modulation. I particularly like the small size, only 11 inches wide, as it takes up minimal room on the bench.

Mechanical construction

Advance made quality instruments and this one was no exception. Basically, as can be seen in pictures 2 and 3, it has the simple power supply (silicon diode), the AF modulation transformer, the coarse attenuator and the two speed epicyclic drive, to the tuning capacitor, mounted on the rear of the front panel.

At the rear it has a vertically mounted metal box to house the oscillator electronics. Screening integrity is excellent as the control shafts pass through it and the power and heater supply are via feed through capacitors. Once inside the box it is found that all functionality is achieved with one double triode valve. As can be seen in picture 4 the box is split and the smaller compartment contains more filtering components for the heater and HT supply as well as the capacitor for the modulation oscillator. Also to be seen in this picture is the fine attenuator potentiometer, RV1 on the circuit diagram.

The circuit diagram

No need to redraw this one as it is easy to follow and taken from the excellent service manual. V1b is a Colpitts type oscillator with associated components for the switched RF ranges.

V1a is a Hartley type oscillator with components "T1, C9, R16, R17 etc" for the modulation oscillator.

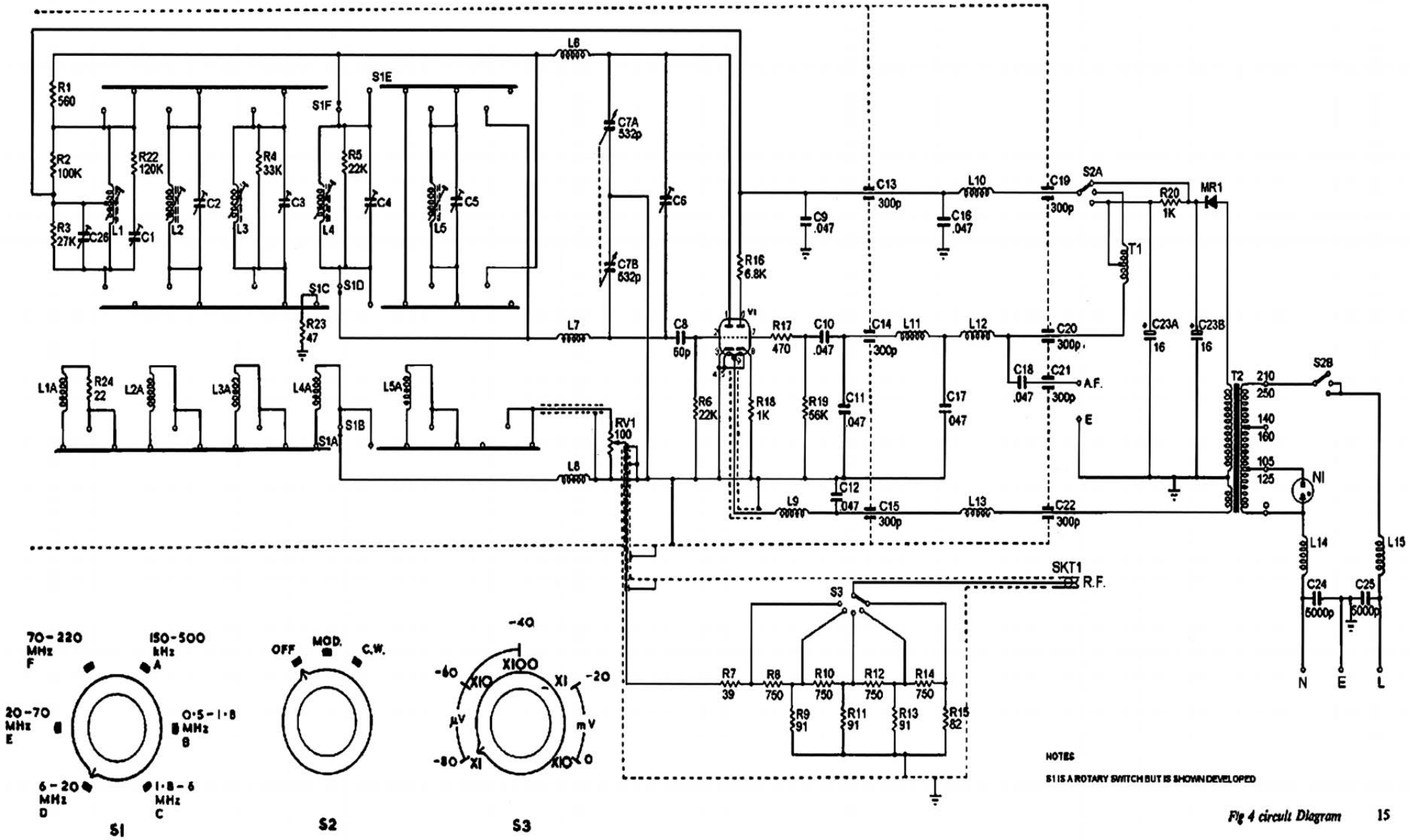
In CW operation, part of T1 is not in circuit so the modulation oscillator is non- functional. HT is only fed to the RF oscillator.

In modulation mode the HT supply is fed to the anode circuit of V1b via the auto- transformer T1. Since T1 forms the anode to grid coupling for the modulation oscillator, the HT supply to the RF oscillator will vary with this signal. The output available at the RF socket will be the selected RF signal amplitude, modulated at 400 Hz to a depth of approximately 30%.

Fixing the problems

I couldn't make a new dial cover that clipped on like the original so I cut a disc from 2mm acrylic sheet. This is difficult to cut and can splinter very easily but the tool I used was a hand operated "Laser"

Article continued on page 42 (circuit on opposite page)



NOTES

S1 IS A ROTARY SWITCH BUT IS SHOWN DEVELOPED

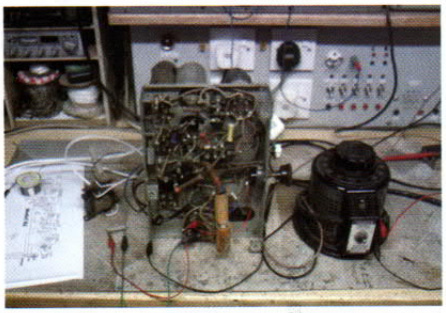
Fig 4 circuit Diagram 15

Philco 84B chassis headache

By Colin Wood

Rough but original

Sum of parts



On life support

Repainted

Refit underway

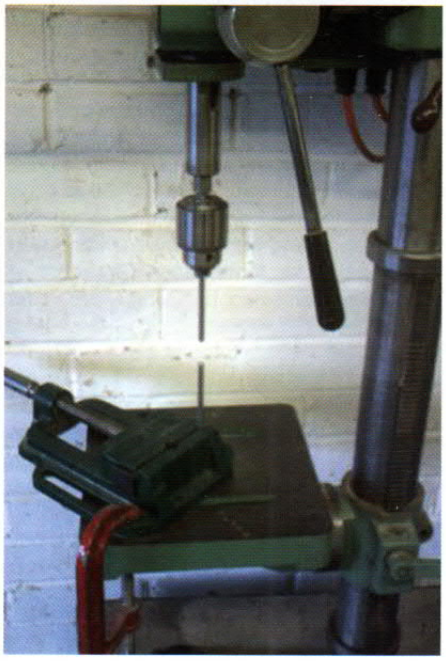
Rewound and wax dipped

Having completed a full restoration of the cabinet, work started on this Philco 84B chassis on 5 January 2008. Being only a four valver it should have been an easy project to complete. The chassis whilst looking rough was very original apart from two electrolytics which had been soldered directly to the original can. This was going to be a strip to the bare chassis but before doing so I decided to get it working first. It was a simple matter to replace the capacitors which were encased in Bakelite blocks. Each block was removed in turn, heated with a hair drier and the originals pulled free having snipped the leads at the tags. The tags were then cleaned and new modern capacitors were installed and soldered in place, checking connections against the circuit diagram which had been a free download from Nostalgia Air. The original electrolytic can was removed and polished then it was cut near its base allowing the innards to be removed and new modern electrolytics to be inserted. Most of the resistors were well out of specification so were replaced with modern components. A new mains lead and plug fused at 3A was fitted ensuring live was broken by the on/off switch. The speaker needed a recone so couldn't be used and as it contained the field winding a heavy duty 960 ohms resistor was installed to replace the winding, allowing the chassis to be connected to the workshop permanent magnet speaker.

The mains transformer was wired for 115 volt use only so to put some power into it a Variac was used, winding the voltage up slowly. At 80 volts nothing was happening: this was due to an open circuit wire–wound resistor, No.30 on the diagram. The resistor was replaced then again power was applied. Now there were signs of life. As the set wasn't showing any stress, voltage was increased to the full 115 volts. Stations could be tuned in but on low volume only with a loud hum. The low volume was traced to No17 compensator (trimmer); its fibre adjusting nut had worked loose in transit. One of the Philco websites gave the answer to the hum. One of the eyelets used to secure the screening can's base and No.2 valve holder to chassis also has a ring connector attached to it. This ring connector is prone to coming loose as it had in this case; touching it with a screwdriver totally cleared the hum. It's always wonderful to hear a set burst into life for the first time in many years and this Philco sounded well. Power was left on for a couple of hours to let it warm up before switching off.

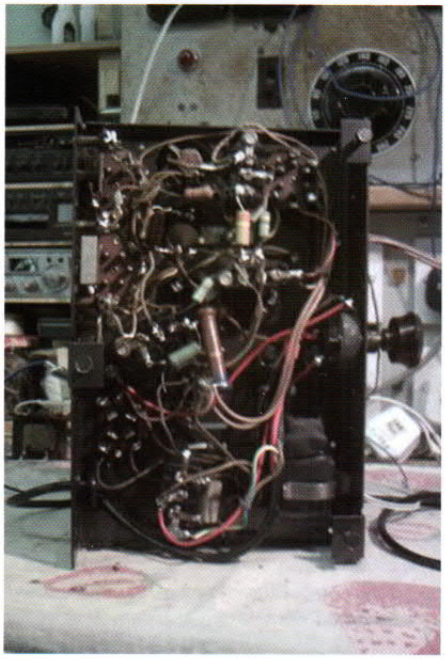
I had done one full chassis strip previously which took many hours to accomplish. To make life easier this time, the components above chassis were marked and noted with sketches before removing but leaving the three tuning coils still connected as they could be pulled through from below chassis with care. The eyelet securing the first tuning can was drilled and an attempt was made to remove the can but it refused to lift clear. Tipping the chassis over, there were no other obvious means of it being secured which was a bit of a puzzle. The eyelets were then drilled from the other two cans and all three cans could then be lifted clear; they were spot welded together. The aerial and oscillator transformers looked in good clean condition but I was amazed at the condition of the IF transformer, it looked like something out of a horror movie. It was covered with a coating of what looked like crystallized ginger and spider's webs. The rest of the components were released and removed as one complete assembly, taking care not to damage the tuning coils as they were withdrawn, paper had been wrapped around these coils and secured with rubber bands to be on the safe side. This assembly was placed out of harm's way, then a start was made at rubbing down the chassis with abrasive paper; 60 grit paper was used for speed, to remove the deep rust patches leaving a bright metal chassis ready for painting. The weather was terrible as usual, torrential rain, high winds with much flooding leaving many people homeless. The chassis was placed in a plastic bag to keep it dry then carried into the garage where it was sprayed with grey undercoat using a spray can. Whilst the undercoat was drying a trip was made to our local car accessory shop to purchase suitable paint for the top coat. Looking at the racks of spray cans, the silvers didn't look right. Undecided which colour to choose I was looking out of the window at the rain lashing down which made my mind up. I colour–matched the sky and chose Rover Stratos; a dark grey. With the grey gloss applied the chassis was left alone for a few days in a warm place to let the paint harden.

The newly painted chassis looked superb and not wanting to scratch it, a tea towel was placed under it on the bench. The IF transformer was sprayed with WD 40 and wiped dry with a paper towel. Then it was very gently scraped with a sharp craft knife to remove most of the rough surface which turned out to be wax. The rest of the components were sprayed with WD 40 and wiped dry, improving their appearance a great deal, then the whole assembly was re-fitted to the chassis,; this part of the job went very quickly taking care once again not to damage the coils. New brass eyelets had been purchased from DPT in Rochdale at a very reasonable cost of £14inc. for 1,000. (Minimum order £10). The eyelets were 1/8" x ¼". I also bought 200 4BA brass round head screws ½" long together with brass nuts, £18 locally, and for good measure purchased 500 1/8" x 5/16" copper dome head semi tubular rivets, £41inc. This selection will last a lifetime. Setting the eyelets wasn't as easy as expected; the depth of the chassis, the screening can holder and the fragile coils compounded the problem. After a



Eyelet punch

Horror movie item

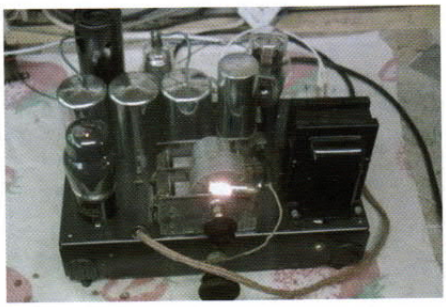


New dropper fitted

great deal of thought a pair of ¼" dia. x 6" long silver steel punches were turned in the engineering lathe. The punches were then mounted in the drill press ensuring perfect alignment, each eyelet was fitted from above the chassis then the chassis was tipped over locating the eyelet on the bottom punch and the top punch was used to set the eyelet. This worked extremely well and made a very neat job. The mains transformer and screening can were painted and the tuning gang was cleaned using wire wool. The tuning gang was blown off with an air line and its bearings lubricated before fitting. New extended leads were fitted to connect the output transformer which was sitting on the bench and also to the workshop speaker.

By now I was very pleased, the cabinet and chassis had come up exceedingly well; all that was now needed was to switch on then put the chassis back into the cabinet adding yet another beautiful set to my collection, life couldn't be better. The chassis burst my bubble big style by declaring a full twelve day war on me. At switch on it refused to talk to me. Thinking the fault would be something simple three days were spent checking connections and components without any luck whatsoever. I contacted Gerry at www.crowthornetubes.com to purchase a spare No.77 valve and explained the problem. Gerry was very kind and replied with a number of suggestions then followed up with a list of very useful websites that contain masses of Philco information. Much time was spent surfing these sites for problems with the 84B. The ring terminal previously mentioned turned up a few times as did a common problem with the tuning coils going open circuit in particular the oscillator coil. A mod was suggested to exchange the No.6 4meg resistor for a 2meg. All three coil units were removed and the aerial tuning primary coil had gone open circuit. Fortunately the primary winding is on the outside and only a few turns of wire are involved making rewinding very easy. Armed with the new information I knew the insulation between the windings was prone to failure causing all sorts of problems so replaced this at the same time. Following the information to the letter I then immersed the entire coil in hot paraffin wax for half a minute, withdrew it and let it dry. Now with the pan of wax cooling the coil was dipped a second time to seal the primary winding with a heavy coat of wax which completed the job. This looked so good and was so easy to do that I decided to rewind the oscillator primary whilst it was on the bench. The oscillator primary has 15 turns and the aerial primary has 21 turns of enameled copper wire. 0.006" thick, (6 thou.) Measured over the enamel. The solder tags were cleaned of wax and the coils were soon refitted to the chassis. At switch on all the stations came in very clear but on low volume. I drilled out the new eyelet on No.2 valve and replaced it with a 4BA brass screw and nut checking for continuity to chassis. The set remained obstinate. I then e-mailed my friend Martin Scobie for advice. Martin spent a lot of time e-mailing suggestions and information on how to use the signal generator and oscilloscope to try to isolate the problem. I spent ages but couldn't get any sense out of the chassis using the generator and scope and by now was getting a bit fed up with the multitude of leads strewn across the bench so decided to have a go at powering the set from the 240V mains supply direct, at least this would get the Variac off the bench. During all this work I had purchased 26 2.2uF 275VAC Class X2 capacitors from eBay at a very good price of £1 for two. I didn't want to rewind the mains transformer as it was highly likely the new windings would not fit the laminations but wanted to retain it if possible to offer transformer isolation to the chassis. I had used capacitor droppers before to replace resistive line cords and wondered if it was possible to add a dropper in series between the on/off switch and the transformer using the Variac to determine the required capacitance. I'd never seen this done before but knew the dropper would only work into a resistive load and as the primary of the transformer was resistive decided there was nothing to lose. I tried a single 2.2uF class X2 starting at zero volts on the Variac and was pleased to get low voltage readings on the chassis with the Variac at maximum so added another 2.2uF in parallel this brought the voltage up much higher and with a pair of 0.47uF class X2 added was absolutely delighted to read 6V on the heaters with 112V on the transformer. This proved a very simple, cheap but effective way to convert this chassis to 240V supply retaining the original transformer. The dropper was encased in heat shrink sleeving and installed below chassis in the bottom right hand corner securing it with a spring clip. This cheered me up a lot and got the Variac off the bench. What now followed was a nightmare, days were spent checking and double checking components, the valves were pulled and tested, all the resistors and capacitors were ok as was the wiring. I pulled the oscillator coil off, swapped the primary leads making a mess of the good work to no effect. This was by now testing my patience to the limit; it's a simple set so why was it giving me so much grief? I was awake at nights thinking about it and couldn't settle as it was on my mind all the time. The weather was lousy, whilst I was trying to listen for signals the wind was howling so much that I had to connect the earphones up, it was very dark with hail, snow and a lot of frost, this was supposed to be enjoyable.

During all this I was gaining a lot of much needed experience, I was surfing the web, Gerry and Martin were both wonderful and I was reading. In one of the books, the section on oscillators gave profound advice



insomuch that if the two coils were considered to be connected as one; the start of the primary would connect to the anode with the finish of the secondary connected to the following grid. With this information the aerial and oscillator coils were once again removed making me wish that they were secured with zips by now. I stripped both primaries ignoring all my previous notes and rewound both. Full of hope I switched on but now had a totally mute set so at least I had now really upset it!! Studying the circuit diagram in bed for the umpteenth time I found my mistake with the coils. I had taken the start of the primaries in each case as connected per the circuit diagram, what I should have done was to use the chassis tag in each case as the start with the other end being the anode and aerial connections. By now I knew the connections off by heart so removed the coils in the knowledge that this would be the last time and rewound the primaries. This time I took a lot of time and with the primary windings and insulation removed both the aerial and oscillator coils were given a good soak in hot wax sealing the secondary windings. With the new primaries wound the coils were dipped in wax as before and then fitted to the chassis. I found a rubber band to be a great help in holding the insulation in place whilst winding. The set still refused to work. At this point it's a good job that a sledge hammer wasn't to hand or I would have surely destroyed this chassis and taken up knitting as a hobby. Staring in disbelief at this chassis smirking at me on the bench I concluded that I had gone as far as possible and all the components on the chassis were tested ok and connected correctly. In desperation I then swapped the output transformer primary connections and was filled with deep emotion as the set almost blew me off the chair with output. What a total idiot I felt. Whilst installing the three new output transformer leads; I had soldered the ends below chassis and as the leads were all the same colour used the multimeter to check each for continuity before connecting to the output transformer, regarding this repair the most important word that will forever live with me is "feedback". I was so certain that the output side of the set was correct that I didn't consider it to be at fault, after all the set was running on low volume so I wrongly assumed everything was connected ok. I can now use Martin's excellent advice and have a go at alignment for the first time, it's aligned by ear as I write and is a good performer. It was worth it in the end.

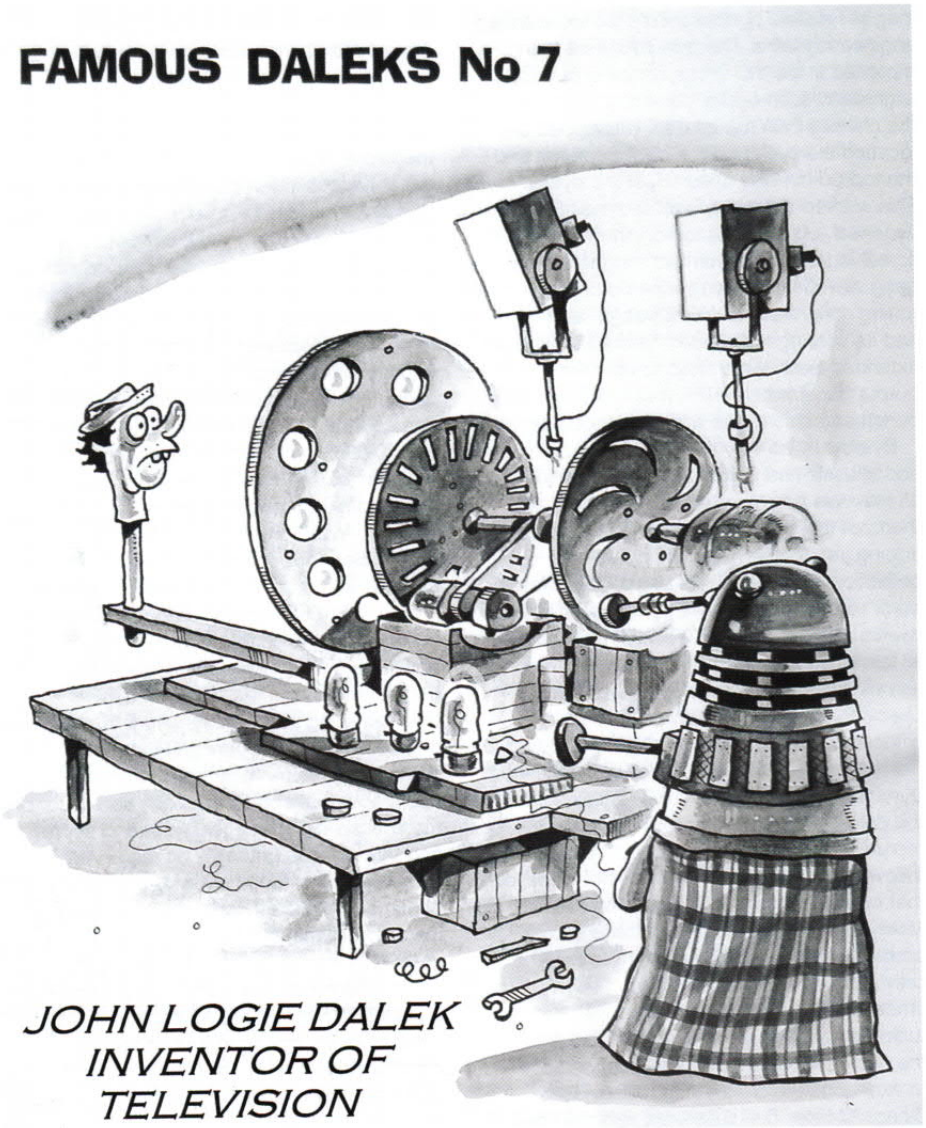
Suppliers and websites used as follows.
Eyelets - www.dtpsupplies.com
Rivets - www.sapphireproducts.co.uk
BA screws & nuts - Tel: 01484 518798 (Danlett, Huddersfield).
Websites - www.philcoradio.com, www.philcorepairbench.com
www.nostalgiaair.org

Television – A Warning From 'History'

Dicky Howett finds a high horse and gets on.

It's an acknowledged fact that in these modern times, most available information, previously reposing quietly and unobtrusively in dusty libraries- can now be obtained (at negligible cost) via the Internet. It's perhaps salutary at this point to offer a Cautionary Tale. This concerns the widespread dissemination of guileless historical television misinformation. Although not entirely blameless myself, any errors I might bestow are mercifully confined to a few hundred select readers. However, not so Web Gaffes. These have the potential to zap the entire globe in milliseconds, causing extreme befuddlement.

Recently, I had occasion to fulminate against the continuing inaccuracies of several website 'television histories'. This dubious



Original illustration by Dicky Howett first published in 'It's Bigger On The Inside' Marvel Comics Ltd. 1988

TV Material, posing as 'fact', continues to litter cyberspace with a host of sites featuring all manner of video themes and arcane technological tub-thumping. Examples abound. One such is the oft-repeated tale that on Sept 1st 1939 the emerging BBC Television service closed for the duration with the sudden and alarming interruption in mid-animation of a Mickey Mouse cartoon leaving viewers with nothing to look at but a screen full of white noise and lots of 405-line 'snow'. This is demonstrable nonsense, easily corrected by reference to the available source material, and yet many books and TV documentaries have, (and continue to) present this Mickey Mouse episode as concrete fact. It was under these trying conditions that I had occasion to berate a Web TV 'historian' for reinterpreting another piece of TV history, namely John Logie Baird's first 'public' demonstration of television.

This TV web tale recounts how on January 26th 1926 Scottish inventor and entrepreneur, John Logie Baird gave in his London laboratory, the first recorded example of 'true' TV. This formative exhibition was mounted for members of the Royal Institution (oft mis-titled, the Royal INSTITUTE) presented as a 'sneak preview' of Baird's successful attempt to transmit half-tone TV images. So the story goes, at one point an injudicious elderly scientist got his 'long white beard' caught in the whizzing machinery. Suddenly, it seems that dear old Santa Claus had invaded the proceedings.

I opined that this 'long white beard,' story was nothing but a fabrication, conjured for the benefit of the popular press. It seems rather unlikely that Baird would have exposed important persons to the dangers of moving parts. It's recorded that Baird had suffered, previously, partial disintegration of his 'camera' when spinning components became unglued and rocketed around the lab at devastating high speed. Because of this, during the London, Frith Street demonstration, Baird's entire apparatus was 'covered' by 'screens'. This protection would have been essential to Baird who was fully aware of the competitive 'race' to achieve television and thus would not have exposed his techniques fully to the glare of potential competitors. Also, Baird on this occasion, was using (or so it is alleged) a known image scanning technique called the flying spot. This particular technique is recalled by noted television historian Albert Abramson in his book, 'The History of Television 1888-1941.' Here he mentions Baird's flying spot (or Spotlight) system,

"On January 26th 1926, Baird gave a demonstration of his television apparatus to some 40 members of the Royal Institution at his laboratory in Frith Street, Soho. All of Baird's publicity indicated that Baird had invented a super-sensitive photocell which he kept a secret. No one ever saw his transmitter or his cell. His apparatus was always covered with screens of one sort or another, with the excuse that "extraneous light was not wanted and would interfere with the image." There was even a story that Baird had been experimenting with a cell made of visual purple, which was nonsense. It was also claimed that Baird had invented some "exotic" circuit using a transformer that magically solved his problems. Later it was stated that Baird was very frightened of industrial espionage, but it would be more truthful to indicate that Baird and his financial backers wanted to keep his simple (but most effective) method a secret for as long as possible in order to head off any possible competition. For it was soon realised that the "flying spot system," while patentable, could not be protected.

However, the above extract is somewhat contradicted by R.W.Burns in his book 'British Television-The Formative Years'. The extracts reproduced below clearly don't describe a flying spot system. Burns writes,

"Following the demonstration at Frith Street to members of the Royal Institution, arrangements were made for a private demonstration to be given to a Mr E.G. Stewart. Mr Stewart's very interesting report, written in April 1926, only came to light in 1948. Stewart, a perspicacious engineer, was able to describe and give details of the equipment and impressions which were not mentioned by The Times reporter.

"The subject, which in the demonstration was limited to a size about 10 inch x 8 inch is brightly illuminated, about 500 candle power being used at one foot distance, and placed before an optical device of revolving lenses which continuously explores the whole surface in 32 vertical bands, each ¼ inch width is thus treated as being uniform... at the demonstration the received image was one ninth the area of the subject being 3½ inch x 2½ inch before magnification."

E.G.Stewart went on to describe the quality of reproduction: "I found it possible to distinguish between two human faces I had previously seen in the life whilst opening and closing of the mouth, protrusion of the tongue, orientation of the head and passing of the hand over the face could clearly be followed. At the same time it would be very difficult to recognise an individual previously unknown from the television representation. The inventor agreed however that the image was distorted and attributed it to, (1) inferior optical equipment and (2) to insufficient sub-division of the pictures. He assured me that his lenses now were only lantern condensers and cycle lamp bull's eyes. This would certainly not add clarity to the picture and it would be interesting to see the effect of properly ground and treated lenses."

E.G.Stewart further adds in Burn's book that Baird's equipment was, when giving his early demonstrations 'entirely enclosed except for the input lens'. Stewart also wrote "...he has definitely decided to give a minimum of information upon the details of construction and operation to anyone. In particular the light-sensitive cell which Baird used was a closely guarded secret of the inventor and he told me only sufficient of its construction to demonstrate that it was entirely different from existing cells on the market."

So Baird's apparatus WAS screened although it would appear not to conceal a flying spot mechanism. At least not at the time of the visit of Mr. Stewart. Also, as Mr.Stewart confirms, Baird gave only the bare minimum of technical information. Most revealing, as it does tend to confirm that a secretive Baird wouldn't have relished a bunch of sceptical and hairy scientists to poke around during a live test.

Whom do we believe? Only one historian Albert Abramson has suggested that Baird used a 'secret' flying spot system (now discounted) at the 26th January demonstration. However, it's perhaps significant to recall that Baird, six days before his 26th Jan demo actually applied for a patent involving the flying spot principle. Also, it might be pertinent at this point to remind ourselves that Baird was a bit of an obscurantist and not exactly the fount of all accuracy. In his autobiography 'Sermons, Soap & Television', Baird surprisingly mis-dates his momentous Frith Street Royal Institution demonstration as being on Friday 27th January 1926, when reports state that it was Tues 26th January 1926!

Alfred Dinsdale's contemporaneous book 'Television-Seeing by Wireless' also gives the erroneous Friday 27th date, as does Sydney Moseley's later biography of Baird. Any wonder obfuscation exists? And what of that other old chestnut, that Baird acquired a human eyeball and wired it up in his 'camera' in order to use the substance known as 'visual purple'? Alfred Dinsdale's 1928 book 'Television' attempts to elucidate:

"The early television experimenters endeavoured to construct artificial eyes by substituting selenium for visual purple and building an artificial retina out of a mosaic of selenium cells, each of these cells being connected by wires to a shutter. For every selenium cell used there was a shutter, and each shutter was arranged to open when light fell upon the particular cell connected to it. As each shutter opened it allowed a spot of light to fall upon a screen at the receiving end of the circuit. In this way each selenium cell controlled a spot of light, the image being produced by a mosaic formed of these spots. Apparatus modelled on these lines was actually made by several inventors. Rignoux and Fournier, two French scientists, constructed such a machine in 1906. This apparatus was intended only to demonstrate the principle."

So that explains it. Will we ever know if John Logie Baird became suddenly a televisual Dr Frankenstein and actually wired that eyeball? And finally, did all those years ago, an unfortunate elderly boffin get into the record books as,being the first man to get his whiskers trimmed by the magic of television? One thing is absolutely definite. We know that television was 'invented' on Tuesday 26th January in Frith Street... or was it Friday 27th? Or perhaps BBC Television once broadcast an historical series called 'You Are There'.
If only that was really possible!

Book review by Malcolm Baird

The I.B.C. versus the B.B.C.

And the World Listened... the Biography of Captain Leonard F. Plugge, by Keith Wallis

Kelly Publications, Tiverton, Devon.* £22.50, hard cover, soft cover edition at £12.95

This book is not highly technical but nevertheless it contributes significantly to the history of British radio. Leonard Frank Plugge (1889-1981), known to his friends as Lenny, is mainly remembered as an innovator but his life story bears out Shakespeare's dictum from As You Like It; "one man in his time plays many parts." These included inventor, imposing military figure, ladies' man, sophisticated international traveller, man of the people and social host in the swinging society of London in the 1960s.

Keith Wallis traces these parts through his subject's long life in an excellent, readable biography. The book's pictures convey the flavour of early broadcasting and they can seem slightly absurd to the cynical modern eye. In one picture, Plugge is in a studio at Nuremburg wearing a checked suit of baggy plus fours and he strikes a solemn pose in front of a horn-shaped microphone of antique design; in other pictures a trip across Europe in a radio-equipped car is shown as a high adventure. These were the young and innocent days of radio.

Plugge had an engineering background but it was in civil and not electrical engineering. His first encounter with radio came in 1922 when he was shown a home-made receiver, and it was love at first sight. He saw the potential of the new medium and he was intrigued by the opportunities for British listeners to tune in to "foreign" stations. He also met my father J.L.Baird who was struggling to develop an even newer medium, television. Plugge and Baird were kindred spirits in that they resented the prevalent high-minded official attitude on the control of broadcasting. Established circles were afraid that it might fall into the hands of commercial companies which might lead to "vulgarity". John Reith, the first Director General of the B.B.C., was a staunch opponent of anything which could remotely be considered vulgar. The mind boggles at what Reith might have thought of modern B.B.C. programmes if he had lived today.

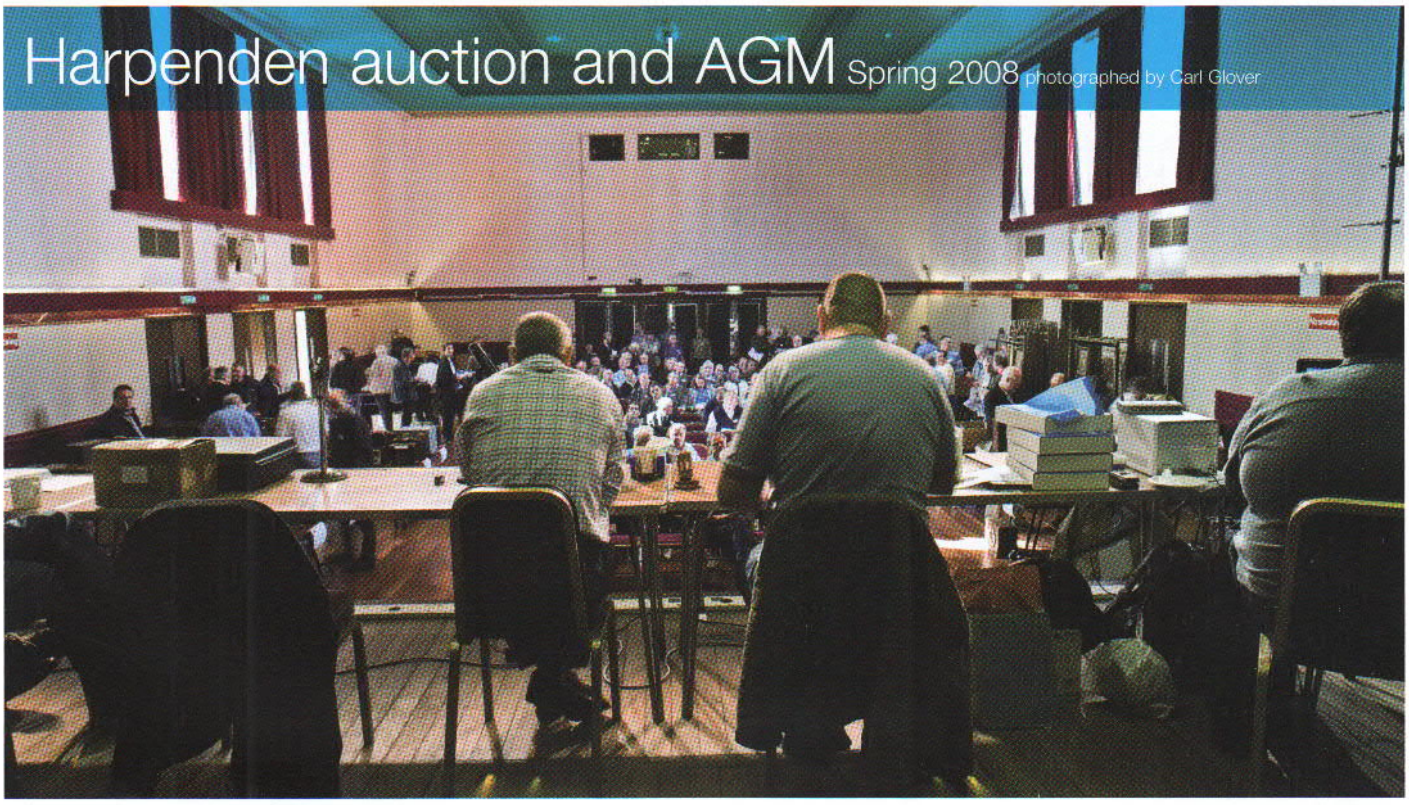
Plugge felt that the B.B.C.monopoly on broadcasting should be broken and he had the drive and the imagination to do something about it. Broadcast radio on medium waves had a range of several hundred miles and by 1931 Plugge had started broadcasting in English from a makeshift transmitter at Fécamp on the northern coast of France, on a power of 500 watts. Within 2 years the power had increased to 20 kilowatts and the station became known as Radio Normandy. An interesting article on its history, by Eric Westman, appeared in the spring 2003 issue of the B.V.W.S.Bulletin. Plugge's controlling company, the International Broadcasting Company (I.B.C.) had its head office in London at Portland Place, just a stone's throw from its rival, the B.B.C.

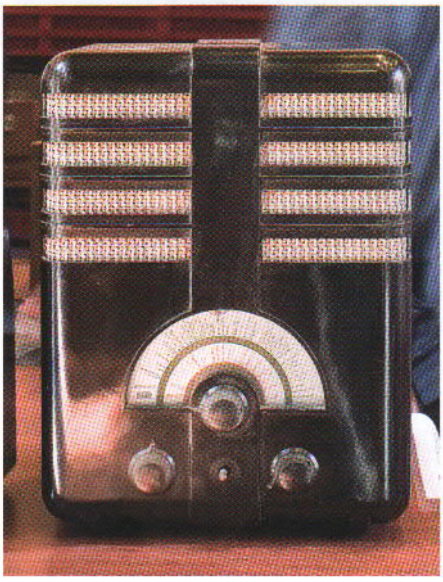
The book follows Plugge's life through its high points in the mid-1930s which saw his marriage to the beautiful Ann Muckleston, his election to Parliament, and the purchase of a luxury motor yacht which was called the LennyAnn. He attended the Coronation of King George VI in "the full dress uniform of an RAF Flight Lieutenant, busby-like headdress and all..." A portrait of him in this splendid attire was hung in the head office of the I.B.C.

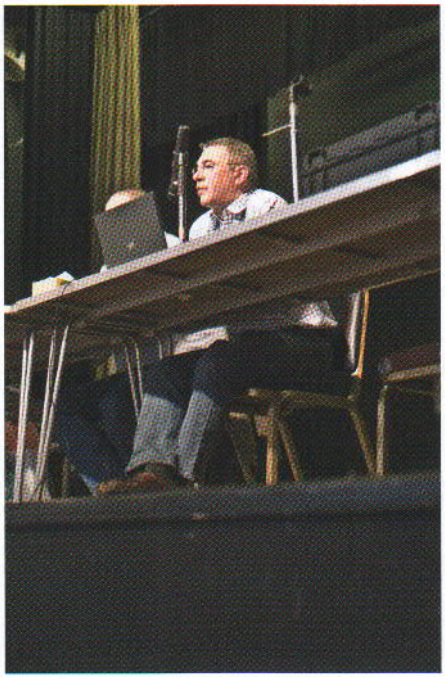
After the outbreak of World War II, things were never quite the same. Radio Normandy stopped broadcasting in September 1939, the Lennyann was sunk off Cannes by the Germans, and Plugge's wife and young son Frank left for the safety of the United States. Plugge had hoped that his expertise in broadcasting could have been of use to the war effort, but this never seems to have happened. According to Keith Wallis the only task that Winston Churchill assigned to Plugge was to deliver a speech of welcome to General de Gaulle, since Plugge was the only M.P. to speak perfect French. Plugge and John Logie Baird renewed their informal contacts in the war years. In 1925-30 Baird had shown that television could be used to detect objects by reflected radio waves (radar) and this may have been discussed between them. Baird also wanted to tell politicians about the success of his independent research on colour and stereoscopic television, while Plugge always liked to be in at the start of something new. Both men looked forward to the eventual removal of the B.B.C.'s monopoly of British broadcasting, but Baird never lived to see it. Plugge lost his parliamentary seat in the Labour landslide of 1945 and the postwar years were not kind to him. He was a charming and generous man who continued to entertain lavishly as late as the swinging sixties. He eventually received war compensation for the destruction of the Lennyann, but his business affairs fell into disorder and he separated from his wife. In the 1970s, his twin children, Gale and Greville, died violently (in one case murder, in the other case a car accident). Plugge died in Los Angeles at the age of 91, leaving about £1100. The Times gave him a respectful obituary and he has been included in the Dictionary of National Biography. This book is the first full biography of Leonard Frank Plugge and it adds colour and fresh insight to the story of Britain's greatest independent broadcasting pioneer.

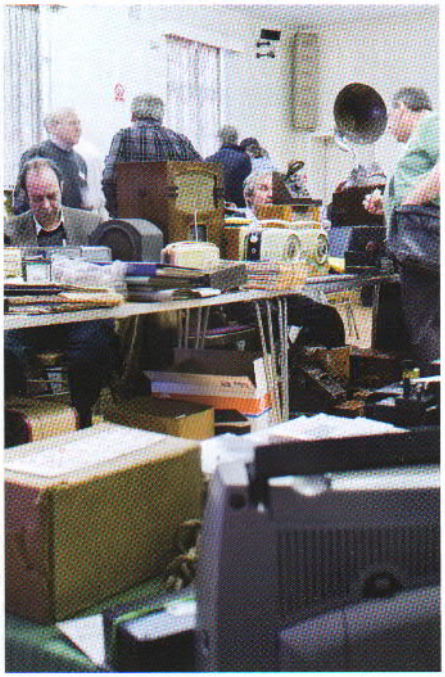
*The book can be ordered direct from the publisher at www.kellybooks.net , post free in the U.K.

Harpenden auction and AGM Spring 2008 photographed by Carl Glover







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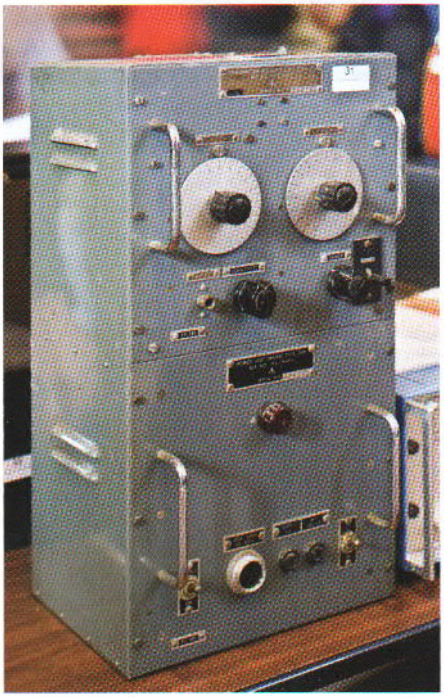


T.M.C. WIRELESS
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THE TELEPHONE MANUFACTURING Co. Ltd.
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GECOPHONE
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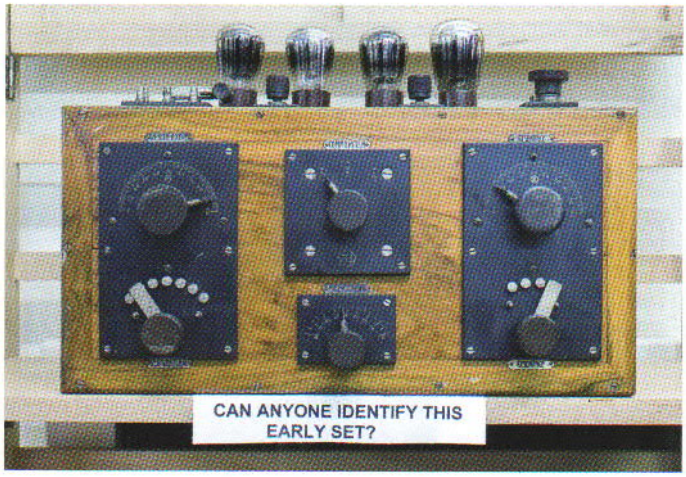
POLAR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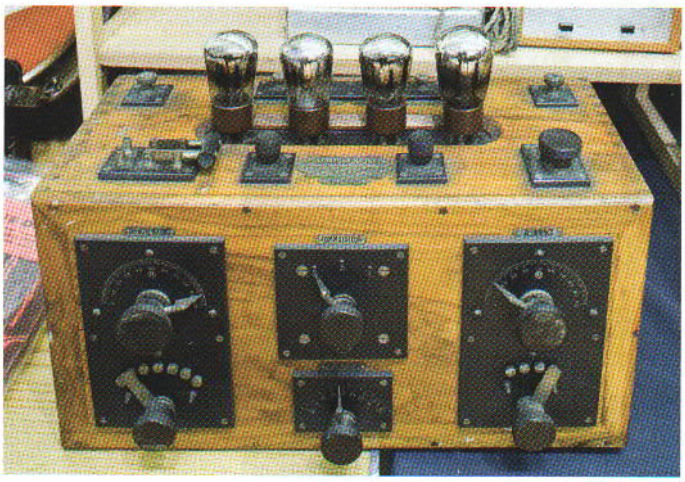

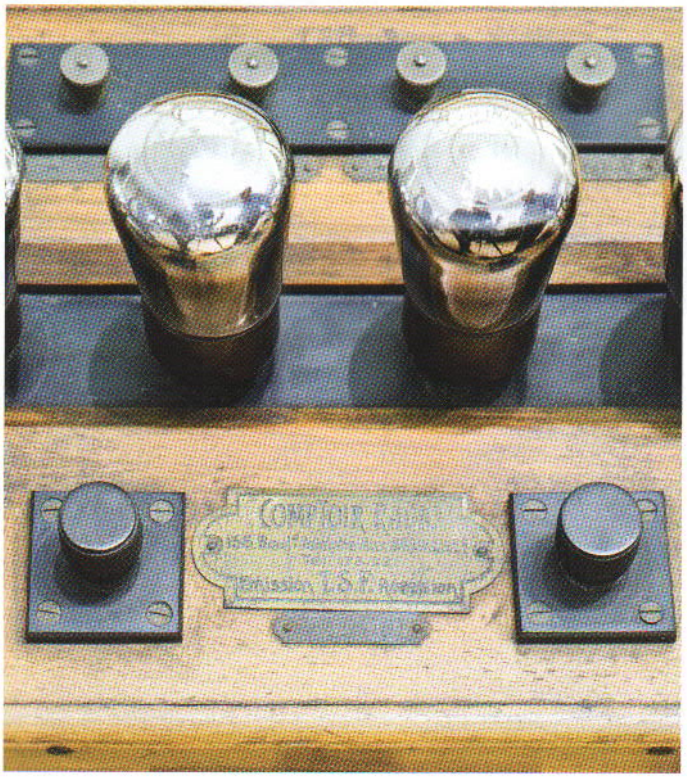
COMPTON


215
MADE BY
REPUTATION RADIO CO.
KIRBY (Wimbledon) LTD.
WIMBLEDON


REVOPHONE


PHONES


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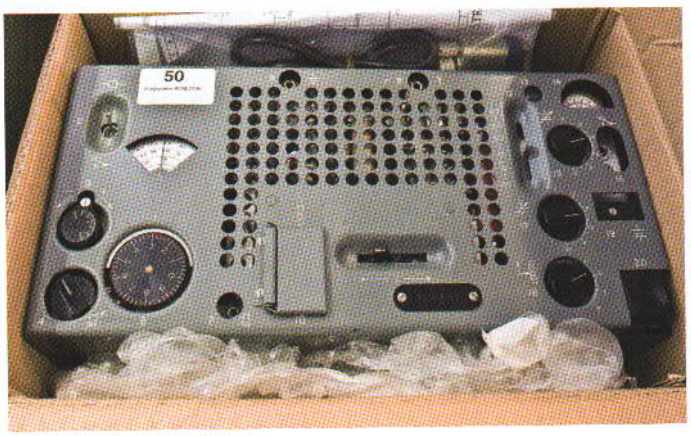
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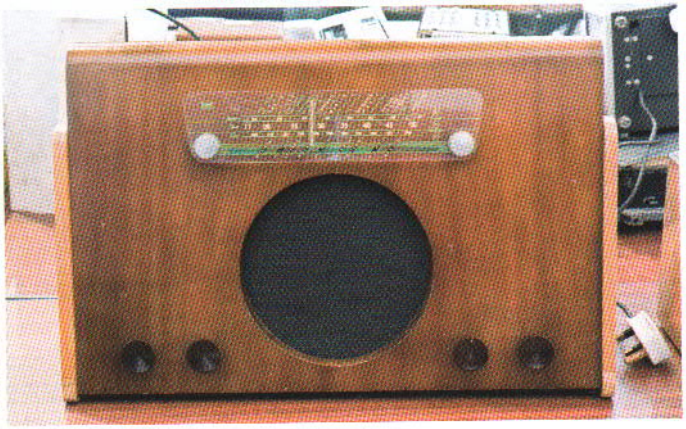


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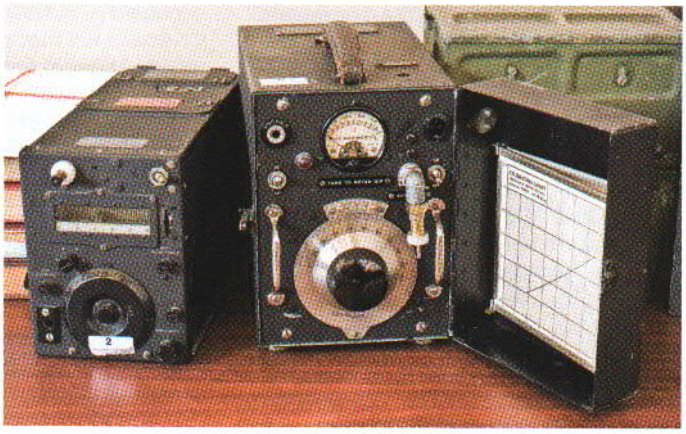

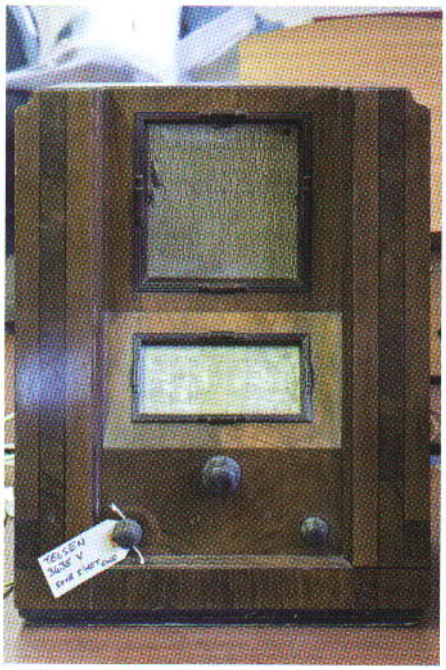
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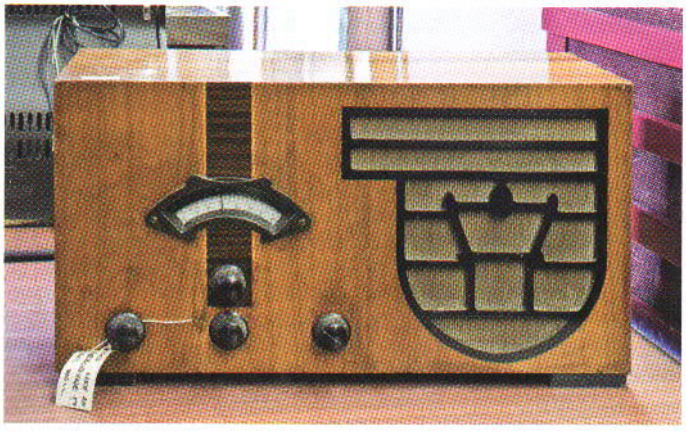


Part N° 334034
6

A brief resumé of British (and several overseas) finished goods & component manufacturers (as at May 2005) part 17 by Dave Hazell

T & P Products, Swan Lane, West Bromwich, Birmingham (in 1958). Maker of clothes drying cabinets.

TAG. Transistor AG, Zurich. Semiconductor manufacturer. Became a Raytheon subsidiary by 1971.

TCC. The Telegraph Condenser Company. Founded in 1906, by Sidney George Brown. In 1911, Vauxhall Street, Kennington Oval, London, SE – "maker of condensers, artificial cable and duplex apparatus, etc.". Since at least 1934, located at Wales Farm Road, North Acton, London, W3 – until well into the 1960's. Other TCC sites were Chessington, Surrey and Whiteside Works, Bathgate, Linlithgow, Scotland. The Bathgate factory opened in 1947, was expanded in 1956 and closed in 1985. They were a major manufacturer of capacitors for industrial and consumer products. Brand names included: Visconol X (dielectric impregnant), Supamold, Duomold, Metamold, Elkomold and Lectropack. They also manufactured printed circuits in the late 1950s for use with (amongst other things) the famous Mullard "5-10" valve amplifier design.

In W. World, Jan 59, p16, it is said that TCC was a member of the BICC group then (and p295 of WW June 1960). TCC was taken over by Plessey, in 1965 (at which time BICC owned around 65% of TCC), for around £3.6 million. Following the takeover, TCC products were branded "Plessey TCC". By the early 1970's, the TCC brand was dropped in favour of "Plessey Capacitors". In 1971, Plessey acquired Arco (of Italy), a capacitor maker. After the TCC takeover, Plessey relocated its own capacitor division at Swindon, to Bathgate. In 1982, Plessey sold its capacitor business to Wedge Holdings (USA), which named it Arcotronics. See Arco.

TOA. Japanese public address equipment manufacturer. In 1967, the UK agent was Audio & Designs (Sales) Ltd, 40 Queen Street, Maidenhead, Berks.

TRW – Thompson Ramo-Wooldridge Corporation. Created in 1958, by the merger of Thompson Products (est. 1901, in Cleveland, Ohio as a maker of fasteners, engine valves and other auto & aircraft products) and the Ramo-Wooldridge Corporation (of Los Angeles) an electronics company. In 1961, Rank Precision Industries marketed (in the UK and some overseas countries) the Dage range of CCTV equipment manufactured by TRW in Michigan City, Indiana.TRW went on to become involved in the US space programme, and made a series of acquisitions, such as United-Carr Fastener, United Transformer Company, Cinch Connectors, etc. In the late 1980's, TRW concentrated on space, auto, defence and IT products. It bought Lucas-Varity in 1999. TRW Semiconductors Inc, Laundale, California (in 1967 & 69).

TT Electronics plc. A UK company that was established in Yorkshire in the 19th century and which used to make hand tools for garden and agricultural use! The Company was incorporated in 1906 as W Tyzack Sons & Turner Limited and changed its name to Tyzack Turner plc in 1985. John Newman and Nicholas Shipp acquired a controlling interest in the company in 1987 and following the sale of the original business in 1988, changed the name to TT Group PLC. Operating as a holding company, TT Group grew with diverse acquisitions. In 1990 TT Group acquired the Crystalate Holdings plc companies. This included Welwyn Components and IRC, a US-based resistor company that was formerly part of TRW. Subsequently, further electronics firms were acquired, including the MMG group in 1993 (which included the Neosid ferrite and magnetic material companies previously owned by Krystinel).

The AB Electronics group was acquired in 1993. In 1997 AEI Cables/W T Henley was purchased from GEC plc. BI Technologies was purchased from Emerson Electric in January of 2000. In March 2001, all non-electronics TT Group companies were spun off to a standalone group. As a result, the company changed its name to TT Electronics plc, with effect from 1st June 2001.

Tandberg (of Norway). In 1960, UK distribution by Elstone Electronics Ltd, Edward Street, Templar Street, , Leeds 2, Yorks. In 1967 & 69, they were at Hereford House, Off Vicar Lane, Leeds 2, Yorks. A C Farnell was a director of Elstone in 1960. In 1969, Elstone changed their name to Farnell-Tandberg Ltd. In 1970, they moved to Farnell House, 81 Kirkstall Road, Leeds. In the 1980's, the firm was simply Tandberg Ltd. The Norwegian firm was established by Mr Vebjorn Tandberg (born 1906), circa 1937. The firm took over Radionette (of Norway), circa 1970 but went into receivership circa 1979. The name survives with several companies (e.g. Tandberg Data, Tandberg Television).

Tannoy – made by Guy R Fountain Ltd., which went into liquidation in 1948. In 1950, the name and assets were acquired by Sound Rentals Ltd, of the same address (Canterbury Grove, West Norwood, London SE27). Up till then SR installed and rented Tannoy equipment. Guy R Fountain, the founder of Tannoy, is the chairman of the new company. In 1954, they are known as Tannoy Products Ltd – same address. In 1957, they also made a pickup cartridge. In 1967, Tannoy Products Ltd, West Norwood, London SE27 and " a member of the Tannoy group of companies". By 1970, Tannoy was on the verge of bankruptcy and was bought by Harman. In 1975, as Tannoy Products Ltd, the factory at the Norwood Road, West Norwood site was closed, leaving a factory in Scotland (Harman) and the HQ at St John's Road, Tylers Green, High Wycombe, plus a small admin and production unit in Canterbury Grove. By Nov 1976, Tannoy sales and head office and R&D had all relocated to St John's Road, Tyler's Green, High Wycombe, Bucks. By 1982, it was Harman UK Ltd. In the Mar 1982 issue of W.World, Tannoy announced they were to buy themselves back from Beatrice Foods Co, of the USA.

Tape Duplicating (The) Co (Great Britain) Ltd, in 1973, a subsidiary of Metrosound.

Tape Recorders (Electronics) Ltd, 3 Fitzroy Street, London, W1 (in 1952) and 784-788 High Road, Tottenham, London, N17 (in 1956 & 1962). Maker of tape recorders. "Sound" brand name has been used. Also "Elizabethan" record players. Acquired by Brayhead in 1964.

Taylor Electrical Instruments Ltd, 419-424 Montrose Avenue, Slough, Bucks (in 1945 & 65). Established in 1938. Maker of test equipment and panel meters (also used the Windsor brand – for export). The company was acquired by Avo Ltd, ca. 1959. By 1962, a member of the Metal Industries Group. By 1971 a Thorn company – they relocated to Dover (Avo HQ) in the same year.

Taylor Tunnicliff. Taylor Tunnicliff & Co Ltd, Eastwood, Hanley, Staffs (in 1950). Factories at Hanley, Stone and Longton, Staffs. Maker of ceramic parts for the radio & TV industry. In 1953 – Taylor Tunnicliffe (Refractories) Ltd, Albion Works, Longton, Stoke-on-Trent, Staffs.

Technical Ceramics Ltd, Cheney Manor, Swindon (in 1968). In 1964 & 67, at New Lane, Havant, Hants. In 1969, at Thornhill, Southampton, Hants. UK distributor for Sansui at one time. UK distributor of Sonotone cartridges in 1964. In 1968, they were the UK agents for Plessey Australia's CT80 broadcast standard audio tape cartridge players. Also see Brush-Clevite and Vernitron.

Tectonic Industrial Printers Ltd, Cirtec Works, Oxford Road, Wokingham, Berks (in 1961 & 68). PCB manufacturer (supplied Dynatron, Decca Marine Radar and Rank Cintel, circa 1961). Changed its name to Tectonic (Electronics) Ltd, in 1968.

Teddington – brand of The British Thermostat Co Ltd, Sunbury-on-Thames, Middx (in 1946). Maker of controls for space heating, etc.

Tee Jay Television Aerials, Boothen Old Road, Stoke-on-Trent, Staffs (HQ and works in 1952). TV aerial maker.

Telcon. The brand for metal alloys, ferromagnetic materials (e.g. mumetal) and coaxial and balanced cables made by the Telegraph Construction and Maintenance Co. Ltd., of Telcon Works, Greenwich, London, SE10 (in 1948). In 1950, the head office was at 22 Old Broad Street, London, EC2. The company's beginnings lay in 1850 when The Gutta Percha Co, which made the first submarine cable between the UK and France, was established. This became The

Telegraph Construction and Maintenance Co. Ltd. in 1864. It became a BICC subsidiary in 1959, together with its 50% shareholding in Submarine Cables Ltd. By 1971, it no longer featured the BICC name in its advertisements (same address in Crawley).

Telcon-Magnetic Cores Ltd, Chapelhall Industrial Estate, Capelhall, Lanarkshire (in 1964).

Telcon Metals Ltd, P O Box 12, Manor Royal, Crawley, Sussex (in 1964 and 1970). Established in 1960, following the takeover of The Telegraph Construction & Maintenance Co by BICC.It had the following subsidiaries: Magnetic & Electrical Alloys Ltd of Burnbank, Hamilton, Lanarks; Telcon Magnetic Cores Ltd of Chapelhall, Lanarks: Temco Ltd (specialist wires) of Lydbrook, Glos and Toolpro Ltd, Ilford, Essex.

Telcon Plastics Ltd, Farnborough Works, Green Street Green, Nr Orpington, Kent (in 1964).

Telcon Telecommunications Ltd. Owned jointly by Mullard and Telegraph Construction & Maintenance.

Telecraft Ltd, Quadrant Road, Thornton Heath, Surrey (in 1950 & 52). A maker of TV aerials. By 1960 (and in 1966), at Quadrant Works, Wortley Road, Croydon, Surrey.

Tektronix UK Ltd, Beaverton House, Station Approach, Harpenden, Herts (in 1963 & 69). The UK company was formed in 1963, to take over the UK agency from Livingston Laboratories Ltd. Maker (in US) of oscilloscopes and other test equipment. In 1961, a manufacturing facility was established in Guernsey, Channel Islands. Acquired Telequipment Ltd, circa 1967.

Tele-Clinic (Sales & Service) Ltd, 36 Brick Street, Warrington (in 1958). Maker of the "Normanda" HiFi speaker system.

Teleconversions Ltd, 48-50 Landseer Road, Holloway, London, N19 (in 1956). Maker of Band 3 converters. In 1957, a transistorised amplifier module for use by Original Equipment Manufacturers (OEMs).

Teledictor Ltd, Birmingham Road, Dudley, Worcs (in 1958). Maker of the "Juno" battery portable radiogram.

Teledyne. A US company. In 1969, it owned the Philbrick-Nexus Research organisation, which had a UK offshoot in Chichester. (Teledyne Philbrick made op-amps). The George A Philbrick Researches originally made analogue computers. In 1973, Teledyne Semiconductor made "Fetrons" – plug in replacements for certain valves (e.g. 12AT7 and 6AK5). Teledyne Philbrick, Allied Drive at Route 128, Dedham, Massachusetts 02026, USA (in 1973) – a maker of op-amps. In 1975, Teledyne Philbrick, Heathrow House, Bath Road, Cranford, Middx. Teledyne Components (formerly Amelco) was combined with Philbrick and then spun off as Telcom. In 2001, Telcom was acquired by Microchip Inc (USA).

Telefield Manufacturing Co Ltd, 120 City Road, Bristol (in 1959). TV aerial manufacturer plus the "Telefield" record player repair stand.

Telefunken
An old established German company, which used to make radio & TV transmitters, electronic components (including valves, CRT's and semiconductors), wireless telegraphy equipment, TV's, radios, tape recorders, etc. It was formed (under a different name) on 27th May 1903, with the amalgamation of several German wireless companies/interests to create Gesellschaft für Drahtlose Tegraphie mbh (Wireless Telegraphy Ltd) – the principal contributing companies were AEG, Braun and Siemens & Halske. The trademark "Telefunken" was registered in the same year. On 17th April 1904, the word Telefunken bacame part of the company's name - Telefunken, Gesellschaft für drahtlose Telegraphie. On 26th July 1932, Telefunkenplatte GmbH was established. On September 24, 1941, AEG took over the 50% of Telefunken shares owned by Siemens & Halske AG. Telefunken thus became a 100% owned subsidiary of AEG. The name of the company was changed to Telefunken GmbH on January 4, 1955. Telefunken GmbH became Telefunken AG on July 5, 1963 – a public company. On 1st January 1967, Telefunken's operations were merged into AEG, to create AEG-Telefunken. The name of the overall company was changed to AEG-Telefunken Aktiengesellschaft on June 21, 1979. After near bankruptcy, AEG was itself taken over by Daimler Benz in 1985. Daimler-Benz, in 1995, dissolved the legal entity AEG-Telefunken and transferred the remaining assets to its wholly owned subsidiary, EHG Electroholding GmbH. Thus, the history of the Telefunken company came to a close, but not that of its brands. EHG Electroholding GmbH still owns the Telefunken name and trade mark, the use of which it licenses to other companies, via its subsidiary Telefunken Licenses GmbH, Frankfurt/ Main, Germany. EHG is the legal successor organisation to AEG Aktiengesellschaft.

In 1957, the semiconductor range was marketed in the UK by Tellux, West Mall Works, 27-29 Rabbit Row, London, W8. In English, AEG stands for General Electric Company. The Telefunken brand name is still used, under various licence agreements.

AEG-Telefunken had co-operated with Decca over the Teldec video disc recording system from the mid-1960's the product was launched in 1970, at the Berlin TV exhibition. They also co-operated with consumer electronics, since Decca made (22" and smaller) "badge engineered" colour TV sets for AEG-Telefunken in the 1970's. Decca also used NSF-Telefunken tuners in their chassis.

Seventy-five percent of the consumer electronics division of Telefunken (Telefunken Fernseh und Rundfunk GmbH, Hanover) was sold to Thomson-Brandt SA of France, on 31st March 1983.

The semiconductors division became part of a Daimler Benz grouping known as Temic, which was then sold to Vishay of the USA (in the 1990's).

Telefunken (-AEG) Ltd, AEG House, Chichester Rents, Chancery Lane, London, WC2 (in 1971). UK sales office for Telefunken consumer electronics.

Telefunken (-AEG), Fachbereich Rohren Vertrieb, 7900 Ulm, Soflinger Strasse 100, W.Germany (in 1970) - valves, tubes and photoelectric devices. Telefunken was founded in 1903 (?).

Telefunken (-AEG), Fachbereich Halbleiter Vertrieb, 7100 Heilbronn, Rosskampfstrasse, Postfach 1042, W.Germany (in 1966 & 70) - semiconductors.

Telefusion Ltd, Telefusion House, Preston New Road, Blackpool, Lancs (in 1965 & 80). In 1965, they were operating TV relay services.

Telefusion Vision Ltd, Cobden Mill, Gower Street, Farnworth, Lancs (in 1973). A new manufacturer of colour TV sets. In WW Sep 74, p330, it states the Telefusion CTV factory is at Kearsley, Lancs. The factory was subsequently taken over by ITT Consumer Products (if my memory is correct) – but it didn't survive for long.

Telemechanics. Telemechanics Ltd, 3, Newman Yard, Newman Street, London,W1. Works at 4, Perry's Place, Oxford Street, London, W1 tel Langham 7965. Registered office 2, Finchley Road, London, NW8. Directors FM Hills and CP Humphris. Manufacturing Electronic Engineers who made Telemax t/v projectors. The company was formed by F M Hills in 1946 and subsequently taken over by the Pena group, which went bust, circa 1958. Mr Hills acquired his former company from the Pena liquidator, in 1959. In 1961, Telemechanics Ltd, Telemax Works, Brokenford Lane, Totton, Hants – maker of "Telemax" heterodyne frequency meters and HV test sets.

TELENG – brand name of Telefusion Engineering Ltd, Teleng Works, Church Works, Harold Wood, Romford, Essex (in 1957 and 1968). The company changed its name to Teleng in 1959. Established in 1955. In 1970, Teleng Ltd, Arisdale Avenue, South Ockenden, Essex. The Television Engineering division of Telefusion Ltd. Makers of field strength meters, aerial distribution systems, etc.

Telephone Cables Ltd, Chequers Lane, Dagenham, Essex (in 1961). Formed in 1961 as a joint venture between AEI and Enfield Cables. Prior to this, the company was known as Southern United Telephone Cables Ltd and controlled by BICC. Later became a GEC, then GPT and finally a Marconi plc subsidiary. Closed down circa 2000.

Telephone Manufacturing Company. Of Hollingsworth Works, Martell Road, West Dulwich, London, SE21 (in 1948 & 50).

Established in 1915. Seems to have become part of AT&E by 1954 and relocated to St Mary Cray, Kent. Amongst wider activities, a maker of mica and paper capacitors and dust cores. Acquired by Pye in 1960 and, in 1970, re-named Pye TMC Ltd. In 1970, they became sole UK agent for Dialight (USA – switches and indicators – already a Philips subsidiary?). They also moved into the old Ekco wartime location in Malmesbury, Wilts. Philips sold off or closed down most of the operations in the 80's.

In 1948, they made "TEMCO" electric clock movements (distributed by TMC-Harwell (Sales) Ltd, 37 Upper Berkeley Street, London, W1 (in 1946 & 64). In 1964, they had locations at: Martell Road, London SE21. Sevenoaks Way, St Mary Cray, Orpington, Kent.

Telequipment Ltd, Beresford Road, London, N8 (in 1952), then 1319a High Road, Whetstone, London, N17 (in 1954). In 1955, they moved to 313 Chase Road, Southgate, London, N14. They were taken over by Tektronix Inc of Beaverton, Oregon, (USA), circa 1967. In 1970, Tektronix UK Ltd and Telequipment Ltd (both UK subsidiaries of Tektronix Inc) were merged to form Tektronix UK Ltd. In 1973, Telequipment division of Tektronix (UK) Ltd, Beaverton House, Harpenden, Herts. Maker of TV test equipment and oscilloscopes. Taken over by Tektronix in the late 1960's. Brand name ceased to be used by Tektronix for low cost scopes, circa 1985.

Telerection Ltd, 12 Suffolk Parade, Cheltenham, Glos (in 1950). In 1954 Antenna Works, St Pauls, Cheltenham. Maker of TV aerials. In 1959, they relocated to Antenna Works, Lynch Lane, Weymouth, Dorset. By 1964, it was Telerection Products, and a member of the Radio Rentals group – also making leg kits for TV's, radiograms, etc. Following their takeover of Radio Rentals, it became part of the Thorn group and provided aerials to be sold under the "Mazda" brand (by 1972).

Teleste Oy, Finland. In 1972, a maker of CATV and professional audio equipment. They bought Labgear in the late 1980's/early 1990's (later, sold back to Labgear's UK management).

Teleton Electro (UK) Ltd, Teleton House, Robjohns Road, Chelmsford, Essex (in 1970). Teleton HiFi products were first imported and distributed in the UK in 1968, by Teleton Elektro (UK) Co Ltd, 66-68 Margaret Street, London, W1. In 1982, at Somerton Works, Princes Avenue, Westcliff-on-Sea, Essex – a former Ekco site. UK office of Teleton, Japan – consumer electronics. (WW June 71, page 277 says that Teleton was the European marketing organisation for Mitsubishi.... or was it simply Mitsubishi Shoji Kaisha of Japan, who were the export distributor for Teleton? Already was, or later became, a part of the General Corp. of Japan.

Television Installation Services (Mansfield) Ltd, Nursery Street, Mansfield, Notts (in 1964 & 82) – also at 20 White Hart Street, Mansfield. CATV/MATV equipment manufacturers. In 1950, at 128 Nottingham Road, Mansfield, Notts and an installer of "Belling-Lee" TV aerials.

Telford Products Ltd, in 1965, at Telford Way, London, W3 and a member of the Davall Product Group. By 1966, also "a member of the Bentima group". In 1970, at 4 Wadsworth Road, Greenford, Middlesex - "The Davall photo-optical company of the Bentima Group". Maker of oscilloscope cameras.

Tellus Super Vacuum Company Ltd, 31 Bower Way, Cippenham, Slough, Bucks (in 1964). In 1964, maker of the "Nilfisk" domestic cleaner.

Tellux Ltd (Radio Division), 146 New Cavendish Street, London, W1 (in 1958). A member of K.G. (Holdings) Ltd. UK distributors of Telefunken radio sets (until 1960). From 1960, to 1964, they distributed Sony products in the UK. Also in 1964, they made Tellux brand radiograms and record players – Avenue Works, Gallows Corner, Colchester Road, Romford, Essex (perhaps the former Regentone factory?).

Telsen. Telsen Electric Co Ltd, Aston, Birmingham. Early British manufacturer of radio components. In 1964, Telsen Electric (1935) Ltd, Fitzgeorge Street, Collyhurst, Manchester 5.

TEMCO – a brand used (in the 1940's at least) by the Telephone Manufacturing Co Ltd.

Tenby – see S O Bowker Ltd.

Tenorel, Lamostraat, 2 Bussum, Holland (in 1975). Dutch maker of cartridges.

Teonex Ltd, 2a Westbourne Grove Mews, London, W11 (in 1965 & 69). Supplier of "Teonex" brand export only valves and semiconductors.

Terry (Herbert, & Sons) Ltd, Millsbro Road, Redditch, Worcs (in 1982). Maker of the fanmouse Terry "Anglepoise" lamps. In 1938, the firm was also in Redditch.

Tetrad. In 1974, a pickup cartridge brand/manufacturer.

Texas. Texas Instruments Ltd, Dallas Road, Bedford (in 1958). UK manufacturing and sales operation of the US semiconductor manufacturer. TI's UK operation was formed in 1956. The basis of this US company was created in 1941, when three employees of Geophysical Service Inc., bought the company from its oil company parent. They were Cecil Howard Green, Henry Peacock, John Erik Jonsson and Eugene McDermott. They diversified into electronic instruments and military equipment. It was renamed General Instruments in 1951 but, due to the already existing General Instrument company, it was quickly changed to Texas Instruments. In the 1950's, TI launched a miniature transistor radio, produced the first prototype integrated circuit and pioneered silicon transistors. Manton Lane, Bedford (in 1964 & 70). USA based semiconductor maker. They also made test and measurement instruments and NiCad batteries and power packs in their earlier years. Thorn used a lot of their semiconductors, from the 2000 dual standard colour TV chassis until the 9000 series. The inventor of the integrated circuit, Jack Kilby, worked for TI from 1958 and on 12th September in the same year, produced simple prototype device. He was born on 8th November 1923 and died on 20th June 2005.

Thames Television Ltd. The ITV (Mon-Fri) programme contractor for the London area, from July 1968 until the end of 1991. Set up by the (ITA encouraged) merger of Rediffusion Television and ABC Television. After Thames lost its ITV franchise, it continued to make programmes as an independent production company and was floated on the stock market as a plc by its then owners BET plc and Thorn EMI plc. It was subsequently taken over by Pearson plc, who later sold it to Freemantle Media group. Its main studio facility was at Teddington Lock, Middlesex (a former Warner Brothers film studio and later, an ABC Television studio). In the 1970s, Thames also built a central London studio on the Euston Road (to replace the former Rediffusion studio facility at Television House, Kingsway). The Teddington studios site was bought by Pinewood Shepperton film studios, circa 2004.

Thandar. A test equipment brand used by Sinclair Electronics Ltd (in WW 1980), London Road, St Ives, Huntingdon, Cambs. In 1981, known as Thandar Electronics Ltd – same address. Later merged with Thurlby Electronics Ltd, to form Thurlby Thandar.

Thermionic Products (Electronics) Ltd, Hythe, Southampton (in 1956 & 66). Maker of HiFi equipment. In 1958, they distributed "Elac" cartridges & stylii in the UK. In 1960, Decca acquired the sole manufacturing rights for their "Microlift" for pickups. In 1960, they ceased the manufacture of domestic tape recorders and dictating machines and concentrated on data logging/voice recording equipment. In 1969, changed their name to Racal-Thermionic Ltd, and later on, Racal Recorders Ltd. Now Thales (2001).

Thermor – brand used by Thermor Electrical Appliances Ltd, Madison House, Molesey Avenue, West Molesey, Surrey (in 1964). Maker of extractor fans.

Thermotank Ltd, 60 Rochester Row, London SW1 (in 1964). Later Hall-Thermotank.

Thomson. Today (2004), this brand is French based but the name comes from the USA. The French connection goes back to the time when the American Thomson Houston company set up a French subsidiary in 1893, in association with agroup of French industrialists – Compagnie Francaise Thomson-Houston (CFTH). In the 1920s,

CFTH set up a joint venture with ITT (USA), to manufacture telephone equipment – Compagnie Des Telephones Thomson Houston. Over the years, the US parent became General Electric USA and the Frecnh subsidiary went on to be a separate entity. In France, over many decades, the company was involved in many and various mergers, asset swaps, nationalisation and privatisation. In 2004, there are two French "Thomson" companies in operation: Thales (who when they were called Thomson-CSF, took over the remains of Racal in the UK) and Thomson (which operates in the consumer electronics and broadcast television fields). Thomson owns, amongst others, the following brands: RCA, Nordmende, Saba, Telefunken, Brandt, Ferguson, Grass Valley and Technicolor).

Thomson-CSF. Created in 1968, by the merger of Thomson-Brandt and Compagnie de Telegraphie Sans Fil (CSF).

Thomson Houston–Hotchkiss Brandt, of France (in 1967). Military, industrial and consumer electronics company. In 1956, Hotchkiss and Brandt merged. Thomson subsequently merged with Hotchkiss Brandt. In 1968, Thomson-Houston Hotchkiss Brandt merged with the French company CSF, to form Thomson-CSF. Later, in 2000, the name changed to Thales.

Thompson, Diamond & Butcher Ltd. In 1950, at 34 Farringdon Road, London, EC1. In 1960, they were wholesalers and marketer of "Top Rank" record players. Acquired by The Rank Organisation in 1958.

Thorens. A Swiss maker of record turntables and arms.

THORN

Thorn Electrical Industries Ltd was founded by (later, Sir) Jules Thorn on 29th March 1928, as The Electric Lamp Service Company Ltd. The name changed on 21st November 1936, when it became a public company - Thorn Electrical Industries Ltd. Thorn celebrated 50 years in 1978 "A world of difference". In the 1950's, Thorn's HQ was at 105-109 Judd Street, London, WC1 (in 1946) In 1958 Thorn HQ relocated to a purpose built 15 storey building – Thorn House, Upper St Martins Lane, London, WC2.

Originally a maker of electric lamps ("Atlas" brand), Thorn took over Ferguson Radio Corporation and many other companies (Avo/Megger/Taylor, Ekco-Ensign Lighting, AEI Lighting, AEI Radio Valves and Tubes, Champion Electric Corporation, Keyswitch and Varley Relays, DER, Radio Rentals, Multibroadcast, Rumbelows, Stanwood Radio, CGS Resistors, Kenwood mixers, Tricity-Bendix appliances, Main gas appliances and Smart & Brown Lighting). When Thorn took over the AEI lighting operations, it was called British Lighting Industries for a time – later Thorn Lighting, based in Leicester (sold to General Electric of the USA in the late 1980's). In 1962, Thorn formed Thorn Electronics Group, for their CCTV, studio and industrial electronics products.

In August 1955 Thorn entered into a joint venture with Sylvania Products Inc., of the USA to manufacture CRTs in the UK, at a factory to be established at Thorn's Enfield site. In 1955, Thorn also established with Sylvania, Sylvania-Thorn Laboratories Ltd, to develop colour TV technology and components. In 1960, they launched a range of germanium power transistors – made in the UK.

In 1957, Thorn & EMI formed British Radio Corporation Ltd, with its HQ office at 21 Cavendish Place, London, W1. BRC was formed to take over the marketing of HMV and Marconiphone TV and radio sets, with the cessation of their manufacture by EMI at Hayes. EMI had a joint share in in BRC. The sets were made by Ferguson.

Also in 1957, Thorn concluded an agreement with Bendix Aviation Corporation of the USA, to manufacture a range of Bendix connectors in the UK.

With the advent of colour TV in 1967, Thorn made Mazda colour tubes at its Brimsdown (former AEI/Ediswan) plant. Thorn inherited a colour TV tube plant at Skelmersdale, Lancashire, when they took over Radio Rentals, circa 1968. It had been set up in conjunction with RCA (holder of the shadowmask CRT patents), in 1966 – RCA Colour Tubes Ltd – two thirds owned by RCA. RCA Colour Tubes started production at Skelmersdale on July 17th 1967. RCA Colour Tubes Ltd, Pinfold Place, Pimbo, Skelmersdale, Lancs (in 1967). The operation was renamed Thorn Colour Tubes Ltd. In 1969, a new factory in Skelmersdale, Lancs, was constructed, to increase output. It was located at Gillibrands Road, Gillibrands Industrial Estate, Skelmersdale, Lancs. However, didn't remain viable for long and was closed circa 1976 with the loss of 1400 jobs in a depressed area.

Thorn Consumer Electronics Ltd, Great Cambridge Road, Enfield, Middx (in 1977). Design and production centre for CTVs. Old Ferguson site. In 1955, Thorn purchased an additional nine acres of land at the corner of Great Cambridge Road/Southbury Road (Enfield), to expand their "Ferguson" and "Atlas" production. The factory was demolished in the 1990's after the site was vacated by Ferguson (by then owned by Thomson of France). TCE changed its name to Thorn EMI Ferguson Ltd, circa 1981, which became Ferguson Ltd on 1/10/87, when it was sold to Thomson GP of France.

Thorn took over the ailing EMI in 1980. In the mid 80s Thorn EMI re-focussed ("business speak" jargon!) its activities and sold off many divisions (including Ferguson to Thomson of France and Thorn Lighting to General Electric USA), leaving just music and TV rental.

Thorn-EMI plc de-merged in 1996. Of the two new companies this produced, Thorn plc (TV rentals) was soon taken over by Nomura (a Japanese investment bank) and was merged with Granada TV Rental to form "Box Clever". EMI, stripped of its Central Research Labs at Hayes (and its electronics businesses) has tried, unsuccessfully, to merge its business with that of AOL-Time Warner and Bertelsmann of Germany. What a sad end to two once great companies!

The electric lamp manufacturing business established by Jules Thorn was originally incorporated in 1928. It became Thorn Electrical Industries Ltd in 1936 and was still engaged in "Atlas" brand light bulb manufacture at a small factory in North London.

Ferguson began making televisions in 1938. As well as a large factory in Enfield, there were others at Hirwaun (S.Wales) – closed in the mid-50's and Cyfartha (near Merthyr Tydfil) – closed circa 1975.

Atlas Lamp Works Ltd. Dormant company by 1952.

Austin Clark (London) Ltd. See also under Champion Electric Corporation.

British Lighting Industries Ltd, created in June 1964, by renaming Atlas Lighting Ltd (a Thorn subsidiary). This followed Thorn's transfer of its lighting businesses into Atlas Lighting Ltd, in April 1964. In December 1964, BLI acquired AEI Lamp & Lighting Co Ltd (an AEI subsidiary until then). At that time, Thorn owned 65% and AEI 35% of BLI. Thorn (which had management control from the outset) bought out AEI's interest in October 1967. In 1968, BLI's main subsidiaries were:

Atlas Lighting Ltd. Sales of Atlas branded products.
AEI Lamp & Lighting Co Ltd. Sales of Mazda branded products.
Ekco Lighting Ltd. Sales of Ekco branded products.
Omega Lampworks Ltd. Sales of Omega and Nura branded products.
Astralec Electrical Industries Ltd. Sales to Woolworths of Vesta branded lamps.
Lamp Presscaps Ltd. Manufacture and sale of bi-pin end caps for fluorescent lamps.
Elgar Research Labs Ltd. Manufacture and sale of fluorescent powders and cathode coatings for fluorescent lamps.
Manifold Machinery Co Ltd. Manufacture of lamp making machinery.
Smart & Brown Lighting Ltd. Manufacturer of lighting equipment and accessories.
Atlas Lighting Overseas Ltd. Holding company for overseas interests.

Electric and Radio Appliances Ltd. Used to supply "Vesta" branded lamps for onward sale by an intermediary company, to Woolworths (between 1952 and 1964).

Lamp Presscaps Ltd. A Thorn subsidiary by the 1970s, which manufactured lamp caps and other metal products.

Manifold Machinery Co Ltd (Thorn acquired full control in 1955). Lamp manufacturing equipment.

Metal Industries Group (by 1968).

Multi-Signals Ltd. A TV relay company in which Thorn acquired a part share in 1959. Became wholly owned in 1964. The company also had a small TV rental operation.

Nash & Thompson Ltd (1960) Newhaven Cabinet Works Ltd, Newhaven, Sussex (in 1960). See under Champion Electric Corporation. In 1968, Thorn also had a cabinet subsidiary company at Rayleigh, Essex.

Smart & Brown (Engineers) Ltd in 1960. By then, a subsidiary of Thorn Electrical Industries Ltd. Manufaturers of auxilliary gear and accessories for use with fluorescent tubes and discharge lamps.

Thorn-AEI Radio Valves & Tubes Ltd, 7 Soho Square, London, W1 (new offices in 1965, still there in 1969). In 1966, Thorn and General Electric (USA) signed an agreement for Thorn-AEI to manufacturer certain GE silicon planar transistors in the UK, to be sold under the Brimar and Mazda brands – made at Brimsdown. Thorn bought out the AEI share in 1969 and the company was renamed Thorn Radio Valves & Tubes Ltd. By 1972, the company was based at Mollison Avenue, Brimsdown, Enfield, Middx. Maker of Mazda and Brimar CRT's and valves. When Thorn withdrew from valve manufacture, circa 1975, it sold the Mazda brand to Z & I Aero Services Ltd (who also used the Zaerix brand).

Thorn Automation Ltd, PO Box 4, Rugeley, Staffs (in 1968 & 69). Electronic control equipment. Formerly, in 1965, Lancashire Dynamo Electronic Products Ltd – a member of the Metal Industries Group.

Thorn Automation of Rugeley and Industrial Division of Thorn Bendix merged in 1972, to form Thorn Automation Ltd. (EMI bought the CATV interests of Thorn Automation Ltd, in 1973.)

Thorn Bendix Ltd, Industrial Electronics Division, Beech Avenue, New Basford, Nottingham (in 1970). Maker of UHF distribution equipment + ...? The wired TV department moved to Great Basford in 1968. Jointly set up in 1967 by Thorn Electrical Industries (UK) and Bendix Corporation (USA), by the merger of Thorn Electronics Ltd, Thorn Special Products Ltd, Thorn Electronics (Laboratories) Ltd, Bendix Electronics Ltd and the M P J Gauge and Tool Company. Electrical connectors, aircraft components, measuring equipment, avionics and defence and industrial electronic equipment. In 1968, the electrial components division was at Great Cambridge Road, Enfield, Middlesex (previously Thorn Special Products Ltd).

Thorn Consumer Electronics Ltd – previously British Radio Corporation Ltd and Ferguson Radio Corporation Ltd.

Thorn Consumer Electronics (Gosport) Ltd, Fareham Road, Gosport, Hants. The former Ultra Radio & Television Ltd, TV plant. In 1965 & 67, still known as Ultra Radio & Television Ltd, Fareham Road, Gosport.

Thorn Domestic Appliances (Electrical) Ltd, New Lane, Havant, Hants (in 1982).

Thorn Electrical Industries Ltd, 105 Judd Street, Euston, London, WC1 (in 1952). In 1954, 233 Shaftesbury Avenue, London, WC2. Later moved to purpose-built Thorn House, Upper Saint Martin's Lane, London.

Thorn Electronics Ltd, Wellington Crescent, New Malden, Surrey (in 1965). TV picture monitors, monitoring TV receivers (no display), etc.

Thorn EMI plc, created in 1980, with the merger of Thorn plc and EMI plc.

Thorn EMI Screen Entertainment. ABC cinemas and Elstree studios operations – formerly Associated British Corporation (ABC). Sold in the 1980s to Cannon (run by Menachem Golan and Yoram Globus).

Thorn Lighting Ltd, Theatre Lighting Division, Angel Road Works, 402 Angel Road, Edmonton, London, N18 3AJ (in 1976). Their "AME" part numbering system meant "Atlas Mazda Ekco".

Thorn-AEI Radio Valves & Tubes Ltd, 7 Soho Square, London, W1 (by 1965). By 1970, the AEI interest had been bought out by Thorn.

Thorn Radio Valves & Tubes Ltd, Mollison Avenue, Brimsdown, Enfield, Middx (in 1971). CRT factory.

Thorn Radio Valves & Tubes Ltd, Rochester Airport, Rochester, Kent (in 1982). The former (STC) Brimar valve factory.

Thorn Special Products Ltd, Great Cambridge Road, Enfield., Middx (in 1965 and 67). Manufacturer of special panel mounting indicators (e.g. numerical, digital and multi-colour), miniature lamps, "Tansitor" tantalum capacitors, etc. By 1968, a subsidiary of Thorn Bendix Ltd.

Tricity Cookers Ltd (in 1960). The Tricity brand is now owned by Electrolux of Sweden, who bought the Tricity & Bendix brands/factories from Thorn EMI.

Tucana Ltd. Formed in 1960/1, to acquire retail shops where the owners were retiring or in financial difficulties. By 1968, Tucana owned 206 retail shops – a third of which traded under the Rumbelows brand. Thorn acquired full control of Tucana in April 1968. Another medium sized TV and radio business acquired by Thorn was Stanwood Radio Ltd.

Thurlby Electronics Ltd, Coach Mews, St Ives, Cambs (in 1979). Maker of bench variable power supplies. Later Thurlby Thandar.

Time Electronics Ltd, 199A High Street, Orpington, Kent (in 1969). In 1974, Botany Ind Est, Tonbridge, Kent. Maker of precision calibration equipment.

Tinsley (H) & Co Ltd, Werndee Hall, South Norwood, London, SE25 (in 1965 & 70). Maker of the (formerly "Cyldon") air spaced variables and trimmer capacitors + - range acquired from Sydney S Bird & Sons Ltd, in 1970.

TMC-Harwell (Sales) Ltd, 37 Upper Berkeley Street, London, W1 (in 1964). Users of the "Temco" brand name.

Toko – Japanese company specialising in IFT's and ceramic filters.

Toshiba – Tokyo Shibaura Electric Co, Japan. Formed in 1939, by the merger of Tokyo Electric Company (Japanese licensee of GE USA) and Shibaura Engineering Works. In 1978, the company name was shortened to just Toshiba. The company grew to become a major international electrical & electronics company. After a short-lived joint TV manufacturing venture with Rank in the late 1970's, Toshiba took over completely the former Bush factory at Ernsettle, Plymouth.

Tower Houseware.s TI Ltd, P O Box 16, Wolverhampton, Staffs (in 1982). Later sold to Polly Peck (with Russell Hobbs – another TI domestic appliances company).

Toyo Musen – Japanese valve manufacturer.

Transipack –see Industrial Instruments Ltd.

Transistor A.G., Zurich, Switzerland. In 1969, a maker of thyristors, triacs, planar p-n-p transistors and rectifiers. Later become Raytheon-TAG.

Transistor Radio Cases Ltd, Chesham Close, Cedar Road, Romford, Essex (in 1964). Associate company: Elmbridge Production Engineers (Wlathamstow) Ltd.

Transitron, Wakefield, MA. A US semiconductor maker – developed the gold bonded diode. Founded in the 1950's. and existed until around 1983. In 1966, their UK office was Transitron Electronics Ltd, Gardner Road, Maidenhead, Berks. By 1967, they were equipping the existing factory at this site, in order to manufacture IC's there.

Transmetrix Electronic Systems Ltd, Hyde Works, Hyde Road, Shanklin, Isle of Wight (in 1966). Manufacturer of an ac millivoltmeter.

Transradio. Transradio Ltd., of 16 The Highway, Beaconsfield, Bucks (in 1947) and 138A Cromwell Road, London, SW7 (in 1948). In 1971, at 183 Park Avenue, London, NW10 – a subsidiary of Felten & Guilleaume Kebelwerke AG, Koln-Mulheim. Manufacturer of coaxial cable and coax connectors. The name lives on today as an RF connector range of products (any connection?).

Trend Electronics Ltd, St John's Works, Tylers Green, Nr High Wycombe, Bucks (in 1967/8). Manufacturer of digital stores and telecoms test equipment.

Triad. Brand name of USA made valves in 1936. UK importer: Amerad (Great Britain) Ltd, Aldwych House, Aldwych, London.

Tricity Cookers Ltd, 109 Kingsway, London, WC2 (in 1948 & 58). Service division (and factory?), in 1958, at 44 Parsonage lane, Enfield, Middlesex. Maker of electric cookers. Acquired by Thorn in 1948, but sold on to Electrolux in the 1980's.

Trio. Trio Corporation, 6-5, 1-chome, Shibuya, Shibuya-ku, Tokyo, Japan (in 1967). Maker of communications receivers and transmitters. In 1967, UK distribution by Winter Trading Co Ltd, then B H Morris & Co (Radio) Ltd, 84-88 Nelson Street, London, E1. Later known as Kenwood.

Tripletone Manufacturing Co Ltd, 147 Merton Road, Wimbledon, London, SW19 (in 1957). In 1959 & 69, at 241a The Broadway, Wimbledon, London, SW19. In 1970, moved to 138 Kingston Road, Wimbledon, London, SW19. Maker of amplifiers with the "middle" tone control – hence the company name - and tuners. Later taken over by K&K Electronics Ltd, 60 St Marks Rise. London, E8 (see my 1970's HiFi mags).

Triplett. In 1938, a brand name for electronic test equipment (USA made). In the UK, the agent was Universal Electrical Instrument Corporation, 7 Chapel Street, London, WC1.

Trix – sound equipment. The Trix Electrical Co. Ltd. 1-5 Maple Place, Tottenham Court Road, London, W1 and 1-5 Maple Place, Tottenham Court Road, London, W1 (in 1958). Established in 1927. In 1955, they also made gramophones. In 1957, the MD was Douglas A Lyons and Trix acquired an additional factory at Wish Road, Eastbourne. In 1959, they also made/marketed the "Trixette" tape recorder. In 1959 & 64, Trix Electronics Ltd, and 1-5 Maple Place, Tottenham Court Road, London, W1. By 1963, acquired by Ultra Electronics Ltd.

Tronix. Brand name of American made valves supplied by Electrical Agencies (London) Ltd, 16 Drayton Park, London, N5 (in 1966). Specialists in obsolete and obsolescent valves.

Truchord Ltd, 82 Great Portland Street, London, W1 (in 1952 & 57). Maker of radiograms, record players and amplifiers.

Truphonic Radio Ltd. Aboyne Road, London, SW17 (in 1938). Radio manufacturer.

Trusound Ltd. Works at Willesden, London, NW2, offices and showrooms at 196 Kingsley Road, Hounslow, Middx (in 1953). Maker of tape recorders. In 1971, Trusound Manufacturing Ltd, Crittall Road, Witham, Essex – maker of PA equipment.

Truvox Engineering Co Ltd, Truvox House, Exhibition Grounds, Wembley, Middx (in 1947 & 50) and in 1955, 15 Lyon Road, Harrow, Middx. Maker of loudspeakers, microphones, PA equipment, tape recorders, gramophone pickups and the "Juno" & "Oco" electric floor polishers. By 1953, Truvox was the wholesale distributor for Rola Celestion speakers. In 1958, they relocated to their newly built factory at Neasden Lane, London NW10. In 1964, Truvox Ltd, Neasden Lane, London NW10 (directors: D D Prenn, O S Prenn & D R S Ezekiel). In 1967, Truvox Ltd, Shore Road, Hythe, Southampton. In 1970, Truvox Ltd was acquired by Racal (via Truvox's parent – Controls & Communications Ltd) and they ceased production of audio products – the Truvox Service Department continued to operate, at Hythe, Southampton.

Truvu. In 1958, the brand name for picture tubes made (rebuilt?) by John Brennan Ltd, Westgate factory, Crail, Fifie. By 1961, it was a brand of Truvu Electronics Ltd, Truvu Works, Strathendry, Leslie, Fife (CRT rebuilders). In 1962, their adverts showed their principal location to be Market Road, Richmond, Surrey (but also with the Fife address shown).

Tube Investments. An engineering group formed in 1919 with the merger of Accles & Pollock, Tubes Ltd and Simplex Electric Co. Simplex later made Creda brand domestic appliances and TI eventually absorbed Russell Hobbs, Jackson, Sunhouse, Radiation (in 1967), Glow Worm Ltd (in 1975), New World and Ascot. TI sold off its domestic appliances/ gas divisions in the mid-1980s.

Tubesure Electronic Ltd, Portland Works, Great Malvern, Worcs (in 1960). CRT rebuilders.

Tucker (Geo) Eyelet Co Ltd, Walsall Road, Birmingham, 22B (in 1939 & 64). Long established manufacturer of metal pressings for use in the radio (and other) industries. Including, solder tags, tags for wiring panels, aluminium cans for miniature electrolytic capacitors, valve caps, etc.

Tudor Accumulator (The) Co Ltd, 50 Grosvenor Gardens, London, SW1 (in 1942 & 46). See also Chloride and EPS.

Tufnol. Tufnol Ltd., based in Perry Barr, Birmingham (in 1946). Tufnol was a subsidiary of George Ellison Ltd, of Birmingham (in 1946). In 1964, Tufnol Ltd, Perry Barr, Birmingham 22B. Famous for their Tufnol (registered trade mark of George Ellison Ltd) shellac impregnated fibre insulation material, which was usually available in sheets.

Tungsram. The British Tungsram Radio Works Ltd (incorporated in 1933), West Road, Tottenham, London, N17 (in 1947) –this UK factory opened in 1934 and was a subsidiary of The United Incandescent Co of Budapest, Hungary. The UK operation assembled imported components and was largely concerned with the supply of the radio maintenance market. With the advent of WW2, the company had to manufacture from scratch in the UK. Tungsram of Hungary was in fact owned by several other companies with valve interests: GE (USA), Philips, etc. In 1944, the Custodian of Enemy Property sequestrated all the shares of British Tungsram. At the end of the war, the International and Electrical Engineering Trust Ltd (which had acquired the various Tungsram companies in Europe) considered their sale. In 1952, Philips UK acquired a controlling interest and management control was passed to Mullard.

British Tungsram valves were distibuted by Siemens Electric Lamp and Supplies Ltd (later known as Siemens Bros. Ltd). In April 1956, it ceased to manufacture its own valves and its factory was closed. Thereafter, Mullard re-branded their own production for sale by Tungsram. In 1957, Siemens Edison Swan Ltd ceased the UK distribution of Tungsram valves . Maker of radio valves (and had no interests outside of valve making). In the 1960's, British Tungsram also marketed semiconductors made by Mullard/Philips (packed in screw topped aluminium tubes – like those used for cigars). Still going in the early 1970's.

Tung-Sol. Brand of Tung-Sol Electric Inc, Newark 4, N J (in 1955). A valve manufacturer. Est 1906 (?) – originally a maker of car headlamp bulbs. Also diversified into semiconductors. In 1961, represented in the UK by Walmore Electronics Ltd.

Tungstone Batteries Ltd, Lathkill Street, Market Harborough, Leicestershire (in 2002). Battery manufacturer (mainly lead-acid). Taken over by Hawker Siddeley, who were in turn taken over by BTR (who later merged with Siebe to form Invensys). Sold by Invensys, with other battery copmanies as Hawker Batteries, to Enersys (USA) circa 2001.

Tygan. Brand name of a type of loudspeaker front covering fabric. In 1964, supplied/made by: Fothergill & Harvey Ltd, Summit, Littleborough, Lancashire.

Letters

Dear Editor
Magnetostriction and 'Talking Trannies'
I am most grateful to you for allowing me a little space so that I may add a bit more info to help unravel the mysteries which appear to surround the phenomenon of audible sound coming from the output transformers of radios.

David Bickerton in Vol. 32 No3 first mentioned the subject and Bill Williams offered an explanation in Vol. 32 No 4, in which he quite correctly states that the two stacks of laminations in the cores of transformers incorporating an air-gap can vibrate relative to each other and cause the sound.

Actually, all transformers are capable of emitting sound, not just air-gapped, single-ended, DC carrying ones. Push-pull ones, fully interleaved ones, C-core and toroidal ones do it as well.

It is caused by Magnetostriction, which the ability of most ferric materials to change their dimensions when subjected to a magnetic field, especially along the axis of the field. If this field is produced by passing an alternating current through a coil or solenoid wound around the specimen this will result in dimensional changes in sympathy with the current.

However, as the dimensional changes are at their maximum when the energising current reaches it peak on both the Positive and Negative half cycles they occur at twice the frequency of the energising current. This is why UK power transformers hum at 100Hz and not 50Hz.

The resulting rhythmical changes in the external dimensions of the core cause oscillatory pressure waves to be set up in the surrounding air, making the sound.

Magnetostriction has been utilised for well over eighty years in the production of transducers for use in marine depth sounders and fish-finders. These generally consist of a large number of nickel laminations clamped together, side by side, forming a pack.

Instead of having only one central limb, like most transformers, the laminations are stamped in the form of a ladder and around each one of the 'rungs' the energising coils are wound, forming a flat-plate radiator. This 'Pack' is then recessed into the underside of the vessel with one of the two broad faces pointing downward, or mounted in a streamlined housing to minimise aeration when the vessel is under way, as the bubbles would prevent the ultrasonic energy from reaching the water below.

Repetitive bursts of ultrasonic AC are then applied to the energising windings and the resulting bursts of ultrasound travel downwards, until they strike the seabed and are reflected back upwards until they impinge upon the face of the transducer, generating a small signal.

This signal is then amplified and the time (in milliseconds, or seconds) between the transmit pulses and the arrival of the seabed echoes is converted into feet, fathoms or metres and displayed on analogue or digital meters, chart recorders or CRT A-Scope indicators.

I do apologise for straying off the main theme of what our Society is about, -mainly the rescuing and preservation of precious vintage technology, but I did want to donate some more information on the subject.

Now, a word of caution, should any members be tempted to disconnect their loudspeakers and listen to the OPT, then please make certain that the volume-control is at minimum before doing so. Do not then, advance it too far as the enormous peak voltages induced in the unloaded primary are likely to cause insulation breakdown or a firework display in the output valve. (The old '-L dI/dT' thingy) EITHER of these happenings will cause you to mutter 'Wish I hadn't done that'. Happy Listening!

Mike Rodgers.
HL2MIKE@HOTMAIL.COM

Dear Editor
May I suggest an alternative way of presenting the cumalative index in the BVWS handbook. It would often be helpful when researching something if all articles citing a particular set, component or technique were referenced to that article. Often, the title gives no clue to specific items of information contained within.

When I was a project engineer long ago I gave bright young engineers who made helpful suggestions the task of implementing them. I regret that I must decline any such invitation.

LL (Bill) Williams

Dear Editor
I spotted this in 'Punch' magazine 5/2/1947 and thought it might be of interest to the readers:

To a Lady at Alexandra Palace

Close on half–past eight at night,
Standing in a pool of light
Looking cool but feeling hot
From the focussed kilowatt;
Patiently you wait your cue,
Patiently I wait for you.

Through a lens your image flies,
Mouth and nose and ears and eyes
Into little pieces break
On a sensitive mosaic;
Finer than the finest sand
Electronically scanned.

Lady, do you realize
Now you have no ears or eyes
And in separate little bits
Now your pulsing signal flits
Lightly as a fairy fable
Down a multi–channel cable?

In this novel guise you race
To Control Room–here your face
Blokes sympathetically mend
For the demon tilt and bend;
Seizing opportunity,
Places light where shade should be.

Gaining power on you go
Soon becoming radio,
Jolly little ultra–short
Waves of you surge and cavort,
Travelling with the speed of light
Over roof–tops through the night.

Conjured out of space at last
By the di–pole on my mast;
Down concentric feed–in wire
To a corner by my fire,
Through the vision superhet
Of my television set.

Now each movement clearly seen
On the surface of the screen;
Nimble gestures busk and play
With the fleeing cathode ray;
Smiling at your eager host...
Aetheric and graceful ghost.

Sincerly,
Ralph Barrett

BVWS Books

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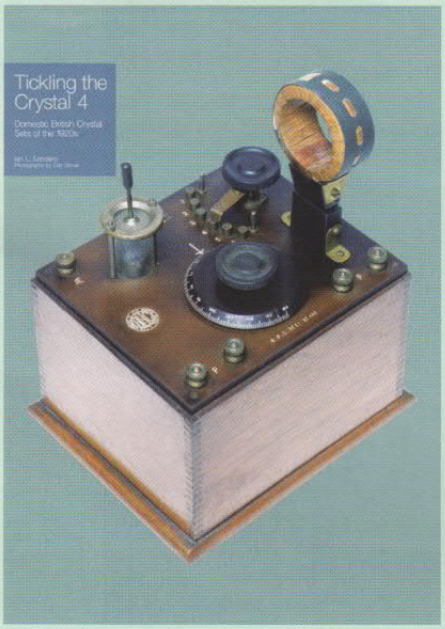

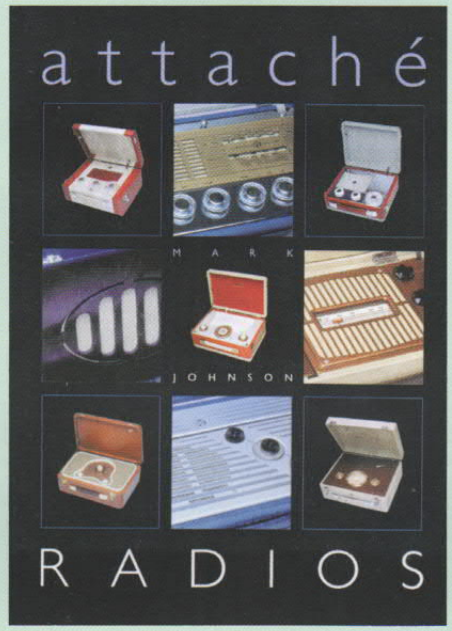

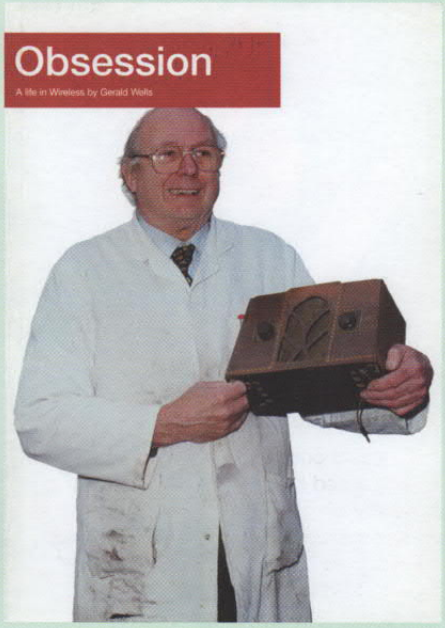

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by Gerald Wells

Gerry Wells had led an extraordinary life. Growing up in the London suburb of Dulwich in the inter–war years, he shunned a conventional 1930's childhood, preferring wireless and other household items. After the war he managed a career as a radio and TV service engineer and even designed and managed amplifiers, PA equipment and TVs. Today he runs the Vintage Wireless and Television Museum from the same family home from where he was born in 1929.

In this book Gerry brings to life his colourful past. This is the story of one man's dedication to wireless

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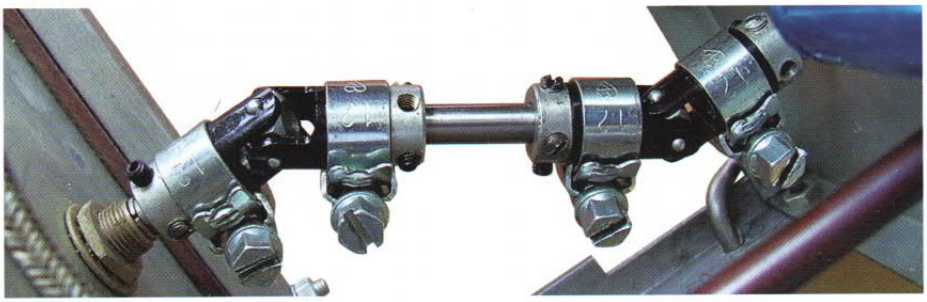
BVWS Books

Repair of an Advance Signal Generator SG62B continued from page 23

Above: Cutter used for the dial cover



Above: Waveband switch offset coupling

cutter obtainable from Screwfix Direct UK.com. It has a very sharp interchangeable blade and "cuts holes from 40 to 210mm diameter in plywood, rubber, plastic, cardboard and other soft materials". It works well but I'm not sure I would want to try cutting a hole for a speaker baffle board with it!

The disc had a line scribed across it, that was filled with a black marker pen, for the dial graticule. It was then mounted on spacers, above the dial, as can be seen in picture 1.

The offset drive, to the waveband switch, is achieved using a pair of plastic knuckle joints. These are splined onto metal collars having grub screws to secure to the shafts. The plastic no longer gripped due to wear and minute longitudinal cracks in the plastic. A perfect cure was to tighten small Jubilee clips around them.

I cleaned up all the covers and re-sprayed them with a closely matching paint.

The electronics

There wasn't much to do here apart from fit a new mains lead and new electrolytics for the power supply. The valve tested good.

The coarse attenuator is nicely constructed in a die cast metal housing, an area where home made signal generators fall down. It does ensure accurate attenuation at high frequencies. However, I did test it using DC from a bench supply and a digital voltmeter.

The dial frequency calibration, against a digital counter, came out mainly within the 1% specified and better than 2% elsewhere. There is a re-calibration procedure given but for me this was close enough as I always use the counter on a 'T' with the output.

The output was level with frequency within the +/- 3% specified.

Conclusion

Once again, it is an excellent signal generator.

Below: previously unseen photograph of shop display in 'Schoolbreds' Tottenham Court Road, London. Notice to right of gnome says 'The outstanding feature of Olympia Exhibition'. Photographs kindly loaned by Tony Bottrill.

'Cathode Ray Tubes and Thermionic Valves: Some key years' continued from page 17

types of valves developed for radar systems working at ever shorter wavelengths.

1943 Development of 7 pin miniature 6.3v indirectly heated valves in the USA. First manufacture of a 7 pin miniature valve in the UK by Ediswan, using a production line brought over from the USA.

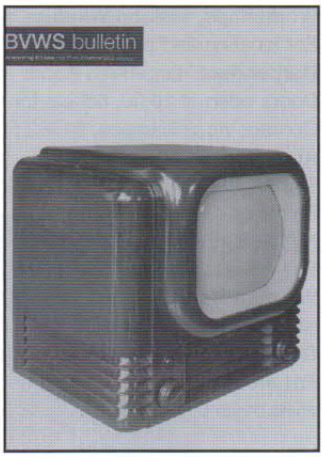
1946 Development of the 9 pin miniature valves, the first type being the 12AU7 double triode. Made in the UK and Europe subsequently as the ECC82.

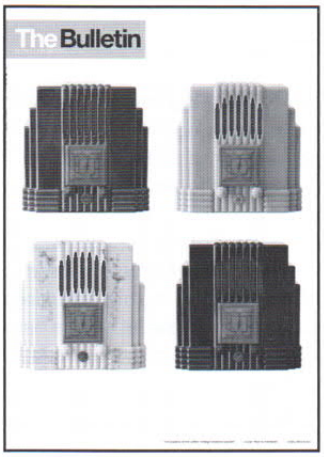
1988 Closure of the MOV factory at Hammersmith, West London. Companies such as Mullard, Ediswan–Mazda and Cossor–ETL closed their factories in the 1970s. Industrial types made by STC lasted a little longer. The last mass–produced consumer valve factory in the USA, GE–MPD was closed in the early 1990s. Valves continued to be made in China, Russia, the Czech Republic and former Yugoslavia. Limited production by a re–established Westrex Corporation of audio valves in the USA. The break up of large companies such as RCA resulted in the formation of small specialised valve manufacturers to make limited ranges of those industrial types still in demand, such as high power klystrons for television transmitters and other high power valves such as ignitrons, thyratrons and rectifiers. The main bulk of low power consumer valve manufacture is driven by the musical trade, with many brands of guitar amplifiers using well known audio types such as the EL34 and 6L6GC. New manufacture of high fidelity equipment consumes a small quantity of the same and similar types.

References:

'70 Years of the Radio Tube and Valves' - John Stokes, 1982.
'Saga of the Vacuum Tube' Gerald Tyne 1977.
'History of the British Radio Valve to 1940' Keith Thrower, 1992.
Various valve data books and manuals from 1924 to the 1950s.

Eighth page advertisements cost £22.50, quarter page advertisements cost £45, half page: £90 and full page: £180. Cheques made payable to 'BVWS' please





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 phoney 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 & 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.

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News and Meetings

GPO registration Numbers

Martyn Bennett is the custodian of the BVWS GPO Registration Numbers list. As many members know, the project of assembling this list was started in the early days of the BVWS and was carried on by the late 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.

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

2008 meetings
6th July Wootton Bassett
20th July Workshop at Vintage Wireless and Television Museum
15th August Friday Night is Music Night at Vintage Wireless and Television Museum
14th September Table top sale at Vintage Wireless and Television Museum
12th October Audiojumble, Tonbridge
19th October Harpenden swapmeet
2nd November Workshop at Vintage Wireless and Television Museum
7th December Wootton Bassett

2009 meetings
5th July Wootton Bassett
6th December Wootton Bassett

Workshops, Vintage Wireless and Television Museum:
For location and phone see advert in Bulletin. 11:00 start.
Harpenden: Harpenden Public Halls, Southdown Rd. Harpenden. Doors open at 10:00, tickets for sale from 09:30, Auction at 13:30. Contact Vic Williamson, 01582 593102
Audiojumble:
The Angel Leisure Centre, Tonbridge, Kent.
Enquiries, 01892 540022
NVCF: National Vintage Communications Fair
See advert in Bulletin. www.nvcf.co.uk
Wootton Bassett: The Memorial Hall, Station Rd. Wootton Bassett. Nr. Swindon (J16/M4). Doors open 10:30.
Contact Mike Barker, 01793 536040
For more details with maps to locations see the BVWS Website:
www.bvws.org.uk/events/locations.htm

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