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From the chair

Bulletin of the British Vintage Wireless Society
Volume 24 No.4 Winter 1999

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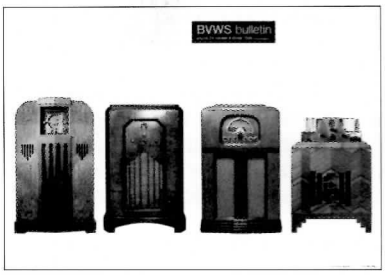
Separations by Cutting Edge
Printed by Apollo



Front and rear cover: various Scott and McMurdo Silver wirelesses plus a Midwest.

Front and rear cover photography by Carl Glover
Graphic Design by Carl Glover

Assistance by Rob Chesters
Proofreading by Mike Barker, Ian Higginbottom and David Read

I just cannot believe how this year has flown by. It only seems like yesterday that I was in the midst of piles of renewal forms, and here we are again, December, and I am sending them out to you once more.This year you will notice a change in the renewal forms. I have designed them so that they show the information we hold on Computer about you. Instead of the usual filling in of the form, all you need do is to check the details and make any amendments. Notice, the form now tells you clearly if your subscription is due, or if you are paid up for the year 2000. When checking the form, please tell us which Bulletin article (including this Bulletin) that you have enjoyed the most in 1999 and fill in the question on the form. We will then use this to present the "Pat Leggatt Award" to the Author of the most nominated. Please! Please! Please! Get the form sent back to me as soon as possible, it makes life very difficult when they are returned after the end of January.It is neither right nor fair for me or any new Membership Secretary to have to handle renewals after 31st Jan 2000 as you have almost 2 months to return them.

I am very pleased to announce that Terry Martini, of whom many will know, has volunteered to become the official Harpenden Organiser. Terry will take over from January 2000. Steve Sidaway will remain as Events Co-ordinator.

For those of you who did not make it to the Duncan Neale Auction, let me tell you, you missed a rare treat to be surrounded by such marvellous items. The quality was breath taking, the Auction was conducted with fine professionalism and it was clear that special attention to detail had been taken on the part of Dreweatt Neate. The catalogue alone was a work of art and reference. The whole event being set in a relaxing setting.

Now for an apology. I regret to say that with the huge amount of work that I have taken on this year, it has not been possible to complete the Members Handbook in time to be posted this year. However, be sure that I am committed to getting it finished and sent out with the first posting of 2000 so look out for it then.

You will, by now, have spotted the CD-ROM that has fallen out of your Bulletin. Well, the survey that we sent out last year showed that the majority of the membership was interested in Restoration and Repair. So to help with this and to fulfil the largest number of requests we get, we have worked with the ERT Magazine, and gained their permission to use the original TRADER service sheets to create this CD-ROM which contains the first 800. The sheets are put together in a printable format so you can use the sheets on the bench. If you do not have a computer I hope that you can find a friend or fellow member who can help. A massive Thank you goes to Peter Foden and Paul Stenning for the many hours of work spent scanning the sheets and cleaning up the appearance of the originals. My thanks also go to Ron Deeprose for finding and supplying those sheets that were missing from my sets of Traders so that we could deliver a complete run. Next year we intend to continue the run from sheet 801 onwards.

As if that was not enough, I would like to thank Gordon Bussey for supplying the enclosed GEC Marconi Centenaries 1999 booklet, that details many interesting facts and pictures of early Wireless achievements.

It just remains for me to wish you a Merry Christmas, and a fantastic New year celebration.

Mike and Jeff Borinsky manning the BVWS stall at the NVCF in Birmingham. Photo: Jonathan Hill.

Contents

Editor Speaks!

This issue of the BVWS Bulletin celebrates my fifth year as editor and eventually has finally realised an ambition I have had since first becoming editor all those years ago (I assure you that it seems a very long time ago indeed), and that is an article on those impressive multi-valved Scotts and McMurdo Silvers. it has always been a bit of a mystery why these sets seem to rarely appear in the (worldwide) wireless press. I wouldn't necessarily wish to own one (due to cramped space) but I'm glad they exist.

Visitors to the Autumn Harpenden may have noted my absence from the swapmeet, this wasn't due to being 'Stateside' (the usual excuse), but the fact that my partner Christine was in labour. The next day she gave birth to a baby girl, who has consequently been named 'Kitty' and takes up a lot of our time. For a few weeks the Bulletin has taken a back seat, but not enough for this issue to be adversly affected. This issue is one of those occasional 48 pagers, due to the larger-than-usual articles between these pages. I hope you enjoy it.

On Sunday 7th of June 1981 the chalkpits musuem at Amberley in West Sussex held its second Wireless Communications Day. Ian Higginbottom and I represented the BVWS and manned two tables of vintage wireless from our own collections to stimulate interest. Those of you who have Jonathan Hill's History of the British Vintage Wireless Society might like to look at page 40 where there is a photograph taken by Mike Smallbone and a brief account of the event. Also present were many members of the Radio Society of Great Britain (RSGB) who held an open day at the same time. I had a special reason for wanting to make contact with some RSGB members in order to do some detective work, but before going into the reasons why, a word or two about radio amateurs would be in place because I do not think that their unique contribution to the development of radio has been covered in the BVWS Bulletin.

A Radio Amateur and a Handful of Wichety Grubs

Including a brief account of the contribution by radio amateurs to the development of radio from the London Wireless Club to the formation of the B.B.C.

By David Read

'In fact we may say that wireless telegraphy itself in its inception was an amateur product. Numerous important inventions such as the crystal detector, the oscillation valve the three-electrode valve - have been due to private or amateur work.'

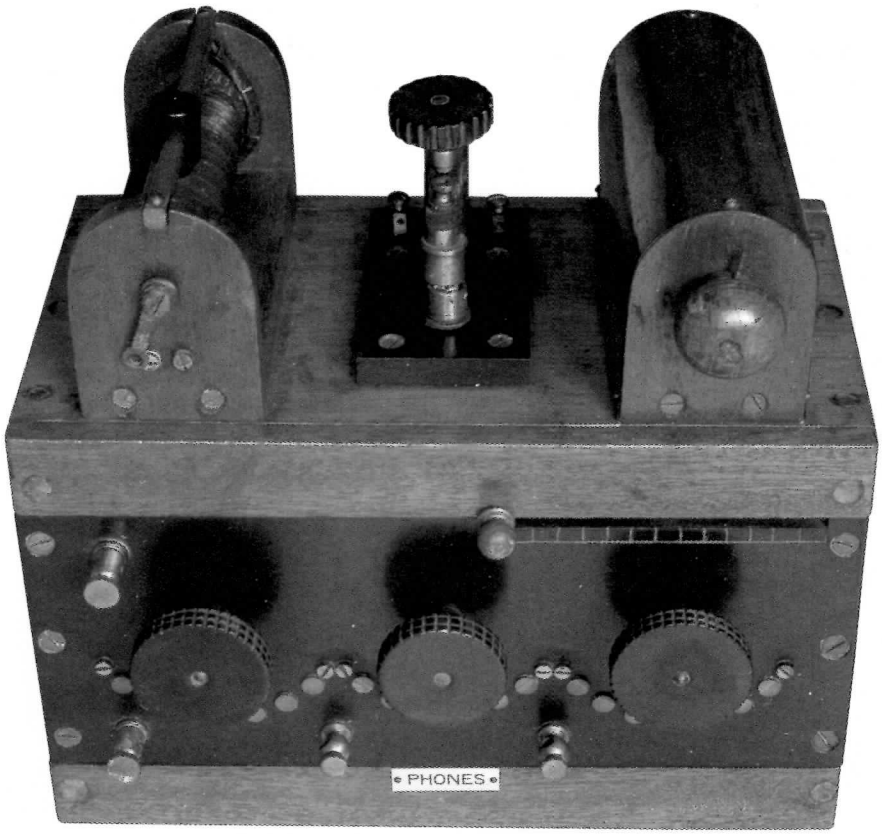
The Radio Society of Great Britain has a distinguished place in the history of radio communications and under its earlier name - The Wireless Society of London - it played a vital part in the events that led to the start of experimental broadcasts and eventually the formation of the BBC. Starting out in July 1913 as the London Wireless Club it was to be renamed in September of the same year as The Wireless Society of London and attracted some of the most eminent men of science at the time. Its origin was due at least in part to the need for an organisation that would be able to negotiate with the Post Office on the subject of licences for experimental broadcasts and the quite remarkable list of members suggests that pressure on the authorities must have been considerable.

The first President of the 'Society' was A. A. Campbell Swinton and its Chairman was Frank Hope-Jones, Chairman of the Synchronome Company which manufactured electric master clocks and the Horophone for listening to time signals from the Eiffel Tower. Leslie McMichael was a committee member. Sir William Crookes President of the Royal Society and Sir Oliver Lodge, F.R.S. were honorary members whilst amongst the panoply of Vice Presidents could be found Le Commandant Ferrié (responsible in France for the development of the 'French' or 'R' valve for the coming war in Europe), Dr. John Ambrose Fleming F.R.S., William Duddell F.R.S. and S. G. Brown. Rooms for the Society were rented at Gamages in Holborn but activities were suspended because of the war and all wireless apparatus not required for public purposes was taken into Post Office custody. Post war the Society was crucial in breaking down the bureaucracy of the government and in particular the Post Office so that the activities of radio amateurs should not be unreasonably curtailed. Reading the Wireless World during the immediate post war period reveals an almost paranoid attitude in government circles. An Inter-Departmental report stated that "the number of stations (amateur transmitters) existing in July 1914 was excessive from the point of view of Government control" and later "there was no justification for it from the point of view of the encouragement of research or the development of industry." The committee went on to recommend that every applicant for a transmitting licence should be of British Nationality, and an efficient operator. When faced with the fact that many radio amateurs were distinguished scientists (as distinct from Morse operators) the Committee recommended that "to meet the case of a person of recognised scientific attainments but small operating ability a licensee should be given the alternative of employing a qualified operator to work the apparatus."

Meanwhile some of the greatest names in science and the development of wireless wrote to the Wireless World with the opposite view. Between January and December of 1919, Marconi, Dr. Ambrose Fleming and Professor W.H. Eccles all made their positions clear to the editor. In one of Marconi's letters he wrote: "In my opinion it would be a mistaken policy to introduce legislation to prevent amateurs experimenting with wireless telegraphy. Had it not been for amateurs, wireless telegraphy as a great world-fact might not have existed at all. A great deal of the development and progress of wireless telegraphy is due to the efforts of amateurs."

Dr. J. Ambrose Fleming M.A., F.R.S. inventor of the thermionic valve and Professor of Electical Engineering at London University wrote with crushing power: "It is a matter of common knowledge that a large part of the important invention in connection with wireless telegraphy has been the work of amateurs and private research and not the out-come of official brains or the handiwork of military or naval men. In fact we may say that wireless telegraphy itself in its inception was an amateur product. Numerous important inventions such as the crystal detector, the oscillation valve, the three-electrode valve - have been due to private or amateur work. If full opportunities for such non-official and research work are not soon restored the progress of the art of radio telegraphy and radio telephony will be greatly hindered."

Encouraged by letters like these the pages of Wireless World became inundated with criticism of the Government for its head-in-the sand attitude and reluctance to ease the paranoid restrictions on amateur transmissions. The first signs of relaxation of the Defence of the Realm Act came in April 1919 when the Post Office announced that the restriction on the sale of buzzers had been removed. Spark coils and headphones could also be purchased on the condition



Above: Picture of an amateur made pre-broadcast crystal set based on the Marconi multiple tuner.

'It should be remembered that wireless telegraphy was, in first instance, originated and has since been largely developed, by men who at any rate to begin with, were not even electrical engineers or electricians, and still less qualified telegraphists...'

that the buyer gave a written guarantee that they would not be used for wireless purposes without the written permission of the Postmaster General. Restrictions on valves remained. Then in May of the same year licences were issued for the reception of Time Signals by clockmakers in connection with their business. (See my article on the Horophone and the Tempus crystal sets in "The Transmission of Time Signals by Wireless" Bulletin volume 21/2 page 13.) At last things were beginning to move and in October the Post Office announced that informal authority could now be granted for the use of receiving apparatus. At the same time the use of valves became legally possible with the prior authority of the Postmaster General and the payment of a licence fee of ten shillings. With a degree of amateur activity once again possible, the first post war meeting of the Wireless Society of London was held on the 28th of October with Campbell Swinton presiding and fully reported in the Wireless World. Hope-Jones was in the Chair and presumably pleased that listening to time signals and other broadcasts from the Eiffel Tower was now legal (with a licence) since it should encourage the sales of his Horophone and Master Clocks. Under his stimulation the idea took root that affiliation of other local societies to the Wireless Society of London would enable the Society to represent the large body of amateurs in the matter of Licences and on a national scale. At this historic meeting, therefore, the first glimmerings of the RSGB could be seen. It was also historic in that examples of wireless equipment from military surplus as well as commercial was shown by members and Company members such as John Scott-Taggart, Marconi, and B.T.H. Although not open to the general public this was the first ever wireless exhibition shown in London.

By November it was clear that experimental transmitting licences would be re-issued but first a new Wireless Telegraphy Bill had to pass through Parliament. In January 1920 Frank Hope-Jones reported to members of the London Society that all known wireless societies and clubs had been invited to affiliate, and that members of all those clubs which accepted affiliation would be able to attend an annual conference. The first of these took place on February 27th and amongst those attending were Basil Binyon (see my article on "POLAR" and the Radio Communication Co. in Bulletin Vol.23/3 Autumn 1998) and Admiral Sir Henry Jackson. The weight of pressure on the Government to get on with the reissuing of transmitting licences by distinguished people from every corner of the academic, military and commercial world was becoming overwhelming. However, it took nine months of lobbying behind the scenes by the London Society to make what seemed to the affiliated societies very little progress in securing agreement on the matter of regular broadcasts of the type carried out on the Continent and in the U.S.A. Even Marconi's Chelmsford station was not allowed, even once a week, to transmit a short concert or news bulletin by telephony. The situation came to a head at the AGM of the Society in December 1921 at which a Petition about to be presented to the Postmaster General and signed by the officers of the London and all Affiliated Societies was revealed. Its main theme was the exclusion of telephony from such experimental transmissions by Companies and Amateurs as the Post Office allowed. The Petition brought about a quick result and some of the salient points in it make gripping reading which is at the very root of broadcasting history. Having laid out the diplomatic preliminaries, the Petition goes on to say: "We desire to express our regret that wireless telephony has not been included in this arrangement and to say that we hope that this restriction may be reconsidered... we would point out that it is telephony in which the majority of our members are chiefly interested at the present time, this being the most recent achievement in wireless and that in which, for moderate distances at all events, improvements such as of avoidance of distortion and the production of really articulate loud speakers and such like, are most required". And later: "It should be remembered that wireless telegraphy was, in first instance, originated and has since been largely developed, by men who at any rate to begin with, were not even electrical engineers or electricians, and still less qualified telegraphists... New inventions and important improvements are still being made by this class of person and the more numerous they are the more chance there is for good and useful work to be done. In this connection it is noteworthy that it is entirely due to amateurs that all records have quite recently been broken by the successful transmission and reception of signals across the Atlantic on 200 metre waves. And later still: "Furthermore the requirements of the large number of such amateur users have led to the establishment of numerous factories for the manufacture of wireless instruments and apparatus, where skilled designers and workmen are employed and many experiments are carried out and where quite important improvements in instruments and methods are constantly being effected... Were it not for the demands of Amateurs, such manufacturing concerns would not exist and advance in the art would be checked". Finally came the continental comparison and perhaps the clinching argument: "That the French authorities recognise the force of these consideration is evidenced by the transmissions of speech and music that have already commenced under Government auspices from the Eiffel Tower. It is understood that it is intended to make these a regular feature like the time signals and meteorological report and it will be somewhat lamentable if England, where Wireless Telegraphy originated and whose Greenwich time is the time for the world, but who sends no wireless time signals, should again fall behind other countries by reason of failure to move the events". In these final sentences we can hear the words of Frank Hope-Jones on one of his favourite subjects. It was, after all, Hope-Jones who later established an accurate system of 'pips' at the B.B.C. He was difficult, arrogant, and extremely energetic and he knew how to get results. At the third Annual Conference of the Affiliated Societies held in January 1922 and within a month of the Petition landing on the desk of the Postmaster General, it was announced that the transmission of calibration waves and telephony programmes for half an hour each week had been authorised. At the request of the Wireless

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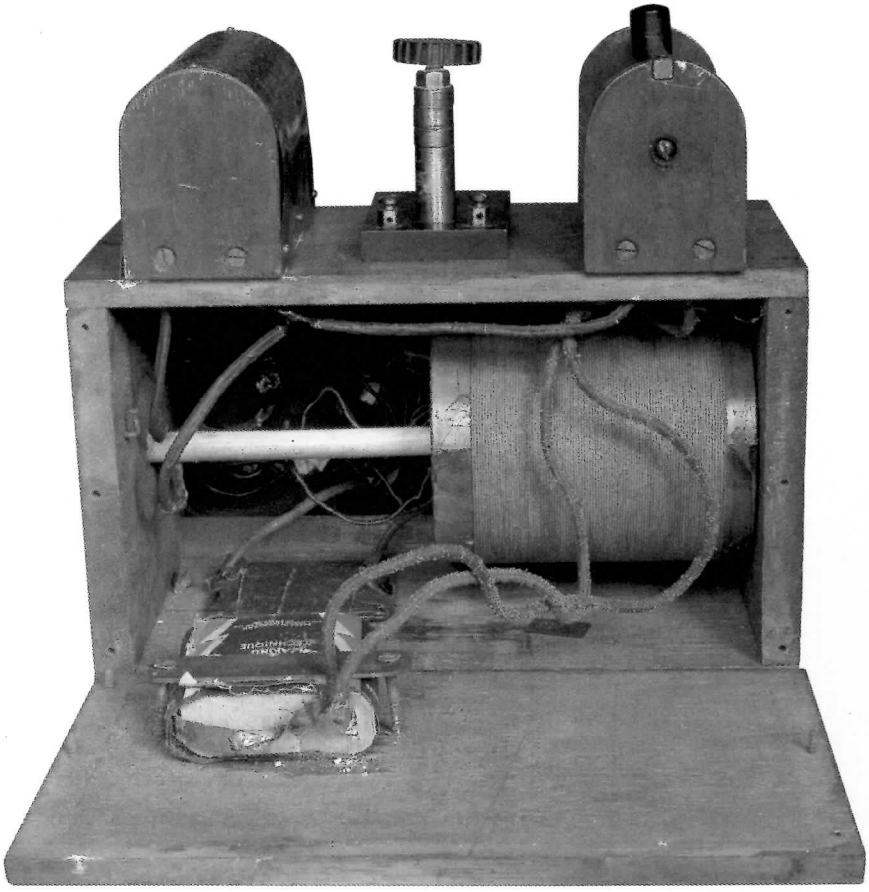

Above: inside the amateur-made pre-broadcast crystal set

You may be interested to know that it has quite a history. I was once offered 2 wives, a goat and 2 handfuls of Wichety grubs for it by an old Chief in New Guinea.

Society of London the Marconi Company undertook to provide this service from 2MT at Writtle near Chelmsford in Essex. It made Peter Eckersley famous as an entertaining and informal genius, quite apart from marking him out as the future Chief Engineer of the B.B.C. By the time the final Writtle transmission had been made on the 17th January 1923, the B.B.C. was in operation from 2LO and there can be no doubt that it resulted from the efforts of radio amateurs, scientists and Companies in and affiliated to the Wireless Society of London.

It was at the Writtle Hut that the first AGM of the BVWS took place in May 1977. It is described together with a memorable photograph on page 20 of The History of the British Vintage Wireless Society.

By this time a dramatic change had also occurred in the organisation of wireless societies and clubs. On January 27th 1921 the retirement of Campbell Swinton as President took place at a meeting of the London Society. He had been succeeded by John Erskine-Murray a former pupil of Lord Kelvin, a past President of the IEE and a friend of Marconi. Kelvin's period of office was for one year and in his place he brought in as President for 1922, Admiral of the Fleet, Sir Henry Jackson. Sir Henry had in fact demonstrated successful transmission and detection of radio waves to the Admiralty before Marconi's demonstration to the Post Office. In October of 1922 Sir Henry received an acceptance to a letter he had sent inviting the Prince of Wales to become Patron of the Society which at the same time was in the process of a name change to the Radio Society of Great Britain. This formally took place on November 22nd 1922 and with it the Society we know today came into existance.

One other major event took place towards the end of 1922 which was to establish a pattern for the future. The Society held the first All-British Wireless Exhibition at which the public were able to view the products of the major manufacturers including components for the home constructor. During the exhibition concerts were broadcast from 2LO - the Marconi station in the Strand, and it was from this station that the B.B.C. began its role of public broadcasting on November 14th 1922.

Throughout the period from the formation of the London Wireless Club to the formation of the B.B.C the Wireless World was the official organ of the radio amateur movement in the United Kingdom, and is the prime source not only for the history of the development of radio and broadcasting in the UK but also a blow by blow account of the RSGB from its beginnings to the end of 1924. All the historical material I have covered here can be read between its pages. In addition, the story of the RSGB has been brilliantly told by John Claricoats in his book "WORLD AT THEIR FINGERTIPS" and BVWS members with an appreciation of radio history should try to locate a copy for their bookshelf.

And so to return to where I started at, with the BVWS stall run by Ian and myself at the Chalkpits on a day crawling with members of the RSGB. My own admiration of the part played by radio amateurs was first kindled on learning about the letter sent by Hope-Jones to the Secretary of the Post Office in which he referred to "the preposterous proposal of the Postmaster General to levy a tax or royalty on those who desire to listen to the International Service of Time Signals of the World from the Eiffel Tower in Paris and Norddeich in Germany". So when sometime in the 1970s I found a wrist watch in poor condition in a street market, I bought it for the single reason that it had the letters RSGB together with call sign engraved on its back. It was a chronograph (elapsed time recorder) incorporated with an otherwise conventional timepiece, and a pound or two did not seem much to pay for a nice object that as an amateur horologist I could restore to good working order. In addition, I could with a bit of luck discover its radio connection through the engraved call sign.

That anyway was the plan, but after restoration the watch stayed in a drawer for some years whilst I waited for the opportunity to meet a large group of RSGB members at a single occasion. This eventually happened in 1981 when, as explained above, Ian Higginbottom and I took an exhibition of early wireless to the Chalkpits Museum on a radio communications open day in order to promote the BVWS. I made a point of taking the wrist chronograph so that whenever someone wearing an RSGB badge passed by I could mention the watch with its call sign and try to trace its original owner. I could of course have used the offices of the RSGB directly, but for some reason no longer clear to me I preferred to try my luck at finding someone who actually knew him well. The photograph on page 40 of The History of the British Vintage Wireless Society shows that a fine day had dawned at the Chalkpits and Ian and I were able to look after the BVWS stall and enjoy excellent weather at the same time. Nevertheless, in spite of speaking to every RSGB member who passed by concerning the Call Sign on the chronograph, I continued to draw a blank and by the middle of the afternoon my hopes of tracing its owner were beginning to fade. Perhaps he had joined the ranks of the "silent keys".

Then at last a group of three elderly amateurs with experience going back very many years approached and miraculously one of them by the name of Mick said "I know Bob, I'm having tea with him tomorrow"! and "yes, he's getting on a bit but still going strong". I could hardly believe my luck as I explained the finding of the watch, my interest in its RSGB connection, and offered to return it if it had been stolen or mislaid. "Don't worry" he said, "I'll explain it all to Bob tomorrow over tea".

About a week later I got a letter which was so extraordinary that I will quote the relevant part of its content verbatim. Bob it transpires had been some years beforehand to Papua New Guinea as a communications engineer in connection with the installation of a system of radio telephones in the interior of the country and where land lines were not a practical proposition. He was wearing the watch at the time. He wrote to me as follows:

"I have learned from Mick about the watch that has come into your possession. You may be interested to know that it has quite a history. I was once offered 2 wives, a goat and 2 handfuls of Wichety grubs for it by an old Chief in New Guinea. It was a beautiful timekeeper,

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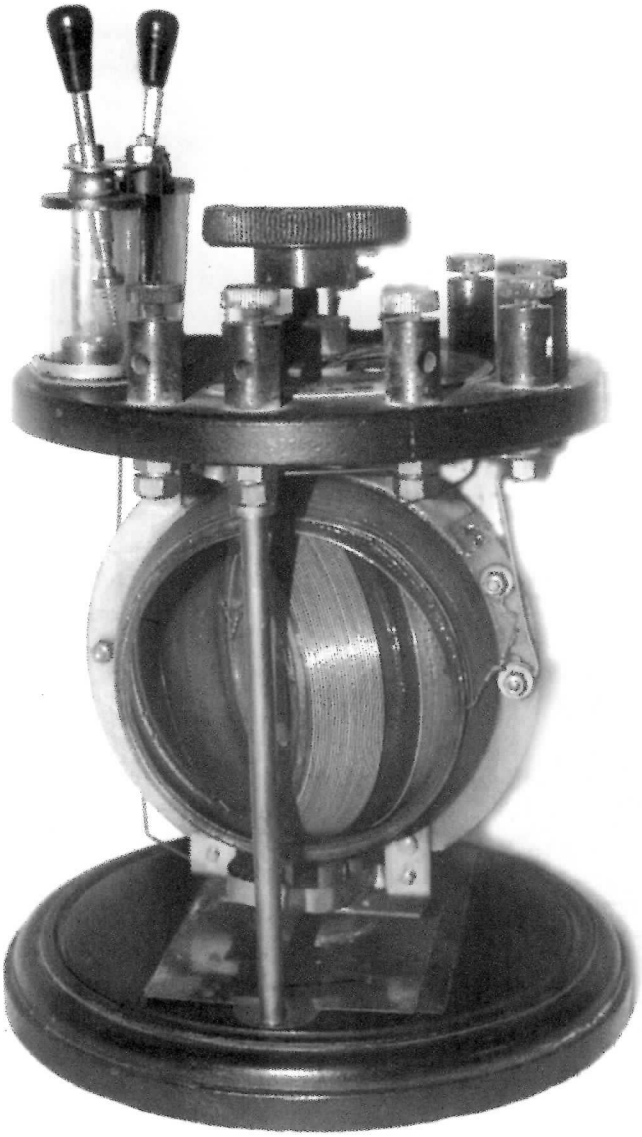
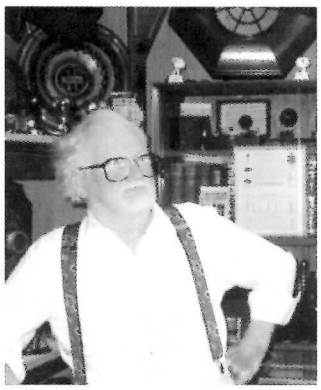


The Clydelco Crystal Set

by Mike Field

The crystal set shown in the illustrations briefly came into my possession recently. Called (I assume) the Clydelco crystal set, it was obviously made in the 1922 - 1924 period as it has the well known Postmaster General's approval and was given the registered number 871. It was made by the Clyde Electrical Company of Glasgow but in spite of considerable effort I have been unable to find out anything about this company. Maybe other members can shed some light.

As can be seen it features a conventional variometer circuit except that the two vertical crystal detectors are wired in parallel and are not switched as might be expected as, for example, in the BTH twin crystal receiver. The only other somewhat unusual feature is the home-made capacitor wired across the earphone terminals. This can be seen in the photograph above at the base of the receiver and consists of two copper plates separated by a sheet of mica.



Duncan Neale who died on the 31st of March at the age of 76 joined the BVWS in its early days and remained a great supporter and constructive critic throughout. His last letter to me was written three days before he died and was characteristic in its enthusiasm and interest in the Society. I shall always be grateful for his personal support during my two periods as Chairman of the Society, particularly during those difficult times which beset most organisations. Although Duncan had been unwell for some years with sarcoidosis his death was unexpected and came as a great shock, not only to me, but to those BVWS members who knew him and appreciated his generous and straightforward nature. The loss to his wife Marjorie is unimaginable and on behalf of all who knew him I express our deepest sympathy.

The Duncan Neale Collection

Auction at Dreweatt Neate's Salerooms, Donington Priory on 13th October 1999

An Appreciation of Duncan and Auction Report by David Read, auction photograph by Terry Ransome, Photograph of Duncan Neale and his collection by John Chapman.

Duncan was a professional engineer who built up a successful business in the design and manufacture of ultrasonic machines, and after the sale of his business he continued as a private consultant in ultrasonics until he finally retired. Like many of us with a strong dose of technical curiosity, he first became interested in wireless in childhood when building crystal sets, and started to collect seriously in the 1970s when street markets were still a fruitful source of bargains. By 1977 Christie's South Kensington was beginning to include some important wireless items in its Mechanical Music sale with Christopher Proudfoot the specialist in charge. For example in June 1977 a Tingey No.2 Cabinet Set was knocked down to Rupert for £700, an absolutely astronomical figure for a radio item at that time. However, a high price means a high underbidder and it was becoming clear that there was a body of collecters - like Duncan - who were interested in wireless history and could discriminate between run-of-the-mill manufacturers and firms such as Tingey which grew out of the very origins of the subject. Like McMichael (call sign 2FG), Tingey (call sign 2LW) was a radio amateur with a radio business before the birth of broadcasting (See my article on the RSGB in this issue of the Bulletin). The rise of interest accelerated after the joint BVWS/V&A Autumn Exhibition in November 1977, and Christie's at South Kensington became a regular venue for interesting wireless items. Most people with an interest in the subject made their way there to view the opportunities, and there it was in the late 1970s that I first met Duncan Neale and got to know him well. At one of Christie's sales a particular item is indelibly stuck in my memory since I wanted it rather badly; it was a Sterling Primax pleated diaphragm speaker. The diaphragm was gold painted as usual but, in this example the cast support and base were not the expected matching gold colour but a polished steel finish, perhaps plated. It was also in its original wooden box. My memory of Duncan is very clear in this instance because I was outbid by his greater determination. It was through these auctions at Christie's, and meetings with BVWS members with similar interests, that Duncan decided to join the Society.

Viewing the Dreweatt Neate sale of Duncan's collection on the 13th of October this year I came face to face with the same Primax speaker, a little scruffier than when I saw it at Christie's, but still with its original wooden box. Here was my second chance in about 20 years to buy it! Also at the Dreweat Neate sale was Christopher Proudfoot the specialist in charge of this area of business at Christie's who sold the item when I first saw it. In a friendly chat he explained that he was there to see how the transmission of the sale on the Internet in association with www.theauctionchannel.com would go as far as live bidding was concerned. It is interesting that a provincial, albeit substantial and very long established (1759), auctioneer should be setting the pace with respect to use of technology, and sensible that the very much better known firm should be there to observe the outcome.

Duncan Neale was not just an avid collector but someone with a real curiosity and interest in the history of wireless and broadcasting. This historical interest was reflected in the many important books that he collected including an uninterrupted run of bound volumes of Wireless World from Vol.1 in 1913 to Vol.65 ending in December1959. His choice in hardware was concentrated, as one would expect, in pre-broadcast and early BBC period items with PMG registrations, however, his taste was pleasingly catholic and his collection included some splendid communications receivers as well as a remarkable array of horn loudspeakers. Walking round the sale-room was an educational experience since it was clear that one was viewing one of the finest collections of early wireless in the country. Also sad that a death must so often take place before treasures are again dispersed amongst the community of collectors and that many of these will inevitably finish up outside the U.K.

The items in the sale represented the majority of his collection and as one might expect the auction comprised a mini-BVWS meeting. I expect that many members will have ordered a catalogue out of interest as a picture gallery and a source of reference so I will touch only on highlights. The hammer price is shown in brackets and attracted the usual buyer's premium of 17.5% including VAT.

Proceedings started with crystal sets and here there were many unusual items in fine condition. Three receivers were of circular form: an OTB (£250), Priestly and Ford (£270) and an Ericsson (£90). An Abbiphone Type CRO with PMG number 492 measured 1in. x 1.5in. x 2in. and was one of the smallest crystal sets I have seen (£160). "Benchmark" crystal sets included a BTH Bijou, (£170); a BTH twin crystal, (£270); a

Top of the bill and well illustrated on the cover as well as inside the catalogue was a Marconiphone V3 in a sumptuous japanned cabinet with figures in landscapes with flowers, insects and birds. Such cabinet decoration was not unknown at the time but a note with the set pointed out that the work of japanning the cabinet was actually done in 1982!

Rexophone twin crystal, (£380); a Millett Crystal Receiver - Marconi double detector type - (£450); and a Gecophone No.2 Type BC 1501, (£400).

Next came the Horn speakers of which there were about 45 in all. Included here were a TMC 'True Music' junior (£230); an Amplion Dragonfly (£200); a Western Electric of medium size with composition horn (£210); and a Sterling 'Baby' (£420), an astonishing price and sold live on the Internet.

After the horns came valve receivers including a Met-Vic 'Cosmos' VR4 without lid (£1150); a Burndept Mk.IV short wave receiver, (£380); and a Western Electric 44002 seven Wecovalve superhet and matching frame aerial. These two items were separated in the sale for, I imagine, strategic reasons on the basis that the buyer who bought the set would be committed to buying the rarer aerial. This proved to be true, the purchaser of the pair paying (£1580). Amongst 'benchmark' sets a Marconiphone V2A was knocked down for (£720) whilst its 2-stage amplifier made (£900) presumably because it is rarer, but nevertheless a reversal of the usual price relationship. A British Ericsson 3-valve receiver in outwardly marvellous condition made (£1300) but internally an intervalve transformer was missing and there were some wires going nowhere. However, the extremely rare plug-in coils were present and the set no doubt made an appropriate price. Top of the bill and well illustrated on the cover as well as inside the catalogue was a Marconiphone V3 in a sumptuous japanned cabinet with figures in landscapes with flowers, insects and birds. Such cabinet decoration was not unknown at the time but a note with the set pointed out that the work of japanning the cabinet was actually done in 1982! The quality was such that many who viewed it thought it must be a restoration, however, later enquiries established that it was indeed done from scratch onto an original cabinet by a specialist in this art; in any event it made a handsome (£3000). Duncan Neale bought the set already japanned and knew when it had been done, so the set though curious was not an attempt to fake. There had been no jiggery pokery.

Amongst pre-broadcast items I particularly liked a Transmitter No.1 made by the W/T Factory at Southgate. It was in superb original condition and still had the associated Sullivan hot-wire ammeter in place, (£1250). It is a close relative of the aircraft version made for the R.N.A.S. and R.F.C. (See my article in the Spring 1998 Bulletin, pages 16-18). A fine Mk.III Tuner manufactured by ATM had all its spare crystals still in place together with an interesting (though incorrect) watch in the holder, (£1750). There were also several very nice items of test equipment, two S.G. Brown Post Office microphone amplifiers and a splendid large early Morse key under a bevelled glass cover with send/receive controls. This item was sold with two lesser keys and the lot made (£280). Later on I heard a crusty gent complaining in a loud voice that it was ridiculous that a mere key should make this sort of money, not realising I suppose that there is a strong market for interesting keys, particularly on the continent and in the USA.

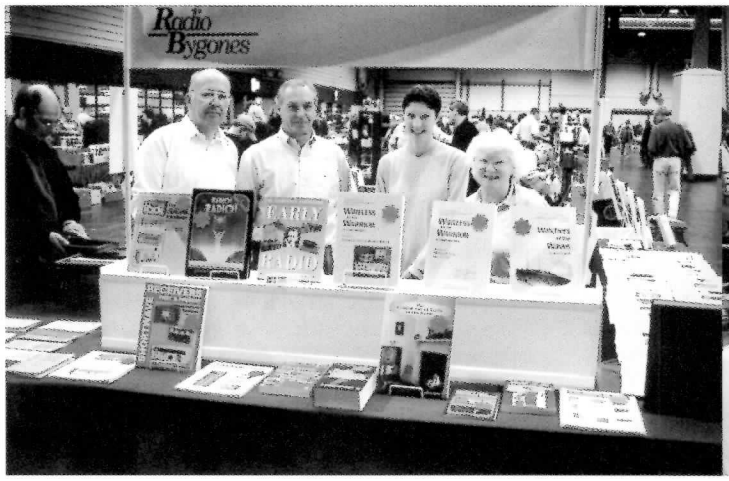
Certain lots of a miscellaneous character comprising speakers of various sorts were grouped towards the end of the sale. In here amongst Amplion Cabinettes and BTH balanced armature cones in brown bakelite was the Sterling Primax that Duncan outbid me for at Christie's in the late '70s as already mentioned. In spite of everything I was in the end not tempted as I had acquired another in the intervening years. After these came the communications receivers notable amongst which were an AR 88D and a mint example of the important Racal RA 1218 with digital readout. This latter was, I suspect, an example of the earliest generation of receivers to employ the Wadley loop technology. Both sold for (£180)

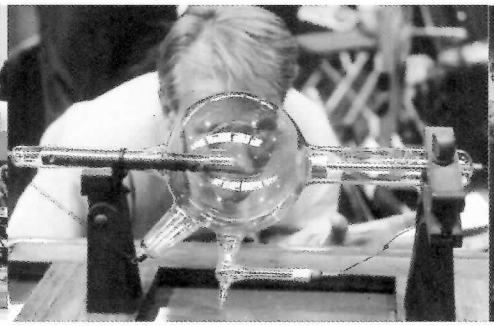
The auction ended with the collection of books and I have already mentioned the run of Wireless World. These were mostly sold in lots of two well bound

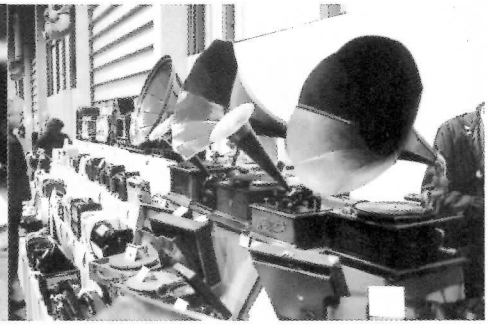
continued on page 40

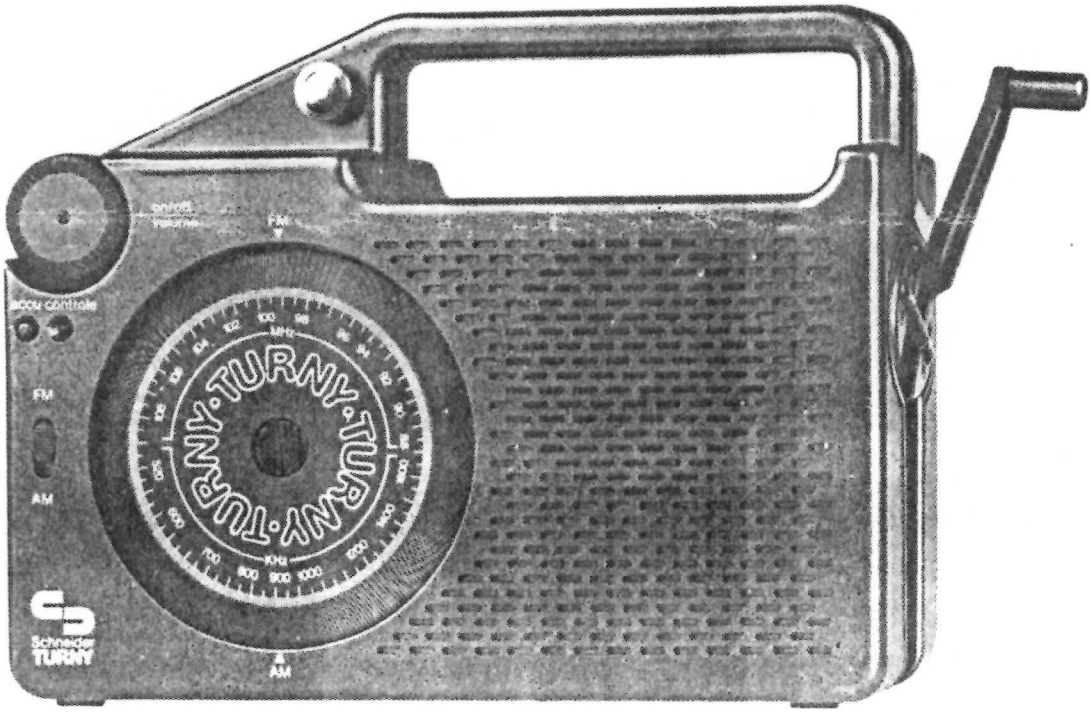
NVCF Sunday 24th October 1999

photographs by Jonathan Hill









My Wind-Up Wireless

The Schneider "Turny"

by Geoffrey Dixon-Nuttall

About ten years ago I bought one of these, mainly as a joke. It is not clockwork, like Mr. Bayliss' masterpiece, but the handle turns a generator, which charges up the battery.

As you can see, it is a very odd shape. The handle folds up into a recess in the right hand side when not in use. The whole thing seems to have been actually made in Hong Kong or Taiwan, although it is nominally made in France. There is a bracket on the back, apparently so that you can fasten it onto your belt, although the plastic is so fragile (see later) that this is not a good idea. If you don't want to bother with the handle, there is a socket, also on the back, which re-charges it from the mains.

The volume control and on-off switch is in the left hand corner, and the thing underneath is a battery charge' indicator. (The instructions say "when the accu is sufficiently charged for the orthophonic reproduction, the red diode is illuminated when the key is pressed.")

The set receives MW and VHF. I have to confess, although it is very badly made, that the VHF performance is really rather good. The dial, however, is a con. It is calibrated carefully in equal graduations, which in fact do not indicate anything useful. Numbers here and there show you roughly where you are.

I think it is made in Hong Kong rather than Taiwan, as the quality control is nothing much to boast of. Mine contained a dry joint which made it very intermittent, and another one which I got for a friend developed an off-centre speaker. He also broke off the winding handle, which I thought showed over-enthusiasm, until mine broke off too. It seems that the plastic is not really up to the job. I have cemented it together with a metal pin insert, and hope it doesn't go again.

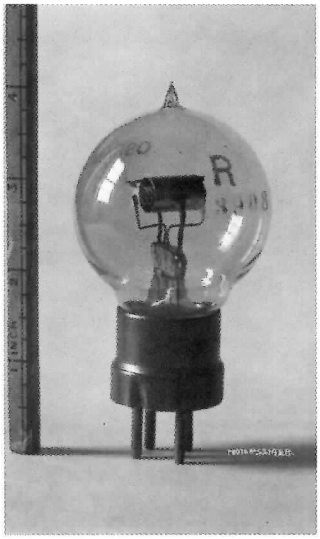
While I had the set apart I noticed that the MW ferrite rod is vertically mounted, which is a novelty. This means that you cannot turn the set round to remove an unwanted signal, but the tiny rod doesn't pick up all that much anyway. The printed circuit is dolloped with that Oriental goo which they always use to stop the components wandering about in transit. Our service department called it "bat droppings".

'The printed circuit is dolloped with that Oriental goo which they always use to stop the components wandering about in transit. Our service department called it "bat droppings".'

This set is not as efficient as the clockwork one. It roughly plays for ten times the amount of time you spend winding it up, so if you want ten minutes music you have to spend one minute winding. This is not really of much use, but provides exercise. The best bet is to forget all about the generator and charge it from the mains, when it becomes quite a useful portable. The quality isn't much, but it makes a cheerful noise from its 3" speaker. I don't think it is all that orthophonic, whatever that may mean.

The batteries are four pen cells. The quiescent current is about 20 mA, which is reasonable, but of course this goes up to about 500 when you wind up the wick.

This is one of those products which makes one wonder how it ever was thought a good idea to put into production. You may laugh at the clockwork radio, but this one is much sillier. The only use I can think of for it would be if one was on a desert island and dedicated to "The Archers".



The M-O Valve Company was one of the world's great companies. Not large in physical size nor mighty in financial muscle by modern standards but important in its contribution to science, technology and industry over an extended period of time.

M-OV was born of famous parents in exciting times. Its history covers 100 years, three generations, two world wars and the great developments in broadcasting in the post-war periods. The story is intertwined with Marconi, EMI, Osram, RCA and the GEC itself over virtually the whole period of electronics. Its enormous contribution to technological achievement is marked by a long series of classic valve designs and the special relationships these helped to forge with all the great institutions of the time, the armed services, the BBC, and the Post Office.

Marconi Osram Valve - extracts from "The Saga of Marconi Osram Valves"

Part 1: From the Beginning, the story up to 1919

by Barry Vyse

In the history of M-OV, we include the history of the extended family of organisations operating on, and associated with, valve-making on the Hammersmith site including Robertson's Electric Lamps, from which it all started, Osram which first took up valve making and which supplied so much technology and financial support and the Hirst Research Centre which was spawned and brought up by M-OV at Hammersmith before moving to Wembley, as well as M-OV itself. It is quite a story, one that is to be told in fuller detail in a new book "the Saga of Marconi Osram Valves" to be published later this year. What follows is a brief outline of the long, distinguished performance played out at the Brook Green Works, Hammersmith.

George Jessop - associated with M-OV for over 90 years!

One reason M-OV punched so much above its weight was its involvement in the invention, design and manufacture of those critical, high-tech devices that made all the grand telecom, broadcast and radar systems possible. Theirs was the world of device physics, materials technology, production engineering and individual genius necessary to the generation of the vital active components that tend, so often, to be overlooked in the glare and glamour of the operating system.

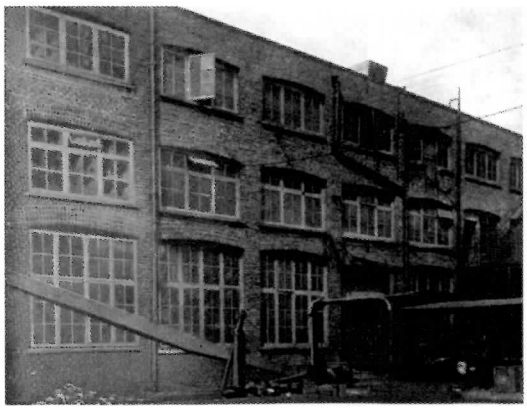
The story has a sub-plot. George Jessop, my colleague and co-author, joined the Company of players at Hammersmith in 1926 following in the footsteps of his father, Joseph, still an active member of the cast at the time, who had joined the same august band in 1906! Indeed, so closely are the Jessops bound up in the plot that George and his family not only performed at Hammersmith but lived on the same site. For these reasons our history has, perhaps, a more personal perspective than might otherwise be the case.

This brief history of M-OV, and its contribution to the science of electronics through its valve-making activities, is to be told in three articles. This first covers the background to the formation of the Company and its activities leading up to, during, and just after the Great War. The second article will cover the inter-war years, the period of the great development in wireless broadcast and the third the second world war and post-war periods which saw such enormous and crucial advances in valve technology.

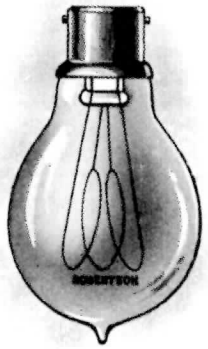
Valves - the Heart and Soul of Wireless

These articles are about M-OV and valves (tubes as they are less descriptively known in the United States); more specifically about wireless valves. It could have focused on the development of valves for television or radar or scientific instruments, because M-OV was

The original hammersmith site



THE ORIGINAL WORKS.



A Robertson carbon filament lamp

CJ Robertson

MR. CHRIS. WILSON,
THE GENERAL MANAGER OF ROBERTSON ELECTRIC LAMPS, LTD.

Chris Wilson - the tough but kindly manager of M-OV - Osram

prominent in all of these and each would have been equally valid. We have chosen wireless because that is where it all began.

Because of wireless, the world for ordinary people would never be the same again and wireless was made possible, at least as we know it, by the invention and development of valves; the hi-tech devices of their time that drove the state-of-the-art in electronic equipment; valves like the Type R, DER, S625, PX4, KT66 and MH4.

In the Beginning was the Lamp

What is a valve or, as the Americans would say, what is a tube?

In the context of this article, a valve would probably be defined as a "thermionic vacuum valve". As this description implies, a device might well be called a valve if it had a vacuum envelope, (probably made of glass), with a hot filament inside it capable of emitting thermionic electrons. Ah, you might say, such a description could just as easily describe a light bulb. You would be right; in essence the only difference between a lamp and a valve is that the valve would have one or more additional electrodes inside the vacuum envelope to which electrical voltages could be applied for the purpose of extracting electrons from the cathode region and causing a current to flow. On the basis of this rather obvious similarity, it would not be surprising to discover that valves and lamps had evolved from a common ancestor, and so it turns out. In fact, the association between lamps and valves and the mutual support offered by the common technologies, is particularly relevant to the story of M-OV as we shall see later. Indeed, I am convinced that an archaeologist digging over the site of M-OV would find not only remains of whole generations of valves and lamps lying side by side but also traces of the missing link. Is it a lamp or is it a toob?

As it happens, lamps came first and laid the basic technological foundations. Valves emerged later, almost by accident, in the course of scientific investigations into failure mechanisms in lamps. Thereafter, lamps and valves continued to develop, side by side, for the next eighty years.

Robertson's Electric Lamps

The story of M-OV begins with C J Robertson, an engineer, entrepreneur and contemporary of the much more famous inventors Joseph Swan and Thomas Edison whose experiments in the 1860s and 1870s resulted in the invention of a practical incandescent lamp.

Here is an extract from the Economist, Dec 27th 1879

"The most important feature of the week has been the renewed fall in Gas Securities; indeed it seems as if another "scare" has set in. Several telegrams concerning a new invention of Edison's have appeared, and probably to these the fall is attributable."

In England, C J Robertson and his collaborator Sir George Lane-Fox, later to become rivals, took Edison's invention very seriously. Over the period 1879-1881 they worked together on the prototype development of carbon filament lamps and manufacturing techniques. By 1883 Robertson was ready to continue the work on a somewhat larger scale and established a small lamp-making facility at Brook Green, Hammersmith. The building had been a carpet cleaning factory and was situated adjacent to the Metropolitan Railway and close to an old brick works that had been used to supply the materials for construction of the local railway. Otherwise, Hammersmith was a well established commercial and residential area on the outskirts of London at that time.

The main entrance to the original factory was from Osman Road which led from Brook Green past the front of the old Hammersmith Police station to serve a row of small cottages adjacent to the railway and continued on round the back of the factory to intersect Lena Gardens. It was the very modest start to a great enterprise, "great oaks from little acorns grow".

George Jessop has a personal interest in the geography sketched out above and the changing face of the factory as it developed over the next thirty years because he and his family came to live in Lena gardens where he stayed throughout all his childhood days. The house, no 43, had been occupied by Chris Wilson, the Factory Manager, a tough but kindly Yorkshireman, up to the time that success in the business allowed him to seek grander accommodation. How the world has changed, for not only did the Factory Manager live virtually on the premises but was to be seen tending his allotment beside the factory early in the morning before the start of work. Joe Jessop, as a respected member of Robertson's staff, was in a position to take advantage of the situation when Wilson left and moved into the house with his family and Boy George.

It is hard to believe that only 100 years ago lighting in homes and offices around the world was achieved by gas light in the towns, and oil lamp or candles elsewhere. Admittedly, electric arc lamps had become established but these were complicated powerful lights quite unsuitable for domestic illumination. C J Robertson, in common with other entrepreneurs, saw the advantages offered by the new electric lamp technology and persisted in developing manufacturing techniques. In the eyes of people like Robertson, the new device offered a bright new future! He was certainly right in his assessment.

Enter GEC

Early production of lamps was severely disrupted here and elsewhere over the next few years as a result of claims of infringement of the Edison patent. In fact, Robertson actually left the country for the Continent during this period where he set up and ran several other factories. By 1893, Robertson was back in England bristling with big ideas. The date 1893 is significant because this was the date when Edison's original lamp patent lapsed. Robertson had returned to start up a collaboration with Hugo Hirst (who in 1922 lent his name to the Central Research Laboratories of the GEC) and Gustav Byng of the GEC (General Electric Company of the UK) which resulted in the establishment of a new Company and the opening of a modest new factory on the Brook Green site, Hammersmith. The company traded under the name "Robertson Electric Lamps Ltd" but was 50% owned by GEC, the other 50% of the equity being held by various private investors. Hugo Hirst became the Chairman and leading light, if you will forgive the expression, of the new company which was to become the jewel in the crown of the GEC as it expanded into a great corporation over the next fifty years.

At this stage, Robertson's Lamps should, perhaps, be considered an Associate Company of the GEC rather than a subsidiary, though GEC did not have any other lamp interests of its own, at least as far as manufacture was concerned, and the perception grew that Robertson's Lamps was the lamp manufacturing arm of GEC.

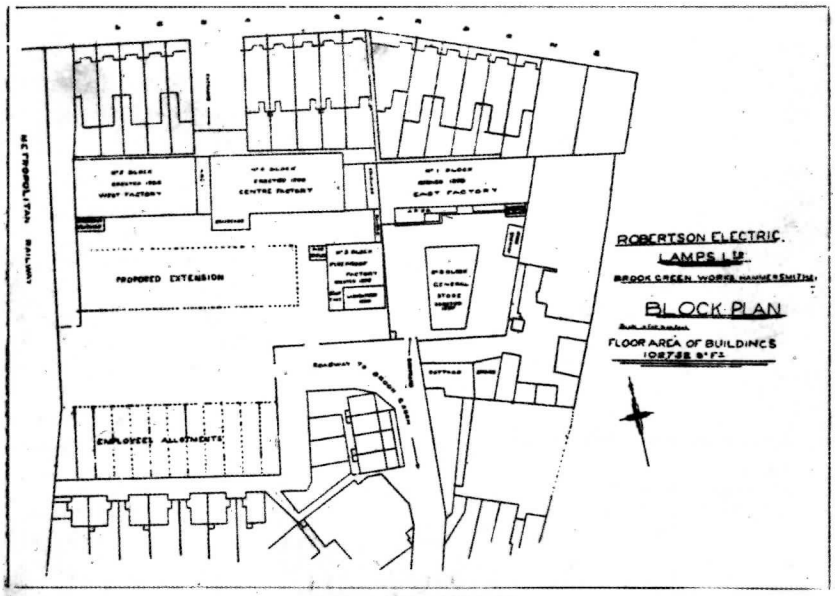
It should be remembered that GEC at this time was a very small organisation, far smaller than its American

Hugo Hirst - man of vision and outstanding entrepreneur

namesake controlled by Edison, General Electric of the US, and Thomson Houston. GEC had been founded as a Limited Company in 1889, as described in Anatomy of a Merger (1) and extracts from Hugo Hirst's lectures reproduced in an earlier edition of GEC Review (2), and in 1893 its main facilities were limited to a plant in Manchester making metal fixtures for electrical equipment and a retail outlet in London. The entry into lamp manufacture through its investment in Robertson Electric Lamps was, therefore, a major, indeed crucial, step for GEC who shortly afterwards made another important advance with the purchase of a glass factory in Leamington with the aim of securing a good supply of glass parts for the lamp business. So, one might note, that the history of the Hammersmith factory coincides to a large extent with the early history of the GEC itself.

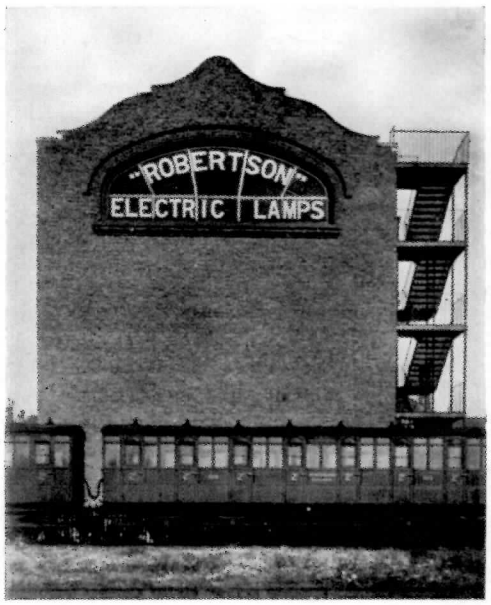
The original works of 1893 at Hammersmith became known in later years as C-Block. A fireproof building was added to the factory in 1898 which was later, c 1939, converted into the boiler house. A-Block was added in 1900 and B-Block in 1903. Photographs of the original C-block have survived. One interesting picture of the time is of Robertson's lamps being transferred to a van from the loading bay in A-block. The van was electric, as befits the industry, not unlike the electric milk floats of today but with wheels more resembling cart wheels than a modern pneumatic tyre.

C-Block and the other early buildings were relatively small, plain, rather insignificant industrial style buildings but remained in place and largely unaltered right through to the time the site was sold for development in 1988 following which they were demolished. However, even when C-block was dwarfed and surrounded by the main factory blocks constructed later, it was always clearly distinguishable from the rest; constructed in yellow London brick, it looked of a different age to its grander offspring. Even if this had not been the case, a knowledgeable visitor would have recognised this place of historical significance by the original sign for Robertson lamps, in the form of a large lamp bulb painted directly on the brickwork above the entrance to the old factory.



PLAN OF WORKS.

plan of site, 1904



END VIEW OF THE WORKS,
AS SEEN FROM THE METROPOLITAN AND SOUTH WESTERN RAILWAYS.

The view of Robertson's works seen from the railway

Development of vacuum device technology

Robertson's process for the manufacture of carbon filament Electric Lamps was immortalised in a charming book "From the Beginning" dating from 1905 (3). Since lamps and valves share a common ancestry, it may be instructive to investigate in a little more detail, how the Robertson lamp was made. Here is a quotation about the lamp from the introduction of the book,

"What is it? A small glass globe; a something inside that becomes white hot when current is switched on; an outer ring of brass or other material that answers the same purpose. Not much romance in that! Not much of interest even".

The lamp was already perceived as a simple domestic device; once invented, it is hard to understand why it took so long. In reality, the process involved 45 distinct, tightly-controlled and, in some cases, highly dangerous processes.

The filament consisted of a fine strand of carbon. Easy to say, but generating a material of the correct resistance and strong enough to withstand the rigours of every day life, presented a real challenge. In fact, the filament started off as cotton wool! The cellulose was dissolved then extruded and dried, cut to size and formed, carburized at very high temperature, graded, trimmed, mounted, flashed and so on and on. The filament was mounted on platinum wires which were used to form the seals to the glass vacuum envelope; an expensive solution. There were cheaper methods but these were subject to rusting or other forms of corrosion which resulted in deterioration of the vacuum and subsequent failure of the lamp.

The simple act of connecting the carbon filament to the platinum seals was a technological challenge, the materials are so different, the mechanical stresses high and the need for good electrical contact paramount. The problem was solved very effectively, but at great hazard, by flashing the filament to incandescent temperature whilst immersed in benzene! I wonder what today's Health and Safety Executive would have had to say about that.

A most important part was the vacuum. The slightest trace of oxygen would cause the carbon filament to oxidise and fall apart. Care to evacuate the bulb and to process it so that it retained a good vacuum after being sealed-off, was extreme and at the limit of the capability of the vacuum pumps of the day. The Robertson carbon filament lamp was, and had to be, a high vacuum device.

Making a robust, reliable and economic light bulb was not such an easy proposition! There were a lot of teething troubles and a lot of painstaking development work to complete. Nonetheless, with meticulous control of the manufacturing process it proved very successful. The manufacturing process took nearly two years to establish so the first production lamp only left the factory in 1895. However, in spite of the fact that the Robertson lamp was amongst the most expensive on the market, sales rocketed and the factory was producing four million lamps per year by 1904 - quite a performance. The emphasis on quality established with the lamp was to be a philosophy pursued throughout the

MOUNTING FILAMENTS. ROOM No. 1.

FLASHING THE FILAMENTS. VIEW No. 2.

PACKING THE LAMPS.

lamps in manufacture

THE "LAWNS," AT BRIGHTON, A POPULAR PLACE FOR VISITORS. LIGHTED BY "ROBERTSON" LAMPS.

INTERIOR VIEW OF L. & N.W. RAILWAY DRAWING-ROOM CAR, IN WHICH "ROBERTSON" LAMPS ARE FITTED.

Above: some of the more prestigious applications of Robertson's lamps.

Below: Osram factory 1911

Osram Works about 1911—from an old photograph

long history of lamp and valve manufacture on the Hammersmith site.

Note that by the beginning of 1904, the thermionic valve had still not been invented whilst, as can be seen by the above, many of the materials, technologies and processes that would be needed were already in place by virtue of the effort expended on establishing manufacture of the electric lamp.

Carbon filament technology held sway for about 25 years after Edison - Swan's original inventions. Such lamps served well but were relatively expensive, difficult to control and relatively inefficient in converting electrical energy into light - a lot of heat and not too much light. The search was on around the world for an alternative, more efficient, more economic material and Germany, with its great tradition in chemical and material science, was the focus of attention. Hugo Hirst who was German by birth and a naturalised British citizen, maintained close contact with his associates in Germany and kept in close touch with the developments taking place over there. When the breakthrough came, he was well placed to exploit it.

Osram - M-OVs First Parent

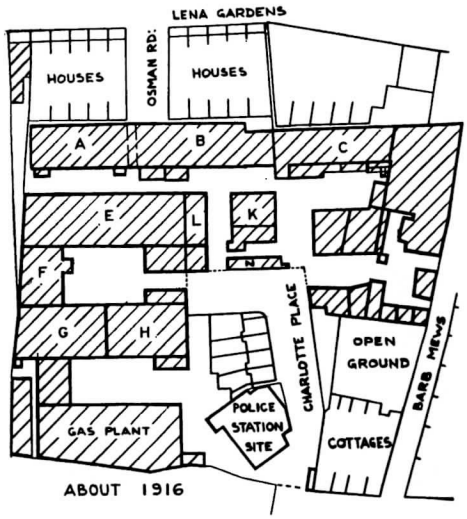
By 1905, the work on new filament materials was bearing fruit; materials based upon alloys of tungsten and osmium were emerging from Germany and Austria. Two such materials appeared to Hirst to be of special interest and he seized the opportunity of playing peacemaker between two rival organisations to set up a joint venture in the UK, to develop both types of lamp. A new Company was formed, to be held equally between GEC, Just and Hanaman and Auer which was to be established on the Hammersmith site alongside Robertson's. A large new factory was built and production was started in 1909. The Auer patent, based upon an alloy of tungsten, proved to have the right combination of resistivity, workability and mechanical stability at very high temperature. It could be drawn into a fine filament in very long lengths. The material soon proved the most satisfactory and became the established product. J&H was bought out but not before a new name had been coined - OSRAM - a contraction of OSmium-wolfRAM, the German words for the two competing refractory metals. The new Company, jointly held by GEC and Auergesellschaft, moved into full-scale manufacture of the new tungsten filament lamp.

Since both carbon filament and tungsten lamps were being manufactured by GEC on the same site, the lamp works at Hammersmith became known as Robertson-Osram and later as the Osram-Robertson Lamp Company Ltd. At the start of the First World War, the assets of the German Company were seized by the British Government and eventually purchased by Hirst on GEC's behalf in 1916 at which time "Robertson" was dropped from the name and the lamp Company at Brook Green, Hammersmith became Osram Ltd, a wholly-owned and very profitable subsidiary of GEC. Unlike some of his competitors, Hugo Hirst, highly entrepreneurial as always, had been quick to adopt the new filament material and, as a result, his Company had become immensely successful.

The original Osram factory of 1909, five stories high with large basement areas, was the building later known as H-block in the centre of the plot as shown on the plan on page 16. It was extended by a single storey building between it and the A-block, part of the Robertson factory. E-block was to be raised to the same five storey level as H but before this happened, a great fire broke out in H-Block. George remembers it well for two very good reasons. His father was in charge of the Factory Fire Brigade and in the front line trying to bring the blaze under control. Also, as a little boy of four, he remembers working his way up the iron fire escape of A-block until he was high enough to see over the top of E so that he could watch the drama unfolding throughout the night. It was a cold, damp November evening and by morning little George had caught a chill that was to turn into pneumonia and a very long and uncomfortable recovery, an all too common consequence in those times, years before the availability of antibiotics.

By the time of the Great War of 1914-18, the Osram factory had expanded enormously, to about 200,000 square feet not counting the cavernous basement

plan of Osram site, about 1916



an early Osram tungsten filament lamp of the vacuum type

early Fleming diode

areas, see the illustration, whilst carbon filament lamps had all but disappeared - but not completely. Osram continued to make Robertson style lamps, in relatively small numbers, right up to the end of the second world war, in 1945, long after the process had been discarded for volume domestic business. They had one special customer, the Royal Navy, who preferred the old design because carbon filaments proved more robust than tungsten particularly against shocks resulting from gun fire and explosions. The military could afford the extra expense.

The reproduction from a contemporary advertisement shows the sort of lamps that were being offered for sale around 1920. Not only was the factory very large by the standards of only ten years before but it was extremely profitable, aided, no doubt, by its membership of the great lamp cartels which were so fashionable at the time. The business was further bolstered by the acquisition of its local rivals, well known names at the time such as Pope's Elaster, Z Lamps and Britannia.

The Birth of Electronics

So much for the early history of lamps on the Hammersmith site. What about valves?

In 1904 John Ambrose Fleming, working at University college just a few miles from Hammersmith, invented the thermionic diode, see the illustration.

Actually, valves had been discovered more than twenty years before they were invented! It seems the discoverers did not appreciate what they had stumbled over. A quite extraordinary example of this theme of discovery and invention centres around the great man himself, Thomas Edison. His early carbon filament lamps, like all others, suffered, to a greater or lesser extent, from an ageing process known as blackening. As early as 1880 Edison noticed that the black deposit was not uniform all over the inside of the bulb but exhibited a clear stripe suggesting that it was caused by the shadow of the negative side of the filament as seen from the positive end of the filament (these were the days in which DC mains were being used). Intuitive reasoning suggested that carbon was being thrown off the positive end of the filament in all directions but that the stream was screened by the other side of the filament loop - hence the clear stripe. The explanation of this phenomenon took several years to arrive. However, in investigating the phenomenon, Edison had built special lamps incorporating a metal plate between the legs of the filament, presumably to try to screen one end of the filament from the other. This did not cure the blackening problem but he noticed that an electrical current would flow between one end of the filament and the screening plate when the potential on the plate was positive with respect to the filament but not the other way round. So, the great inventor had made a discovery but not, in this case, an invention. Actually, it is not true that he missed an invention, only that he missed THE invention because he did file a patent based upon this discovery, a device for detecting variations of voltage on power lines, but he failed to recognise that he had discovered a type of thermionic diode.

Fleming had also been investigating the "Edison effect" in lamp-like devices of the carbon filament type with an additional electrode but had set them aside. As early as 1883 he had identified the problem as a "molecular shadow"; he had recognised the basic physics of the problem. He also studied the "Edison" effect, as he named it, and extended the measurement to include alternating current and, in so doing, established the device as a low frequency rectifier.

In 1899, Fleming was recruited by the Marconi Wireless Telegraph Company Ltd as Technical Advisor and in 1900 joined the team working on the transatlantic Communications project. His studies concentrated on the detection of weak rf signals. In Marconi's wireless-telegraph system, a high power, high frequency wireless signal was to be amplitude modulated with Morse information and transmitted into the atmosphere. At the other end, the same, now weak, signal was to be detected (rectified) and the Morse data recovered. The detectors of the period were either Coherers or Magnetic and either very erratic or very insensitive and the operator listened to the signal through an ear-piece. Fleming set about trying to find a more effective substitute for the detector.

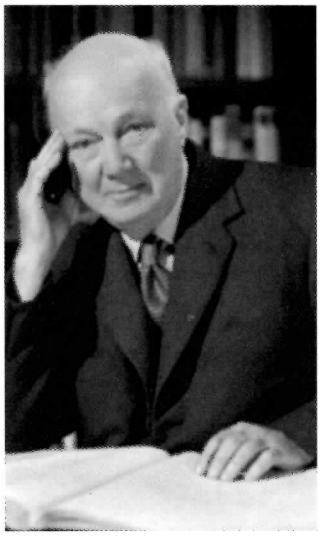
In October 1904, the idea dawned that it might be possible to apply the Edison effect to the solution of the wireless detection problem. He brought out one of the lamps he had been using to study the Edison effect - one with the additional plate between the legs of the filament - dusted it off, and within a few hours had rigged up a circuit to try out the device. It worked! He had transmitted a wireless signal over a short distance and detected it using the rectifying properties of the Edison-style Lamp. He had demonstrated that a thermionic device could be used as a detector at radio frequencies and had applied it to solve a specific problem. The diode detector had been invented. Electronics had been born.

Having made his invention, he immediately redesigned the device to optimise its performance as a detector and had samples constructed. These devices had a flat metal plate placed parallel with the plane of the filament. His patent, no 24,850, was filed in November 1904 and granted in September 1905. As early as June 1905, the Marconi Wireless and Telegraph Company was using Fleming diodes in the Marconi-Fleming wireless telegraph receiver.

The early valves employed a 12 volt carbon filament. To the casual observer it must have looked just like a light bulb. Indeed Fleming actually referred to it as a lamp. Soon he discovered that a 4 volt filament was just as effective as a diode detector and consumed much less power. From 1906 onwards, Fleming's valves were constructed with tungsten filaments - clearly following the trend in the lamp world.

Fleming went on to invent full-wave rectification, 1906, using two valves. He also discovered how to increase the sensitivity of his diode detector by forward biasing.

In November 1906, Lee de Forest in the US added a third electrode to his version of the Fleming diode. The third electrode was in the form of a second flat plate on the other side of the filament. This was not new but de Forest brought out the connections to the two anodes separately and claimed that the structure could be used as an amplifier. He was probably wrong but it did not matter because only a couple of weeks later he decided to place the third electrode in the form of a "Grid Iron" between the cathode (filament) and anode (positive plate). The device, which he called the Triode Audion, had been invented bringing with it the possibility of amplification and, as a consequence, the generation of high frequency electronic signals by oscillation. His patent was filed in Jan 1907 and US patent No 879,532 was granted in February 1908. Actually, there appears to be no evidence to prove that these early triode audions were capable of amplification though they certainly did have the potential for amplification, a



Captain Round - a dominant figure in the valve world from 1910-1930

Round valve

fact recognised by Dr Arnold of Western Electric in the USA. With great dedication and professionalism, backed by the very considerable resources of AT&T, he had by about 1913, transformed this brilliant but temperamental, rather gassy, hand-crafted, prototype with short life and limited performance into a well engineered, repeatable, long-life high vacuum device with X5 gain and over 4,000 hours life.

The invention of valves appears to have had very little impact in the UK until about 1910. This is probably because the audion at this stage had little or no amplifying capabilities and because alternative solutions, particularly the crystal detector, had been found for the most pressing need - detection of weak wireless signals. The situation changed materially after 1910 as the need for better wireless communications emerged.

Marconi - the Other Parent - Captain Round

Guglielmo Marconi had invented and demonstrated wireless in the late 1890s and had founded his company, Marconi Wireless Telegraph Company Ltd, in England. This Organisation became the dominant world force in wireless, establishing communication between the UK and USA in 1901 and between the UK and Australia in 1918.

Marconi's key man in the valve world was Captain H J Round who was watching the development of electronics world-wide and was to have a profound impact on events in the UK. In 1911 he came up with his own design of triode which became known as the Round valve, see the illustration, and which dominated the scene in the UK for the next few years. The Round device was one of those rare, beautiful creations that possessed a "personality" which long outlasted its usefulness. It was, and remains, quite unique. Unlike the audion, it was quite definitely gassy. In fact, its performance depended on its being gassy, probably nitrogen, and since operation showed a tendency to "clean up" the gas by a type of getter action, performance was maintained by heating up an asbestos plug enclosed in a specially constructed tubulation at the top of the valve. Any form of heat would do so long as it was applied with caution! The heat drove off gas from the asbestos thus restoring the gas pressure and the performance of the valve. The Round valve had another unusual feature; the grid was in the form of a fine wire mesh with a top completely enclosing the cathode which was of the oxide coated type. The valve was large but had excellent performance with high gain, far higher than anything else available at the time, and good power handling capabilities. Like all "soft" devices, however, it was difficult to manufacture and temperamental to operate; the "black art" was lost from time to time even by the most skilled craftsmen and operators.

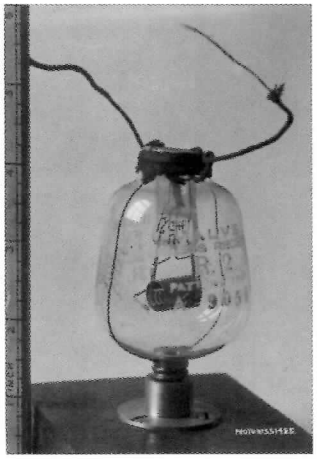
The Round valve evolved into several different versions suited to various applications and was applied widely, notably as an amplifier at audio frequencies in the first UK telephone repeaters and by Marconi in wireless sets in both high frequency and audio amplifier circuits and as the transmitting device. At the start of the first World War, it was being used by all three of the UK armed services.

War - the R-Type - First Production Valve

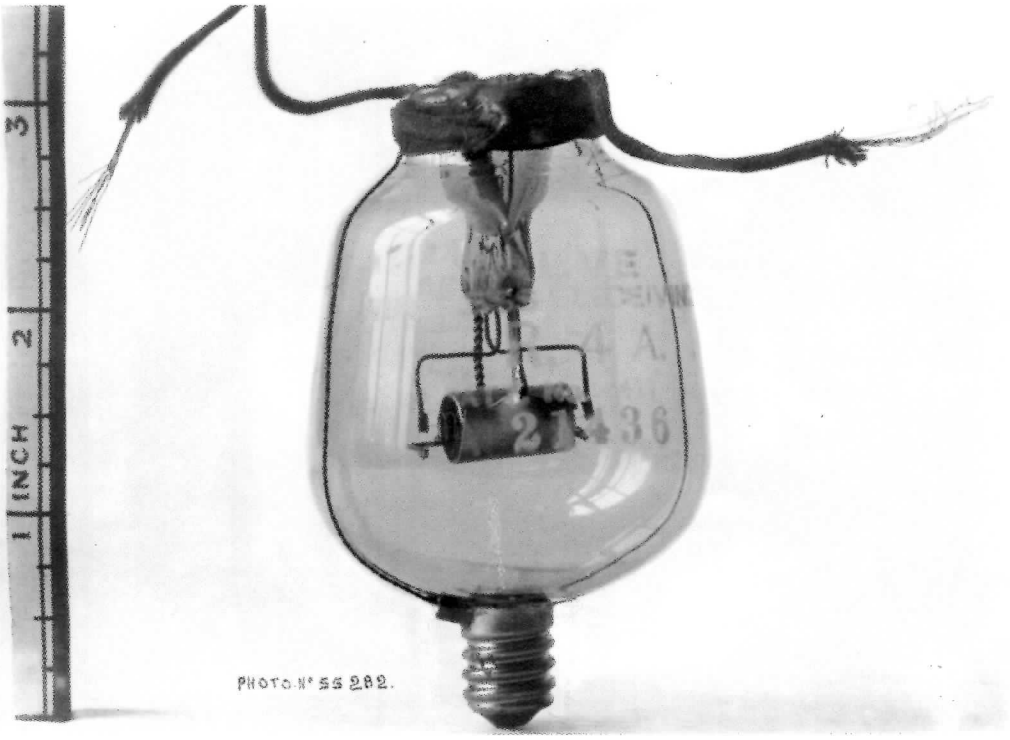
In the period approaching 1914, tensions were building around Europe. By 1914 Osram was already the premier manufacturer of lamps in the UK, making several tens of thousands of lamps per day and with a reputation for high quality. In all probability Osram was aware of the scientific achievements taking place in the area of valves and was becoming progressively more involved in development and pilot manufacture as practical devices started to emerge. Certainly, Osram possessed the materials and technologies needed for this activity, though there is little remaining evidence of this involvement which remains surmise. There is absolutely no doubt, however, of the level of involvement after the onset of war. Improved communications for all three armed services was high on the agenda. The MOD needed a manufacturing source of high quality, reliable valves rather than laboratory samples and Osram answered the call. By 1916 Osram had become a major manufacturer of valves.

The valve that was pressed so successfully into production was based upon the French TM design. Samples of the latest audion had been worked on by the Lamp Company Grammont at Lyon supported by an impressive group of physicists including Brillouin and Bloch, quite a team. This collaboration resulted in a new, highly characteristic, design with cylindrical, horizontally mounted anode. Unlike the Round valve, the TM was a hard vacuum device which in some versions could be operated at high anode voltage as an oscillator in transmitter circuits. The valve used a tungsten bright emitter filament and an entirely new and highly satisfactory four pin base.

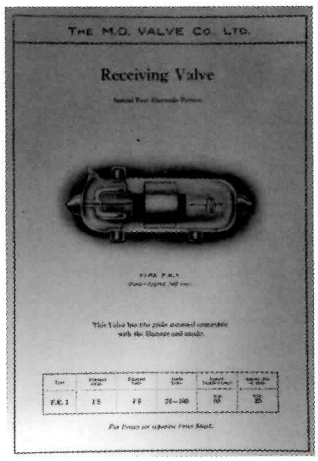
The excellence of the mechanical design of the French TM valve was recognised by the British. B.T.H. in particular were active in this area and used this same structure in a design which became known as the R-



R2 valve



R4A valve



FE1 Receiving valve

type. This was the valve that was productionised and manufactured in large quantities by the Osram-Robertson Lamp Company from 1916 onwards. B.T.H. also designed a soft valve, filled with low pressure nitrogen and later helium, based upon the same French TM mechanical design, called the R2 and various versions of this valve were also manufactured in large quantities by the Osram-Robertson Lamp Company from 1917 towards the end of the war. So, strangely, Osram was manufacturing hard and soft versions of the same valve for a period of 1-2 years. As it turned out, the R2 and its close relation, type D, which came a little later and which was used by the Air Force as a detector, were to be the last of the soft valve designs. By 1919 the R-type had been adopted by the British in preference to the Round and R2 valves as a basis for all future designs of amplifying valves. Hard vacuum technology had won the day against soft designs not because of performance, multi-stage amplifiers were required to replace a good single stage soft valve, but because of manufacturability and ease of use.

The special relationship between Osram and the Military, forged at this time of national emergency, remained a feature of the Company's operations right through the intervening years, through the second World War and into the post war period.

Type.	Volt	Amp	Detail	Vacuum	Maker
R	4-6.0	0.84	Triode	Hard	Osram
R1	4-6.0	0.84	Diode	Hard	Osram
R2	3.5	1.2	Nitrogen filled	Soft	Osram
R2A	3.5	1.2	Helium filled	Soft	Osram
R4	3.8	1.0	Triode	Hard	BTH, Osram
R4A	3.8	0.65	Triode	Hard	BTH, Osram
R4B	3.8	0.65	Triode	Hard	Osram
R4C	3.8	0.65	Triode	Hard	Osram
R5	5.0	0.8	Triode	Hard	Mullard at Z Lamp Works, Osram
R5V	5.0	0.7	Triode, V- filament	Hard	Osram, based on V24 but fitted with acorn cap R6
No data			Triode	Hard	
R7	3.5-3.7		Triode	Hard	Originated by Mullard but also made by Osram as NR7A in special naval type cap

M-OV designed and manufactured a whole range of R-type valves as summarised in the table, each with a number of variations and each with some particular application in mind; R1 had the grid omitted for use as a half-wave rectifier. There appears to have been no R3 but, otherwise, the range stretched up to R7. The R4, for example, was designed with specially close grid-cathode spacing for use as the low-power oscillator in heterodyne receivers. The R5 was designed as a high frequency amplifier and was visually identifiable because the axis of the triode was mounted vertically. A version of this same valve, type C, was used by the Air Force in 1918 in the Marconi T10 receiver.

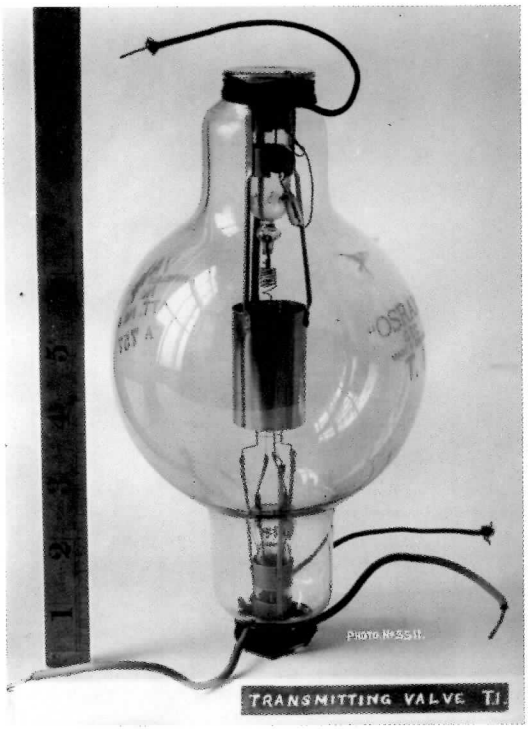
The electrode design of the R5 was based on the double ended V24 valve dating from 1916, and designed by Captain Round. At the time, the V24 was the state-of-the-art in high frequency performance. The strange, unique construction derived from the need to reduce the stray capacitance of leads and base connections to a minimum. Osram never made the V24 but M-OV a little later were very successful with developments of this valve, the high frequency detector type Q and its derivative QX which accomplished adequate gain up to 1MHz. All these valves were used widely by the Royal Navy in, for example, the Marconi type 55 amplifier, and were still being manufactured by M-OV up to 1937.

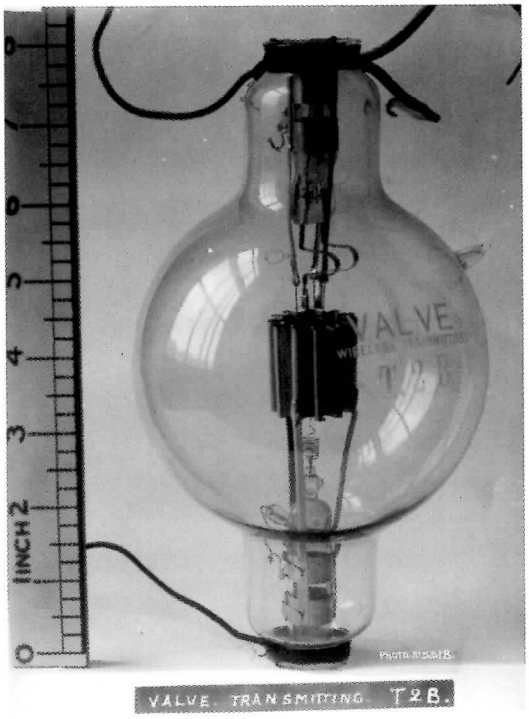
M-OV also took up manufacture of another class of valves designed by Captain Round as rf amplifiers which required further reduction of the internal inter-electrode capacitance. In this type, a fourth screen grid was introduced between the grid and anode. The valves, which incorporated a loosely wound additional grid, became known as the FE1 and its smaller offspring, the FE2. There was a later version FE3, in conventional bulb which appeared in the mid-twenties. These were the first valves to use a fourth electrode so Captain Round, in addition to all his other contributions to the new science, has a claim to the invention of the tetrode, a most important stage in improving valve performance at radio frequencies. When used in the Marconi type-91, four-electrode valve amplifying detector, these valves acted as rf amplifier, detector and audio amplifier all in the same envelope! So, in this application they were the harbinger of one further important development - the compound valve.

'Captain Round, in addition to all his other contributions to the new science, has a claim to the invention of the tetrode, a most important stage in improving valve performance at radio frequencies.'

High Power Transmitting valves

Brief mention has been made of the use of the R-type configured as an output oscillator for application to wireless transmission. It was used in this role in the WW1 Marconi Trench set Mk3. The valve in this configuration was capable of perhaps 10 watts of radiated power in long-wave. During the war, the military, the





T1 Transmitting valve: 1918 the first high power transmitting valve

Far right: T2B Transmitting valve

Welcome Home

Dinner

To EMPLOYEES of the OSRAM - ROBERTSON LAMP WORKS, who served with His MAJESTY'S FORCES during the Great War.

Chairman:
C. WILSON, ESQ.

CLARENDON RESTAURANT,
TUESDAY, MAY 20TH, 1919.

menu for dinner commemorating Osram employees who served during WW1

'M-OV (Osram) was known in the area as a good and caring Employer. Right from the beginning, the Company had a subsidised canteen, very important in those days, and a long-established policy on the provision of recreation facilities.'

navy in particular, identified the need for much greater power over a wide band of frequencies for longer distance communication. The centre of expertise for valve technology within the establishment became the Admiralty Signal School led by B S Gossling who later joined the M-OV team. They pioneered the early work into high power glass transmitting valves using bright tungsten emitters but lacked a manufacturing base. They also went out to industry and again it was Osram that responded. By 1918, Osram, in close collaboration with the Royal Navy, had designed and was manufacturing a whole series of classic, two-ended uncapped triode transmitting valves, the T-series and related devices, (similar types made for Marconi were given an MT number), with radiated rf power ranging from about 10 watts up to 500 watts all, in turn, state-of-the-art. These valves were the forerunners of the big transmitting valves that would be needed for broadcast in the coming decade.

The pace of progress was extraordinary. At an Exhibition held at Imperial College of Science, Kensington, by the Physical and the Optical Society, 7-8th January 1920 (4), M-OV presented a display of wireless valves. George actually attended this Exhibition at the age of 12, with his father. M-OV displayed no less than thirteen separate transmitting valves together with 6 related high power rectifier devices and six receiving types. They ranged from relatively low power devices like the BWO (British War Office) bearing a strong resemblance to the R-type and dissipating around 30 watts, to the 800 watt dissipation T7X which was operating somewhere in the 8 kilovolt region. All these valves used bright emitter tungsten filaments and most of the higher power versions took on the characteristic new body shape, two-ended valves with a large bulge in the middle and seal-off pips on the side. The anodes and grids were generally cylindrical structures, like larger versions of the R-type.

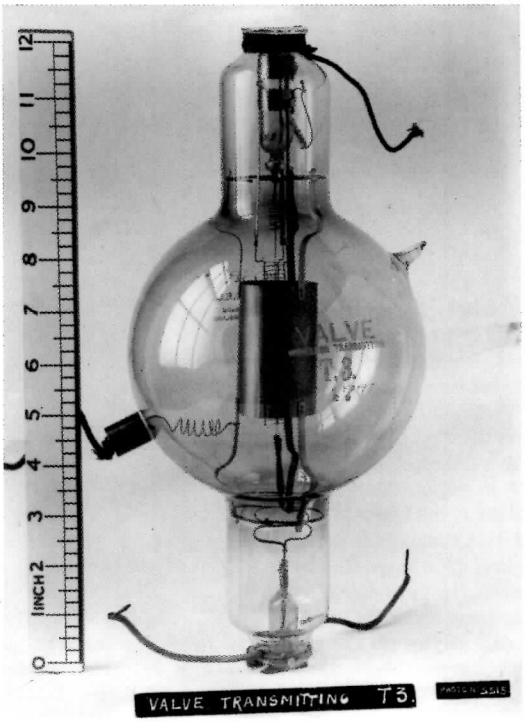
To this point in time, most wireless valves had been powered from batteries. Providing HT potential to operate this new range of high power transmitting valves was not a simple matter; batteries to provide up to 8,000 volts were not really practical. The problem was solved most elegantly by leaving out the grid of the transmitter valve thus producing a rectifier diode of exactly the right sort of rating.

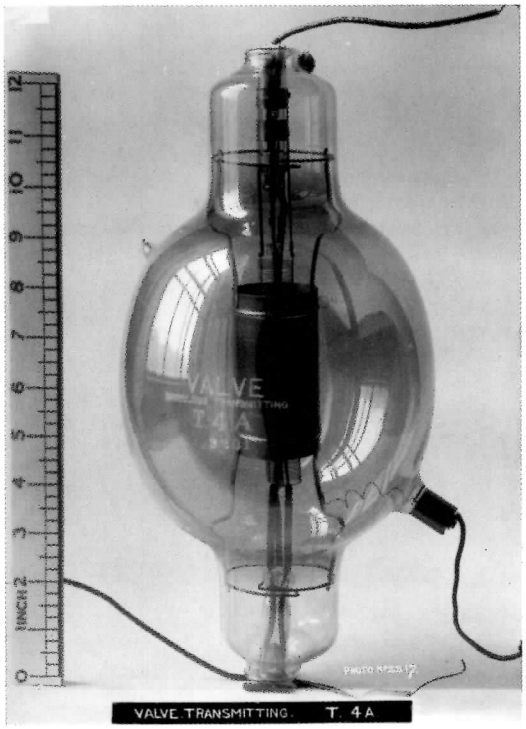
What about the Workers?

There was a human side to the management of the Hammersmith factory which remained part of the culture of the Company throughout most of its existence. Chris Wilson, Factory manager of Osram and, therefore, of the emergent valve activity was a powerful influence in this regard. An example is the treatment of men returning from the trenches of the Great War, many of whom were in desperate mental and physical state and not truly employable. Chris Wilson made sure that as many as possibly were given jobs, many more than could reasonably have been justified. The policy of helping the disabled in this way persisted for many years and we can confirm from our own experience, that it earned enormous respect from those who benefited.

Life in the factory was complex, complicated by social classes and a bewildering range of crafts and skills. The period covered in this article emerges from the Victorian era into the Edwardian, a time of the Great British Empire, the maturing of UK industrial power, the entrepreneur and big mill owners on the one hand, and on the other, millions in service or manual occupation with little security of employment. One should not assume from this that life in M-OV was unhappy. On the whole we believe the contrary to be the case. In a sense people knew their place and respected each other's skills and contributions. Management was generally on a human scale, modern graduates of business schools would probably say incompetent or, at least inefficient. On the other hand, most people could appreciate what they were doing and knew that it was worthwhile.

M-OV (Osram) was known in the area as a good and caring Employer. Right from the beginning, the Company had a subsidised canteen, very important in those days, and a long-established policy on the provision of recreation facilities. A weekly dance originally held on the top floor of the old B-block and later in E5 (the 5th floor of E-block) was fitted out with a quality sprung floor and a specially raised ceiling! The Firm ran sports teams of all sorts and had a large well equipped sports ground. Every year there was a Christmas party for the children of employees and the local needy. The firemen (fire was an ever-present threat in a factory of this type) were provided with a billiards table to help while away the time between incidents. Importantly, labour was much less mobile than would be the case today, generally people remained close to the place they were born. Loyalty was a much stronger motive than it is today. People generally believed that if you were loyal to the Company, the Company would be loyal to you. We suppose this was partially illusory but people did believe it and the result was a much lower turnover of staff than in modern industries. As a result people worked for, and identified with, the Company to a greater degree and everyone knew each other at a





T3 Transmitting valve
Far right: T4A Transmitting valve

Cyril Cosgrove, who took charge of M-OV R&D on Receiving valves.

Clifford Patterson: founding Director of Hirst research centre

personal level better than would be common now. Also, whole families worked at the factory and the sons and daughters of existing staff came into the enterprise. In addition to all else, this created a family atmosphere, more protective, more personal, more loyal - really terribly old-fashioned.

The Birth of M-OV

The Marconi Wireless Telegraph Company of the UK was the dominating influence in wireless in the UK and to an important extent also in the US and around the world. During the Great War, most of the output of valves from Osram was going to Marconi or to service Marconi wireless equipment in the field, both transmitters and receivers. As a result, a second special working relationship was established, this time between the two commercial organisations.

Important new relationships of the type that affect our story were also emerging on the other side of the Atlantic. By 1919, General Electric of the USA was being encouraged by the US Navy to establish a wireless company with the power to challenge the dominance of the Marconi Company of the UK and so secure US military and commercial interests. Accordingly, GE launched a new Company, RCA (Radio

GEC research laboratories, Wembley, 1944

Corporation of America) which absorbed the Marconi Company of America and critical patent rights from a number of other sources. The new Company was greatly strengthened a year later through cross-licensing agreements with Westinghouse and Western Electric, both also of the US. An interesting twist to this story will emerge in a later article.

In parallel, or possibly in response to the consolidations taking place in America, the Marconi Wireless and Telegraph Company of the UK sought to strengthen its position as a world ranking force in wireless by securing a source of valve expertise, the most critical technology, and a valve manufacturing capability. The aim was achieved by forming a new jointly-held Company with Osram which was to build on the already formidable expertise of Osram in this area. The new company was called the Marconi-Osram Valve Company and was incorporated at the Hammersmith site within the Osram factory. An extract from the agreement forming the new Company is set out below,

"An agreement made this twenty sixth day of November one thousand nine hundred and nineteen between the General Electric Company Ltd (hereinafter called "the Electric") of the first part and Marconi's Wireless Telegraph Company Ltd (hereinafter called "Marconi's) of the second part and the Marconi Osram Valve Company Ltd (herinafter called "the Valve Company") of he third part.

Whereas the Valve Company has been registered under the Companies Act 1908 to 1917 as a private Company with a capital of one hundred thousand pounds divided into one hundred thousand shares of one pound each with the object (amongst others) of acquiring from the Electric the business of manufacturing electric valves now carried on by the Electric at its factory at Brook Green Hammersmith in the county of London.

And whereas the Electric and Marconi's are jointly interested in the formation and undertaking of the Valve Company

Now it is hereby agreed as follows:-

The Electric shall sell and the Valve Company shall purchase etc etc .....Lease of the said factory .....Electric and Marconi's agree with the Valve Company not to manufacture Valves .....Electric and Marconi's shall allow to the Valve Company the free use of all patents and patent rights ...."

It was an excellent and most fruitful agreement. Marconi acquired their manufacturing capability and state-of-the-art technology, GEC acquired the considerable patent rights held by Marconi, not least those generated by Round. The new company acquired a powerful customer and design expertise without compromise to its access to the technical and financial support of Osram nor to its freedom to exploit markets wherever it could find them.

One year later, the Company changed its name to the M-O Valve Company or M-OV as it was popularly called.

Following the formation of M-OV, a new temporary building, O-block, was erected and the valve activity transferred there. The business expanded rapidly. O-block was retained for the valve R&D activity for many years under the direction of Cyril Cosgrove, the tall handsome gentleman of whom we shall hear more in later articles whilst manufacturing expanded into the main buildings taking up space vacated by the declining carbon filament business and subsequently, as we shall see, displacing the lamp business altogether.

M-OV works 1919

Nonetheless, there remained throughout most of the life of M-OV, a culture within the Company, and amongst its employees, that required M-OV and its managers to play a subservient role to their counterparts in Osram. Not infrequently, senior, influential personalities within M-OV "graduated" to senior positions within Osram. The equity relationship probably influenced this situation greatly and not necessarily to its best advantage.

At the time of writing, Marconi is a well-known name associated with the GEC of the UK. In 1919, however, Marconi had no formal links, other than a normal trading relationship, with the GEC, the owners of Osram. As we shall see, it would be forty years before M-OV would lose its status of joint ownership and a further ten years before Marconi and GEC would tie the knot via the take-over of Marconi by English Electric which was itself swallowed by GEC in 1970.

Strategic Decision - Hirst Research

As we have seen, metal filament lamp technology emerged from Germany and there is evidence that the technological centre of excellence remained within the German side of the Osram Organisation right up to the start of WW1, indeed into the early months of the war. With the change of ownership, the Directors of GEC, Hugo Hirst in particular, decided that the interests of the Osram Company could best be served by direct control of its own technical developments. Accordingly, they embarked upon the revolutionary idea of establishing an Industrial Research Laboratory. As early as 1916, Clifford Paterson of the National Physical Laboratory had been recruited to head the new Organisation but the appointment had to be put on hold for the duration of the war. Immediately hostilities ceased, Paterson was installed and by 1919 the new Research Laboratories had been opened in modest premises on the Hammersmith site. It was the courageous, far-sighted step that marks Hugo Hirst out as a man of vision.

By 1923, HRC was to be re-housed in a magnificent, purpose-built facility on a green field site at Wembley, just a few miles away to the north of London, see photographs. By this time, the Laboratories, named the Hirst Research Centre (HRC) were required to provide scientific support for all the businesses of GEC, not just the valves and lamps from which it had sprung. Over the years, this superb establishment was to prove its worth in many areas, not least in the development of high power transmitting valves for broadcast and the design of high power pulsed devices for radar.

1919 had been a momentous year for the Hammersmith site with the formation of M-OV and the founding of the Research Laboratories. By 1920, Brook Green Works, Hammersmith, had become a very important centre of excellence, encompassing the large, powerful and profitable lamp factory and the rapidly growing and extremely influential valve factory, M-O V, at the cutting edge of technology in the vastly important new areas of wireless and related valve electronics. There, to underpin this position and to ensure the continued pre-eminence of the organisation in these new area of science, were the Research Laboratories.

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The Second Hand Book Review by Robert Chesters

Plastics and Industrial Design by John Gloag Publisher George Allen and Unwin. 1946

John Gloag is reasonably well known for both his books on furniture design and his membership of the Modern Architectural Research group (MARS) the British wing of CIAM, the international society of modernist designers and architects which boasted Walter Gropius, Le Corbusier and Wells Coates, among others, as members.

If you're mad keen on this type of thing then rush out and find a copy (mine is not for sale) if not read on. This book is as far as I know, a long time out of print, but continued visits to second-hand book dealers should prove ultimately fruitful.

Being essentially about plastics, obviously this book will not suit every radio enthusiast. On the other hand, if you are well rounded and interested in what thoughts were nipping about in the good old days then this is well worth a perusal.

There is a very interesting reference to the AD65 and the UAW 78 EKCOs, citing them as good examples of industrial design. Obviously, these radios have not only just been recognised as such. Amongst a range of plates one will find an illustration of a Fada "Bullet" showing the knobs, handle and bezel in their original white. Also the designer of the Pilot "Little Maestro" cabinet is named, but you'll have to find the book to see who it was.

The book is divided up into two sections, the first by Gloag about industrial design and the second about plastics by Grace Lovat Fraser. Both sections display a strong enthusiasm for and quite realistic belief in the subject. On the other hand, if I were to criticise their approach then I would say that they are perhaps a little too eager to look beyond the shortcomings of the material. In fact there is virtually no criticism made of plastics of any kind, not even a note that some plastics have stability problems. I learned a great deal from reading this book and found a plastic that I had never even heard of before - phenol furfural. Wow! It sounds deadly.

In my view an interesting and relevant book. Well worth searching out and hoarding.

'A Radio Amateur and a Handful of Wichety' Grubs by David Read continued from page 6

however, it suffered a broken mainspring but it was messed about by several so called watchmakers. My son eventually lost it. I hope you succeed in getting it going, and I hope it will serve you well."

It has indeed served me well and is keeping the correct time as I write. Unfortunately I have not received any extraordinary offers for it, but perhaps like Bob I would be nervous about taking two wives in exchange; that would, after all, make three. As for Wichety grubs as a delicacy, that is a cultural difference too far. A goat might be nice though!

Bibliography: The Wireless World, issues covering 1913 to 1924.

World at their fingertips by John Claricoats, published by the RSGB in 1967.

Anybody ever thinking that the North Americans rarely built any quality sets should perhaps spare a thought for the two illustrious companies of Scott and McMurdo Silver, both of Chicago, Illinios; who produced some of the world's best sounding (and in some cases visually stunning) wirelesses ever manufactured.

Perhaps owing more to the fact that there was never a valve tax in the United States, these two companies manufactured sets that used far larger numbers of 'tubes' than would be found in any equivalent British set.

The next few pages will reveal a breed of wireless whose like will never be seen again. Not for the faint hearted collector.

Great Scotts!

and McMurdo Silvers (not forgetting the occasional Midwest)

The John Howes collection and archive. Photography by Carl Glover.

fig 1 McMurdo Silver 15/17 in 'Georic Cabinet', 1937. Original cost 78 Guineas

fig. 2 Mc Murdo 'Masterpiece V' in Clifton cabinet, 1936

fig. 3 McMurdo Silver in person

fig. 4 The mcMurdo Silver laborotory in downtown Chicago. It was reckoned that if one could get faultless reception in this area then one could get it anywhere.

fig 5 The impressive range of cabinets available for the 'Masterpiece' chassis

fig 6 Scott 'Imperial Grande' cabinet

fig 7 'McMurdo Times', featuring front cover signed by America's valve pioneer: Lee De Forest; inscribed 'to McMurdo Silver, outstanding radio engineer with regards and best wishes, Lee De Forest.'

fig 1

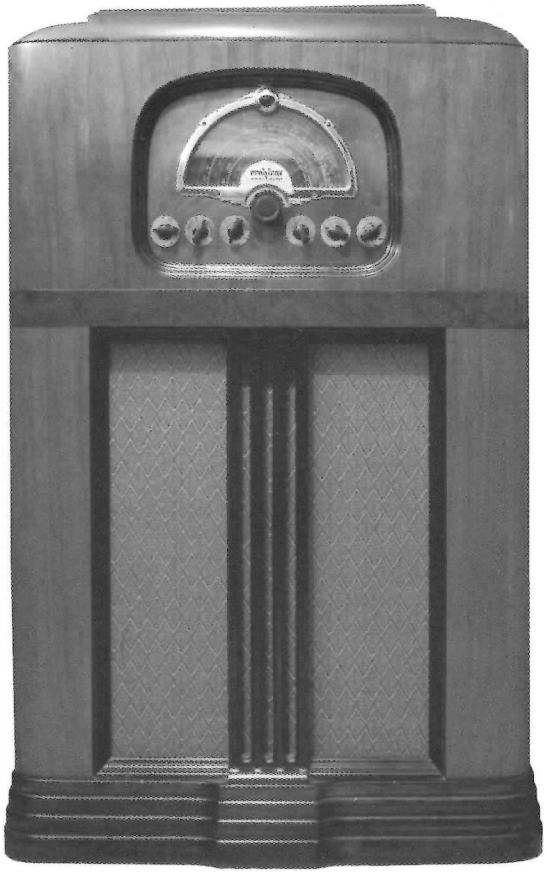

fig 2

fig 3

fig 4

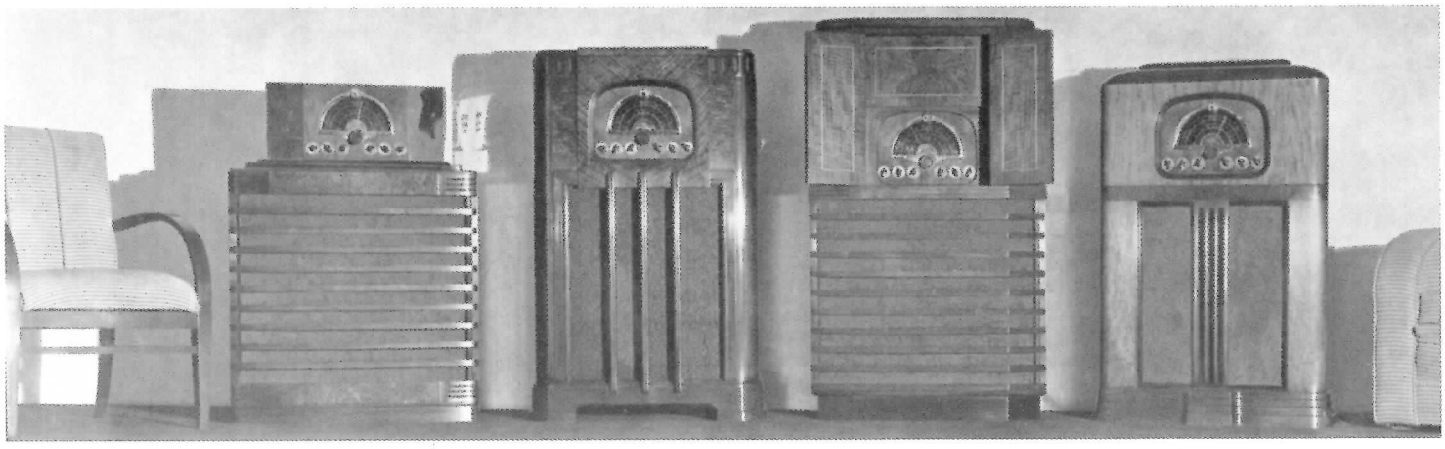

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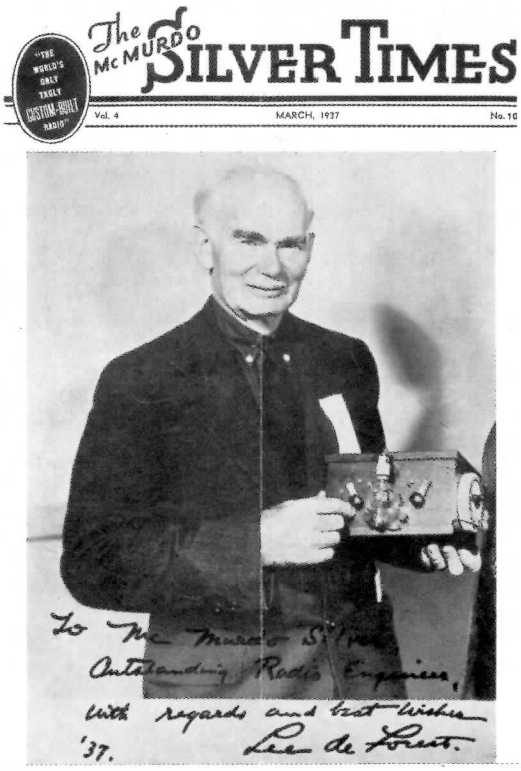
fig 6



The McMURDO SILVER TIMES

"THE WORLD'S ONLY TRULY CUSTOM-BUILT RADIO"

Vol. 4 MARCH, 1937 No. 10

To Mr. Murdo Silver,
Outstanding Radio Engineer,
with regards and best wishes
'37. Lee de Forest.

fig 7

fig 8

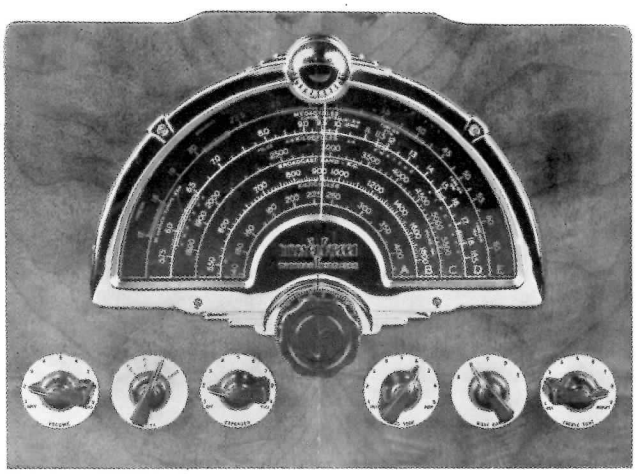


fig 9

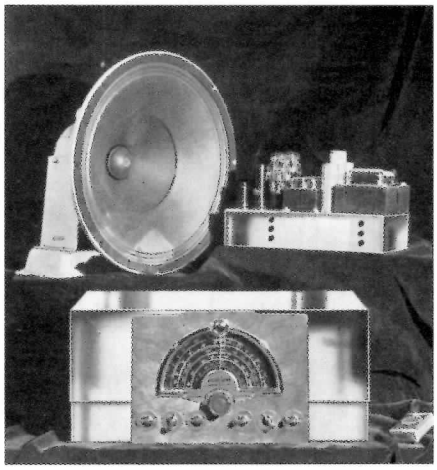


fig 10

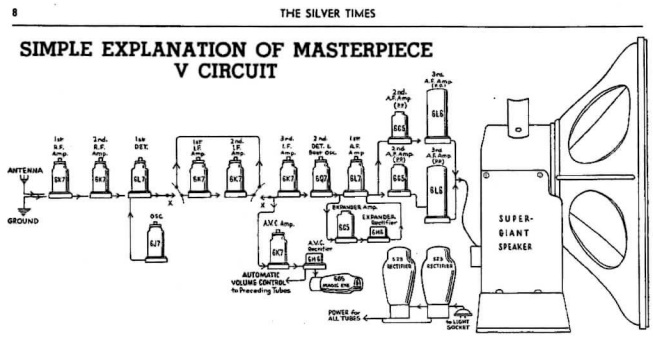


fig 11

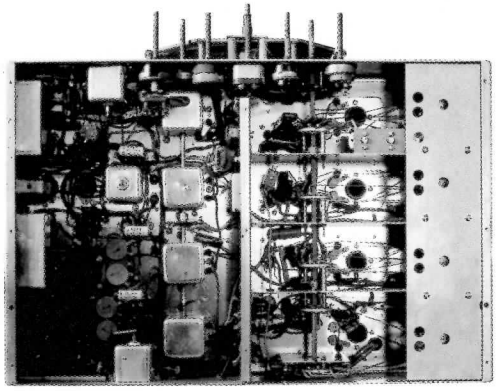


fig 12

fig 8 An advertisement for the McMurdo Masterpiece V offering a free Clifton Cabinet with every purchase

fig 9 The dial of the McMurdo Silver 'Masterpiece'

fig 10 The super giant 18" speaker (weighing 68 pounds), amplifier and receiver unit comprising the 20 valve McMurdo Silver 'Masterpiece V'

fig 11 A diagram illustrating how the valves are utilised in the McMurdo Silver 'Masterpiece V'

Fig 12 Photograph of underside of tuner section of a Scott A.M 'Philharmonic' 30 valve set, 1937

fig 13 Photograph of McMurdo Silver 'Masterpiece V' on a Clifton cabinet

fig 14 The 'Ice-pick test'; where an ice-pick is used instead of an aerial in a McMurdo Silver wireless and then it is tested to see how many countries it can pull in

fig 15 Some ornate cabinets for the 'Masterpiece'

fig 16 Scott A.M Philharmonic in 'Warrington' cabinet

fig 17 Scott 'Sixteen' in Acousticraft cabinet, 1937

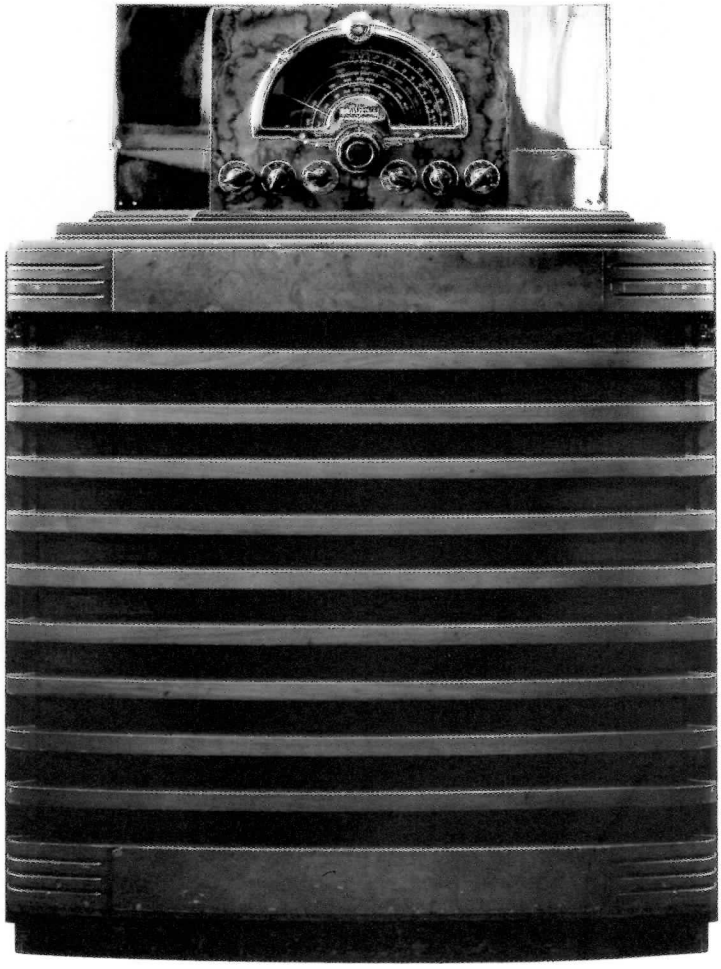
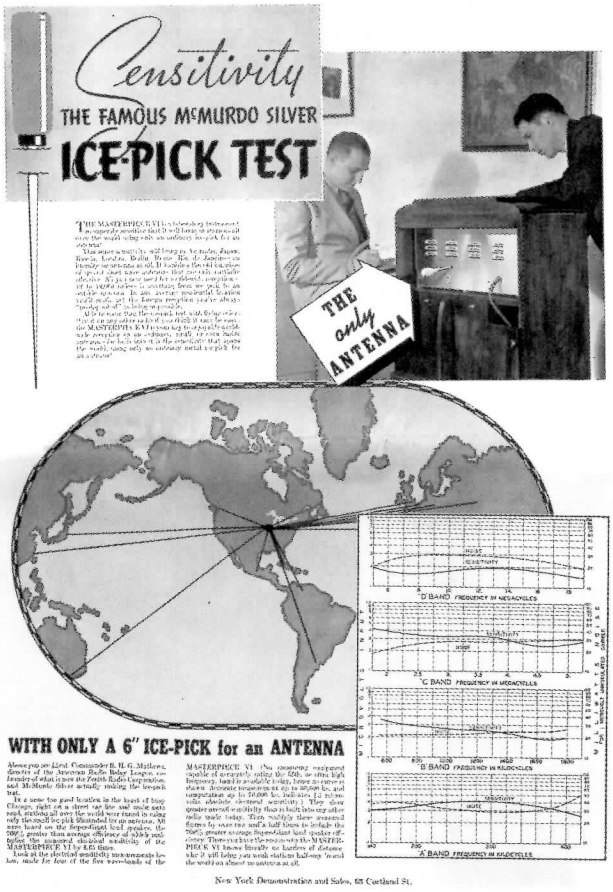


fig 13

fig 14



CABINETS FOR THE MASTERPIECE

For those who are interested in really fine cabinets for the Masterpiece, six different styles are available, and a combination for phonograph and radio installation in the same cabinet.

These Masterpiece cabinets should not be compared to or confused with the radio cabinets found on competitive radio sets such as are turned out by the thousands. Each Masterpiece cabinet is designed by men who are authorities on period furniture, then hand built and finished by master craftsmen who have devoted their lives to the building of fine furniture, and whose work a hundred years from today will be as much sought after and highly valued as is today the work of the famous furniture designers and builders of a century ago. Each and every Masterpiece cabinet has been specially co-related and matched to the receiver itself to provide the finest possible acoustic reproduction, a point usually completely overlooked in quantity production radios.

Only small illustrations appear herewith, but to those who are interested a booklet illustrating these cabinets in their full beauty is available for the asking at no cost.

fig 15

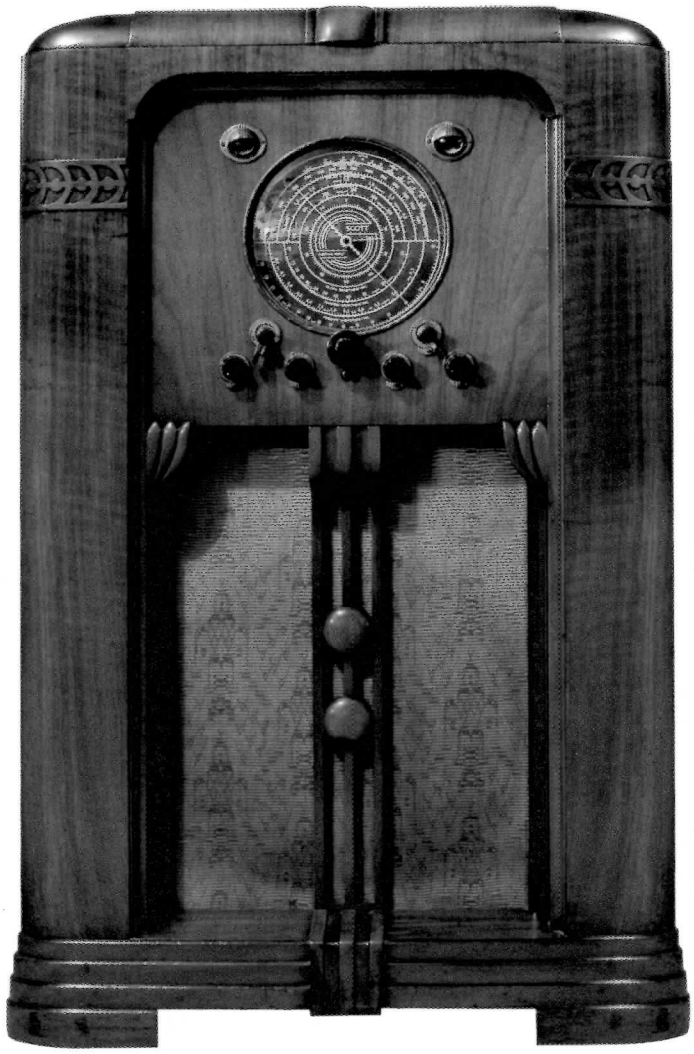


fig 16

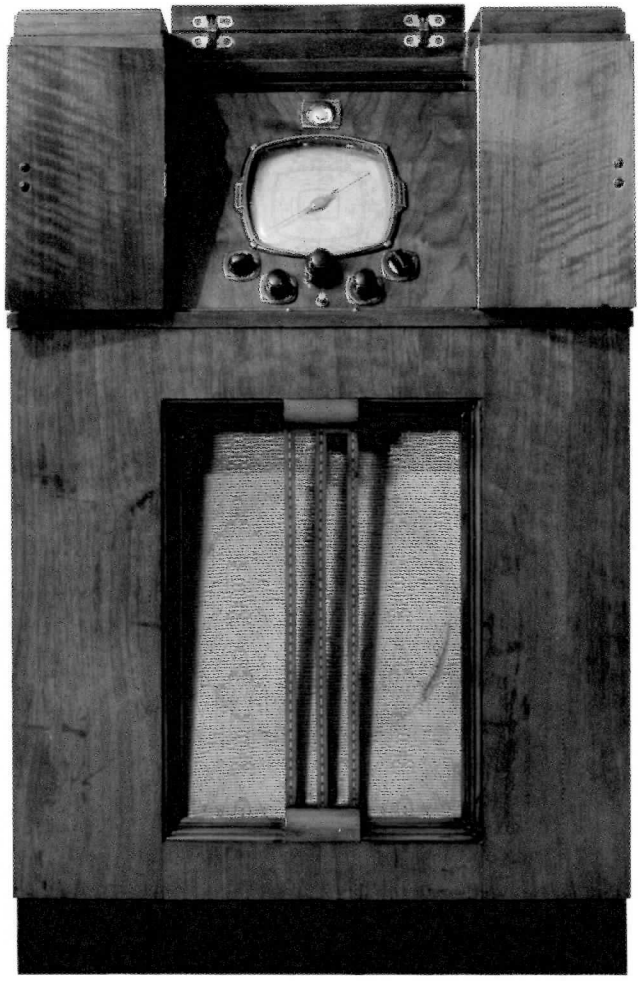


fig 17

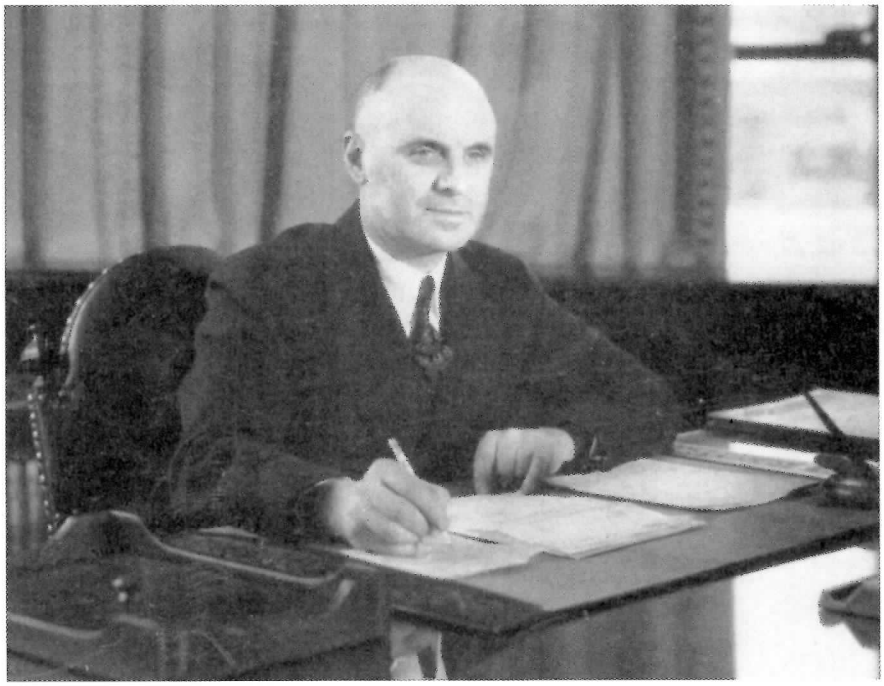


fig 18

fig 19

fig 18 E.H. Scott

fig 19 Cover of Scott brochure of 1932

fig 20 Scott 'Allwave 23' in 'Waverley Grande' cabinet, 1936 (late model - 7 knobs)

fig 21 Scott Allwave 15 in in Tasman cabinet, 1934

fig 22 Scott 'Sixteen' chassis

fig 22a Scott 'Sixteen' chassis minus covers

fig 23 The 'Scott-Tauscher sound unit'; working on the theory that the f-shaped holes in the body of a violin or cello offer a better quality of sound, this device was screwed over the speaker opening of a Scott wireless cabinet, apparently offering a better reproduction of classical music.

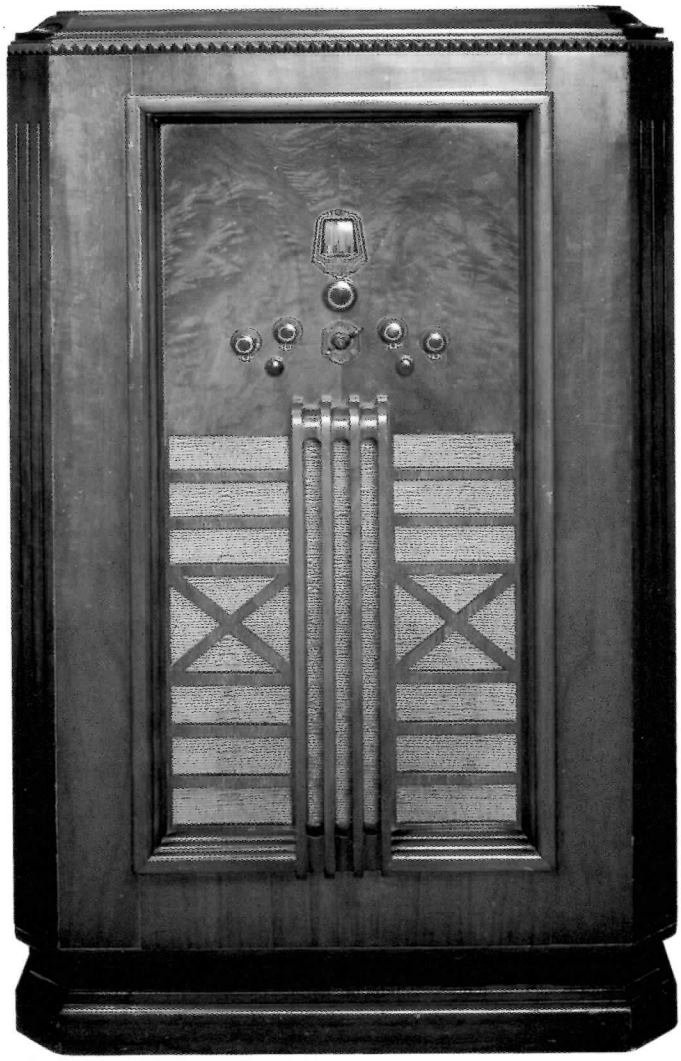


fig 20

fig 21

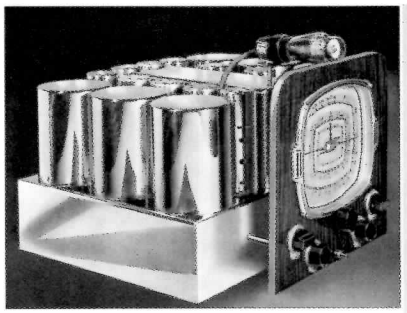


fig 22

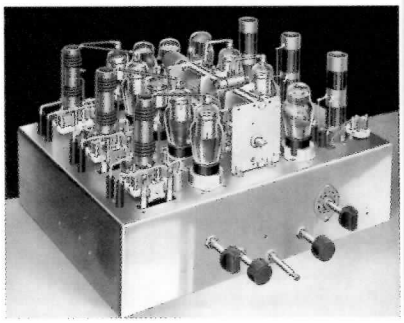


fig 22 a

NEW IMPROVED

Scott-Tauscher Sound Unit

AMAZES MUSIC LOVERS

NOW AVAILABLE FOR ALL MAKES OF RADIO RECEIVERS

When the Tauscher Sound Board Unit was introduced last Fall it created a sensation among music lovers. For the first time they heard tones of instruments and voices coming from broadcasts received over the air and from their favorite recordings with a more natural quality than they had ever heard before. The new Scott-Tauscher Sound Board Unit (fully protected by Tauscher Patents and Scott Patents Pending) is the result of extensive research that has been carried on in our acoustical laboratories to duplicate in your own home with even greater efficiency, *the same conditions under which you listen to music or voice in the concert hall or studio.*

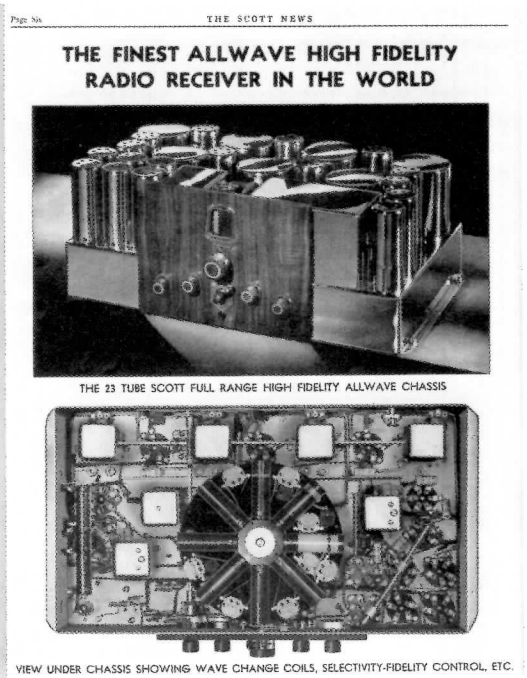
Sound Boards in Violins and Pianos

The original conception of this revolutionary method of sound distribution was made by Mr. Arno Tauscher, a skilled old world craftsman who has been making fine violins for over 40 years, and who started his experiments in sound boards for radio speakers over twelve years ago. It is well known that the tone of the stringed instruments such as the violin or piano do not come to your ears from the strings themselves, but from the surface or forte holes of the sound chambers of these instruments.

If you were to remove the sound board from the piano or the sound chamber from the violin and listen to the sounds of the strings of the violin without the sound chamber, or to the sound of the strings in the piano as the hammer hits them with the piano sound board removed, you would immediately notice a tremendous difference in carrying power. The sound chamber of the violin and the sound board of the piano amplify the tones of these instruments, giving them "carrying" power, spreading them evenly all over the concert hall or room.

When a loudspeaker is equipped with a new Scott-Tauscher Sound Board Unit

(12)



Page Six THE SCOTT NEWS

THE FINEST ALLWAVE HIGH FIDELITY RADIO RECEIVER IN THE WORLD

THE 23 TUBE SCOTT FULL RANGE HIGH FIDELITY ALLWAVE CHASSIS

VIEW UNDER CHASSIS SHOWING WAVE CHANGE COILS, SELECTIVITY-FIDELITY CONTROL, ETC.

fig 23

fig 24

fig 24 Advertisement announcing the latest 23 valve Scott as 'The Finest Allwave High Fidelity Radio Reciever in the World' also illustrating an impressive ayout of components on underside of chassis

fig 25 Scott 'Allwave 23' in 'Westminster' cabinet (early version) 1935. The 'Allwave 23' comprised of; Tuner: 1x6D6 RF amplifier, 1x6A7 1st detector, 3x39/44, 1x6D6, 4xIF stages, 1x76 2nd detector, 1x1st AF 6C6, 2x2nd AF drivers, 1x6B7 AVC amplifier, 1x76 noise suppressor, 2x neon voltage regulators, 1x76 Oscillator, 1x76 beat oscillator, 1x76 tuning meter driver. 'Allwave 23' amplifier: 1x83V rectifier, 1x5Z3 rectifier, 4x2A3 output triodes parallel push-pull 35 Watt output. Weight of tuner: 46Lbs, weight of amplifier: 30Lbs.

fig 26 Midwest 'Royale', 24 valve receiver, 1935; their most ambitious set, with six triode connected 6F6's in parallel push-pull-in output stage

fig 25

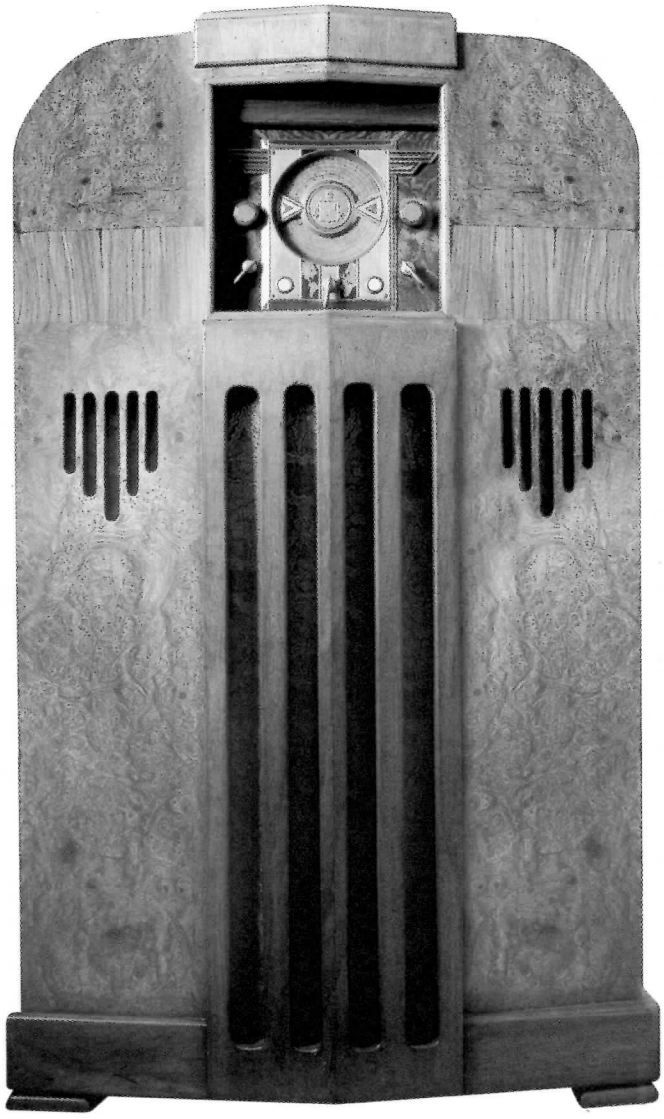
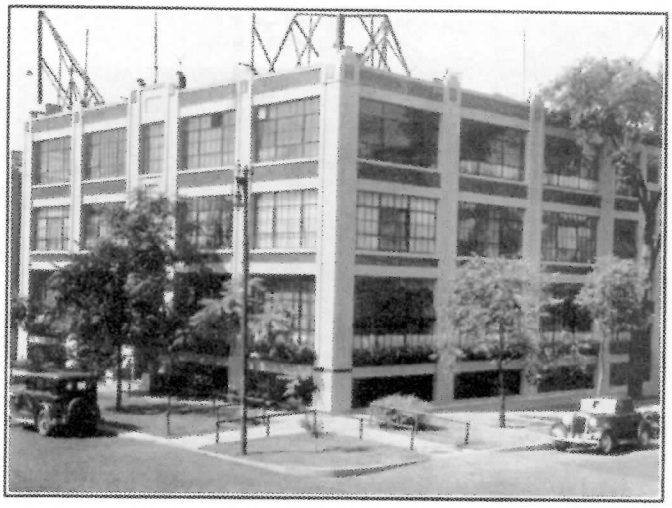


fig 26

fig 27



SCOTT RECEIVERS are designed, built and tested in this modern Laboratory. On the top floor, left side, is located Research and Experimental Laboratory—on right side Construction and Test Departments—the second floor houses the General Offices and Demonstration Studios—on the first floor is located the Foreign Department.

fig 28

fig 27 The Scott laboratory; situated in more salubrious surroundings than those of McMurdo Silver.

fig 28 Some of the cabinets available for the Scott chassis of your choice

Fig 29 Front view of Scott 'Allwave 23' in 'Wellington' cabinet

fig 30 Rear view of 'Wellington' cabinet showing mains-energised 12" loudspeaker with two mains energised tweeters. Amplifier uses two rectifiers and 4 x 2A3 output stages

fig 31 Some more unusual cabinets that could house a Scott receiver

fig 32 the impressive Scott 'Philharmonic'; the flagship of the Scott range, only superceded by the 1935 'Quaranta' which could purchased as a 40, 48 or 50 valve version. These incorporated very elaborate audio amplifiers with 4 or 5 speakers in a separate cabinet. The price started from 2,500 US Dollars! The fifty valve version had three cabinets, one housing a disc-cutter. An example of the 'Quaranta' has been discovered in the USA.

fig 33 Scott 'Allwave 15' on reproduction 'Napier' cabinet

figs 34 and 35 Punters enjoying their Scott purchases

figs 36, 37 and 38 the only known Scott 'Quaranta' and its speaker

fig 29

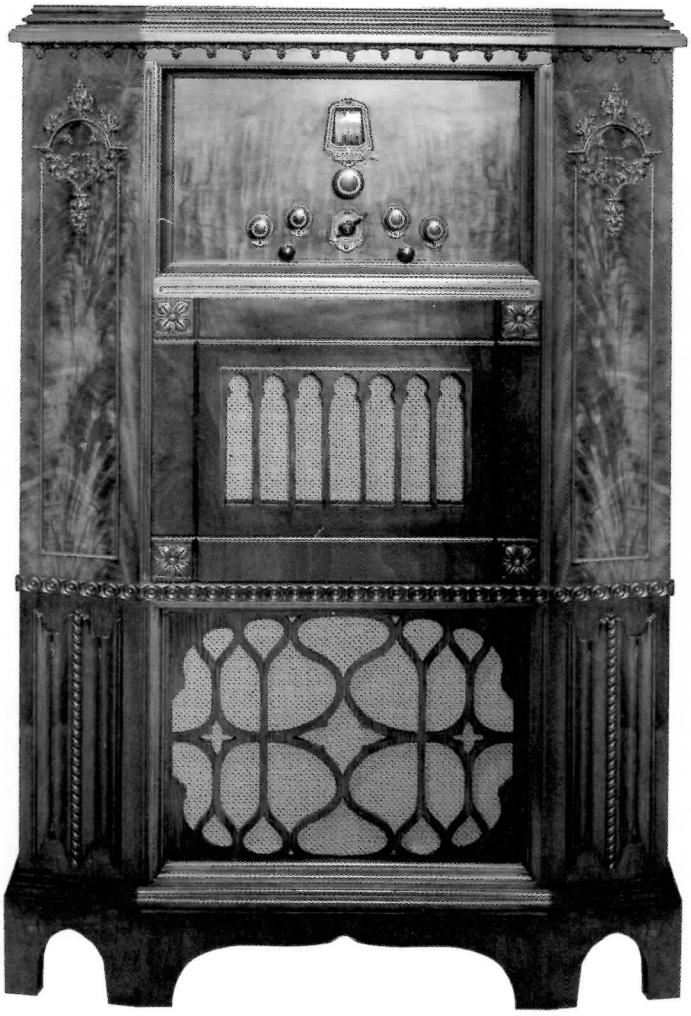


fig 30

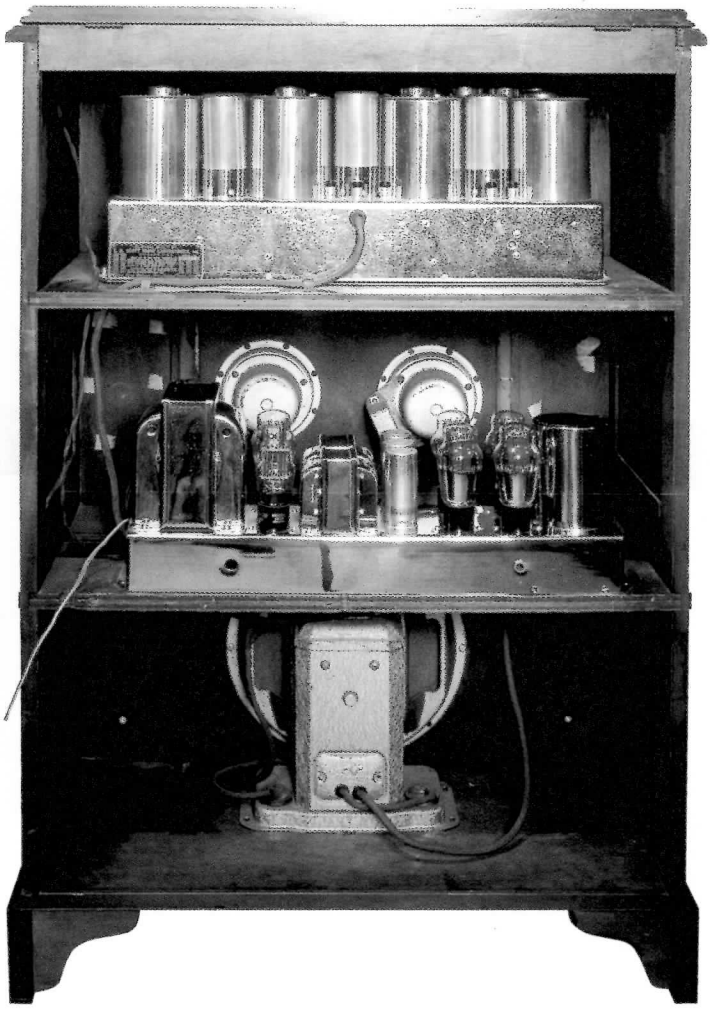


fig 31

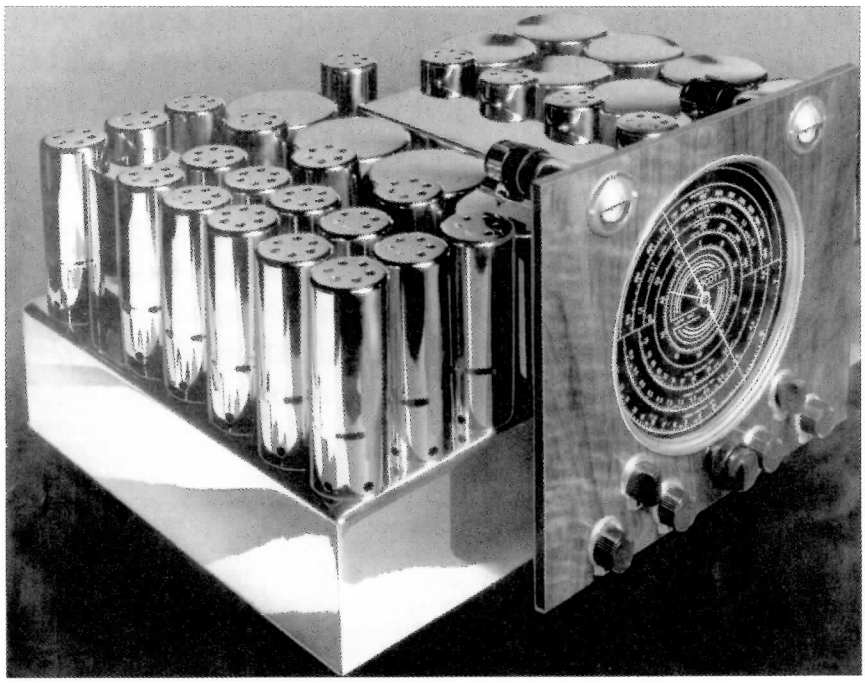


fig 32

fig 34

fig 35

fig 36

fig 33

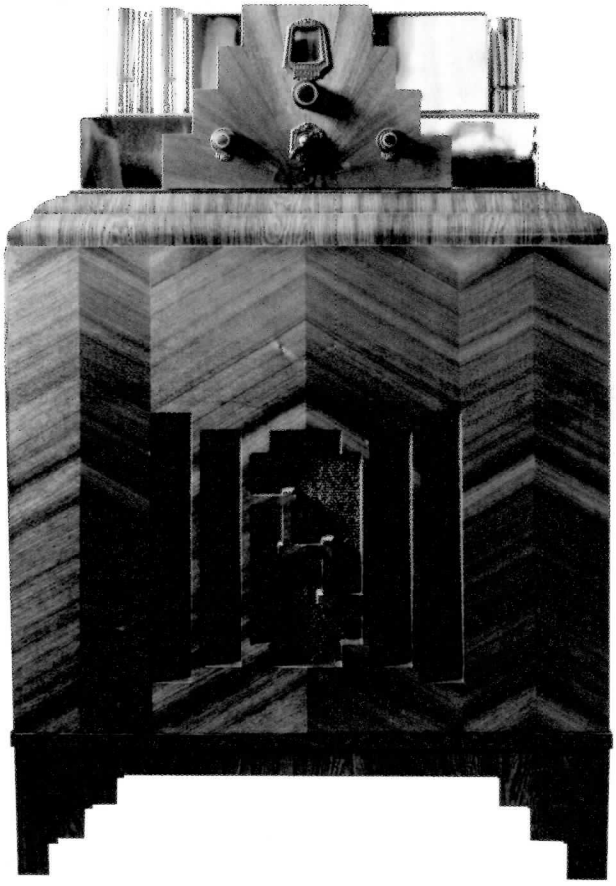
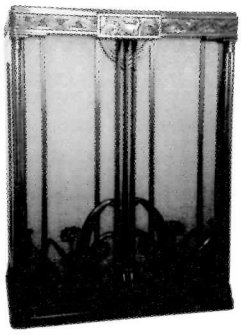


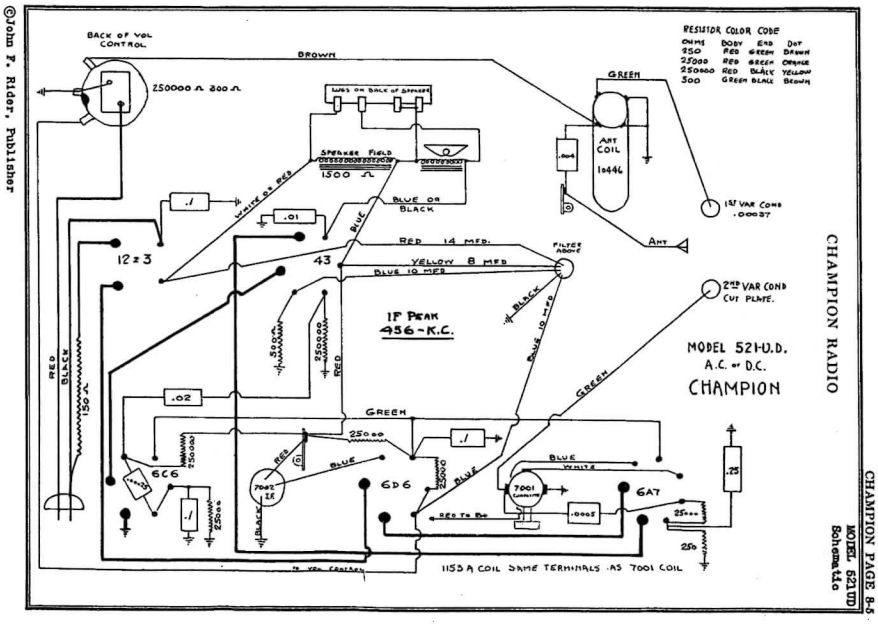
fig 37

fig 38



Anyone who reads American radio magazines will have come across references to the Rider Manuals, and may have wondered, as I did, what they were. I have over the years acquired a set of the first ten or so, and thought others might like to know what the fuss is all about.

In the States the selling and repair of radios were separate businesses, and the repair shop was a common sight, unlike in this country, where the seller did the repairs. I wonder who did the repairs under guarantee? Presumably each radio dealer had an arrangement with the local repair shop. Anyway, this created a demand for easily accessible service information, and this was filled by either the Rider books or others, like Sams Photofacts.



On First Looking into Rider's Manuals

by Geoffrey Dixon-Nuttall

'I have always held that Americans can't really draw circuit diagrams in an easily understood form. This is very obvious in Rider, as some of the circuits, particularly from small firms, are drawn in a great hurry, apparently by the tea lady using the wrong end of the pen.'

The Rider manuals are a model of how it should be done. Arranged alphabetically by makers they cover almost any manufacturer one can imagine, from the aristocratic Stromberg-Carlson to the slightly comic Gamble-Skogmo, and although the quality of the drawing is uneven (see later) it is usually easy to see what is supposed to happen.

Although some of the makers are very obscure there is only one mention of McMurdo Silver. The only circuit quoted was by permission of "Short Wave News", so he must have refused to play.

The official title of the Rider series is "The Perpetual Trouble Shooter's Manual"; whether the "Perpetual" refers to the Manual or the Trouble Shooter I have never decided. It is not even clear what if anything this title means, except that a new volume appeared each year, so that it would never get out of date.

Each volume is about an inch smaller than A4, and held together by a very strong loose leaf system. It needs to be, as Vol.1 is about three inches thick, and they got bigger with the years. Each book has about seven or eight hundred pages, I would guess, but I'm not going to count.

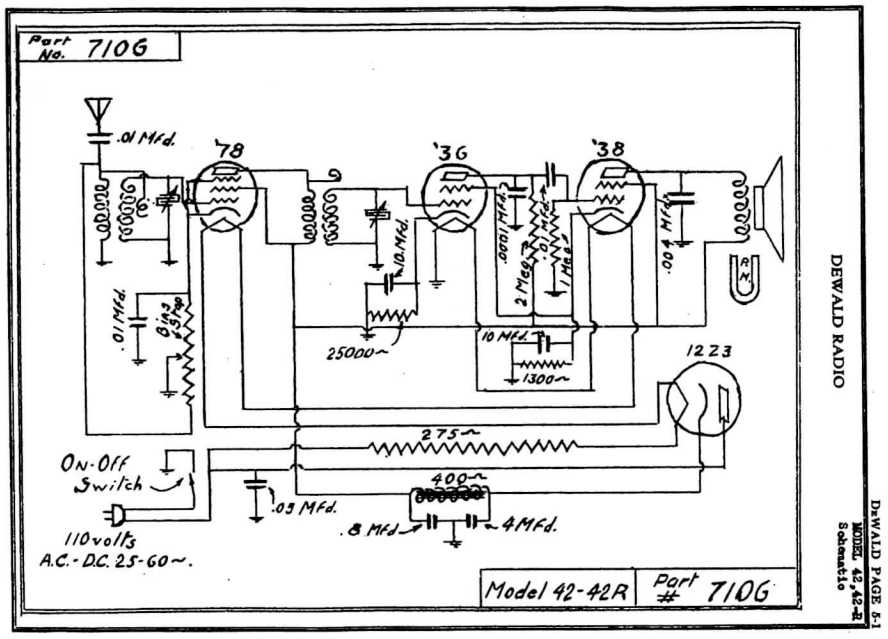
Vol.1 appeared in 1931, dealing with 1930 sets, and in theory each volume deals with one year. Unfortunately some firms were very lax in sending in the information, and even in vol.4 some of the sets are obviously from the late twenties. Each page contains at least a circuit and a sketch of the chassis showing the location of the tubes, but some go on with complex alignment data for pages. Most of the circuits are on one page, but the more elaborate are folded over. What is lacking is a description of how the thing actually works, and our own dear Trader sheets score in this respect. Some of the automatic tuning systems are particularly baffling.

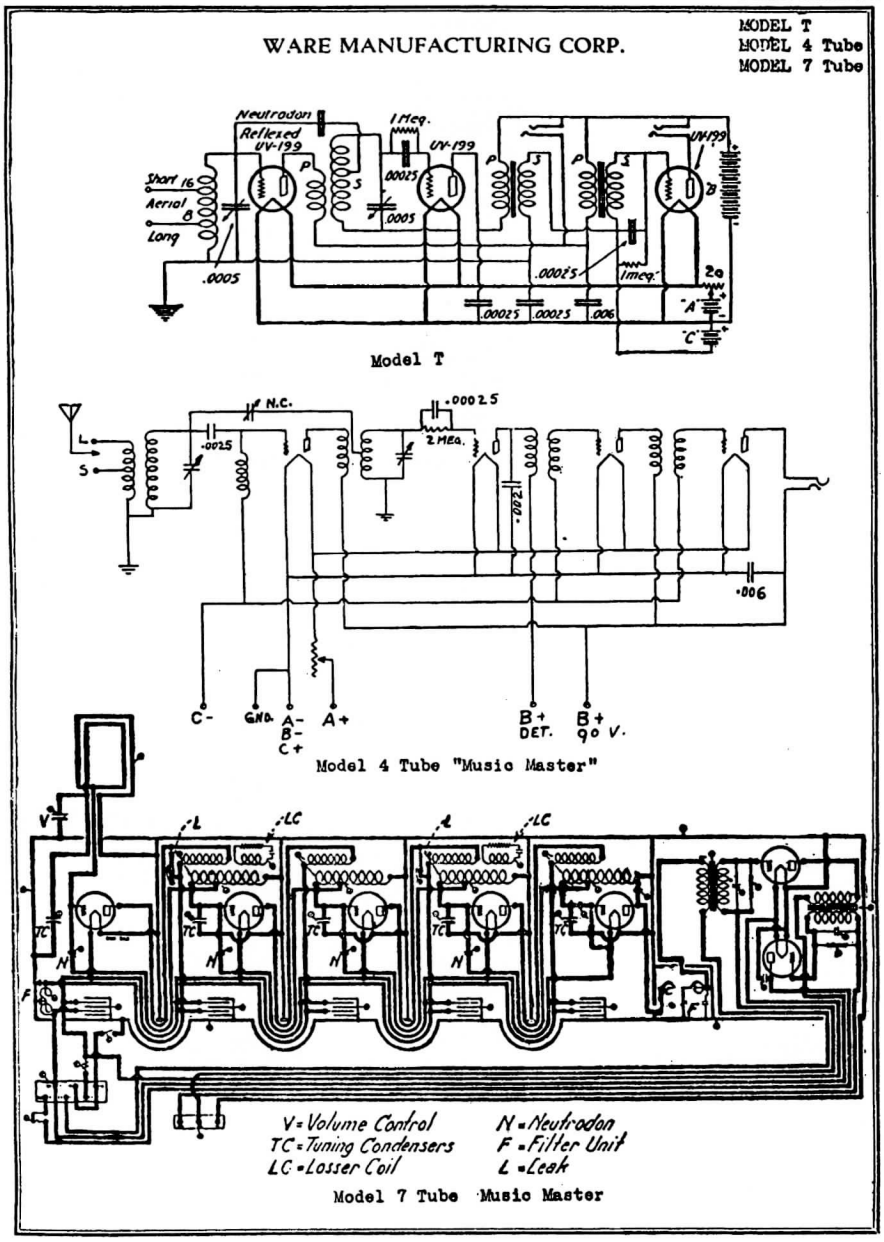
I have always held that Americans can't really draw circuit diagrams in an easily understood form. This is very obvious in Rider, as some of the circuits, particularly from small firms, are drawn in a great hurry, apparently by the tea lady using the wrong end of the pen. I wish, also, that they wouldn't leave off the envelope round the valves, as this makes the circuit even more difficult to follow. Also some of the diagrams have been shrunk to a ridiculous extent, and a few of them are about two inches square

Looking through these books one gets a feeling of deja vu, as some of the sets were actually the same, under different names; a lot of taking in each other's washing went on, when the factory ran out of space. The big mail order firms, Sears Roebuck and Montgomery Ward put their own brand on sets which were made for them, under the names of Silvertone and Airline respectively, and some of the sets have three different names.

These volumes provide an enormous data base for anybody interested in the development of the broadcast receiver, from the early three-tuners to the standard superhet. After about 1936 the circuits are in fact very monotonous, and a lot of them could be replaced by ditto signs, as identical four-valve superhets were churned out by the thousand. It is the oddities that provide interest, and in some cases, astonishment!

A lot of variety, for example, is found in the American attempts to produce a cheap and simple superhet. In Europe we had the double-diode pentode output valve, with a nice high slope, so no audio stage was necessary to produce a very useful three-valve superhet. This type never appeared in the States, for some reason. There were one or two rare types, but





they never caught on. They did, however, have a very useful valve in the form of the 6F7, which is a triode-pentode with completely independent sections. As well as its obvious use as a frequency changer, this could provide IF and audio amplification, but what about the detector? One solution was to use the triode as an anode bend detector, but then there was no AVC output. An ingenious idea was to connect the triode as a leaky grid detector, and get the AVC from the grid leak.

More scope for originality was found in the various tries at an even simpler superhet, with no IF stage and the frequency changer feeding directly to the detector. Normally this provides quite a reasonable performance if a little reaction is provided, but in most cases none was used. I can't see how they got this to be acceptable.

A startling characteristic of the larger sets is the quite unnecessary use of valves. A pair of triodes (or even three) were used instead of a double diode triode, and separate oscillators were quite often used for no apparent advantage. Multiple output stages were another feature, with four output valves used in parallel push-pull. I have heard that some American sets had valves that were fitted but not connected. This is a rumour, as far as I have been able to find out, but not that exaggerated.

Not only radios were covered by Rider, as test gear, amplified pianos, cinema sound amplifiers, and even the Theremin turned up, as well as some frighteningly elaborate record changers. There were also lots of that species unknown in this country, the farm radio. Some of these ran off home-generated 32 volt supplies, with this as the HT. The number of car radios is an eye-opener, too.

Let's look at some of the strange things that were actually put into production.

Vol.1

In 1931 there were few superhets, but it was amazing what variety could be found in early TRF sets. Two cases of a 5-gang tuning capacitor, for example, and a Philco with AVC (three years ahead of Philips!). If the drawing can be believed, the Sparton type 49 had two tuned circuits followed by six untuned triode RF stages. Direct coupling was tried (hoorah for Bonavia Hunt), and Echophone, for one, used the Dynatron oscillator. The RCA Radiola 82 had remote control of tuning and volume; it even made records

Vol.2

A few more superhets appear, and even a portable (RCA P-3 1). The first of the monster output stages; the Fada 81 had six 71As in parallel push-pull. To my surprise the first set I can find with negative feedback was made by Crosley, who I always think of as cheap and cheerful. This does not seem to have been repeated, by them or anybody else.

Vol.3

The arrival of the 3-valve short superhets. The first I can find is an oddity, again by Crosley, where they used the output valve as the detector! A more normal one is the RCA R-27, in which the second valve is a pentode used as anode bend detector, but with no reaction. The R-28 was the same set with an RF stage added. Fada had a double superhet for short waves (rather ahead of Murphy!) and Grebe used a six-gang tuner. Oh yes, and the first of the Pye-type torch bulb tuning indicators (Columbia).

My volume 3 has several pages repeated, which makes me realise that collating this thing must have been a nightmare.

Vol.4

By now the four-valve superhet was the norm but one or two oddities surfaced. The Wunderlich detector came and went. Unusually Emerson made a reflex. (These are almost unknown in the US due to the low cost of valves.) General Electric for some reason best known to themselves made a Grandfather Clock radio, with remote motor control of tuning and volume. One of these turned up at Harpenden; to my disappointment it was very ugly. The speaker is at the top, facing up!

Another strange thing was the Lincoln 33, with no RF stage but four if amplifiers.

Vol 5 provides less of interest. By now radios were nearly all either four-valve superhets or three valve

continued on page 39

The McMichael model 382 was introduced for the 1938/39 season at the Radio Show, better known to us all as "Radiolympia". It is a 9-valve motor-tuned set, with some unusual features that will become apparent later. Looking at the contemporary adverts it can be seen that it was a high quality set which was aimed at the better off listener; the initial price of 18½ guineas being twice that of the average radio, and half as much again as the better-quality five valve sets in existence at the time. By comparison, the motor-tuned Ekco PB189 was priced at just 12½ guineas and on paper was a similar set, but lacked the "magic-eye" of the McMichael and arguably, some of the sophistication. The set continued into the next model year and in 1940 the price was reduced to 15 guineas.

Resurrection and other lost causes

Restoring the McMichael 382

by Mike Izycky

The 382 is essentially a straightforward, 4+1 superheterodyne (AC/TH1, AC/VP2, HL41DD, AC/5Pen, UU5), with three waveband coverage. The circuitry is however complicated by the addition of the Automatic Tuning Correction circuitry, which adds another three valves to the set, viz. side chain IF amplifier (AC/VP2), Foster-Seeley discriminator (V914, a lot easier to line up than a Round-Travis) and a reactance valve (AC/SP1). A word of warning: if you're already thinking "I'd like a motor tuning set", DON'T even think about getting one without ATC. The resetting accuracy of the average motor drive mechanism is simply not good enough to do without it. I expect now that I'll be assailed by the owners of Ekco PB510s and 515s who will tell me that the improved Ekco mechanism really did do away with the need for ATC. In line with its quality pretensions, the 382 has side-chain AVC to avoid distortion arising from common feeds to the detector and AVC diodes, and a complex negative feedback and variable selectivity tone control network, giving a choice of "Fidelity" (bass and top boost), "Normal" (no correction at all), "Bass" (bass boost and top cut- this really makes the set thump!) and "Foreign" (top cut only). The set has a very smooth sound, no doubt due to the considerable negative feedback (The maths gives the output stage a voltage gain of just 12dB). Certainly, it's very free from the usual distortions you hear. This is delivered by a 10" Rola energised loudspeaker. It also has a magic eye (ME41), operated in a very shoddy manner which detracts from the set's overall quality: when automatic tuning is selected, the magic eye is blanked by disconnecting the cathode from near ground and pulling it to HT via a 60kΩ resistor. McMichael must have had a touching faith in the heater-cathode insulation of the ME41...

It didn't however, always look the cared-for radio you see in the photographs. The pictures of the set in its unrestored state gives you some idea of the challenge that awaited. What, though, is so special about these large (and sometimes unattractive) motor-tuned sets? I think a little background is called for...

I started collecting old radios in 1981, having been

Below: The cabinet 'before'
Right: McMichael's models for 1940
Above: Front of McMichael brochure for 1940
Left: The McMichael 382 fully restored

given a huge export Murphy (a TA160) by my old Physics master at school- and from that day on I was hooked. In fact, to this day I can't believe that I got it home by balancing it on my bike's crossbar! However, I needed a magic eye for the Murphy and I was at a loss at what to do- after all, nobody sold these locally- until I spotted in a copy of "Television" an advertisement for the Vintage Wireless Company, and its new catalogue. I promptly sent off my postal order and waited. When it arrived, tucked inside the newly acquired catalogue was a copy of issue 82 of the "Vintage Wireless Newsheet", and in it was a set that left me so in awe of the genius of the designers of pre-war radio that I was well and truly addicted. It was a Murphy A40C, and I just had to have one. Along with all these other wonders of (then) over forty years ago.

I think it was Chas Miller's book "The Practical Handbook of Valve Radio Repair" that first brought to my attention the concept of motor tuning, or was it a colleague's copy of "Radio Engineering" by Roy C. Norris? Well, that was it. I had to have one of these motor-tuned sets. I kept looking in Tudor's Newsheet, but at the time a pound a week pocket money was not going to buy me much, even if one appeared. Time passed, I left school and went in to a job as a Technical Assistant with the BBC in 1984. It was here where I finally managed to find out about the BVWS, and was recommended for membership by of all people, the Senior Engineer in the studio next door! That Senior Engineer was Brian Forster, and he encouraged my interest further and taught me many useful tricks and tips. If you have read Jonathan Hill's "History of the BVWS", you will recall that Brian was one of the founder members of the Television Section.

All this didn't alter the fact that I was still no nearer acquiring a motor-tuned radio. I don't think I saw many even in those first Harpenden meetings I attended around 1985 (although I do recall an HMV 659 console) - or if I did, under Brian's advice I left well alone. This changed with my first visit to Gerry Wells' museum. I remember asking Gerry if he had any motor-tuned Ekcos for sale. He said that he hadn't, but he did have

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McMICHAEL 382 MOTOR-TUNED NINE

CIRCUIT.—The input, on medium and long waves, is through a band-pass circuit and, on short waves, through a coupling coil to a single tuned circuit.

V1, the frequency changer, is a triode hexode. The oscillator circuit is on conventional lines with separate heterodyne voltage control resistors for each waveband. The hexode portion receives A.V.C. through the usual decoupling network and the anode circuit contains the primary of the first intermediate frequency transformer. There are alternative primary windings controlled by a switch so that the band acceptance can be increased in the high fidelity position.

V2, the I.F. amplifier, is a variable-mu pentode. This feeds the second I.F. transformer which, again, is a special type fitted with an auxiliary winding (this will be referred to later). The normal secondary goes to the signal diode of V3, a double diode triode.

The rectified potentials across the diode load are taken through a coupling condenser to the volume control which works on the triode portion of the valve. The volume control has a special tapping for feedback purposes (see below).

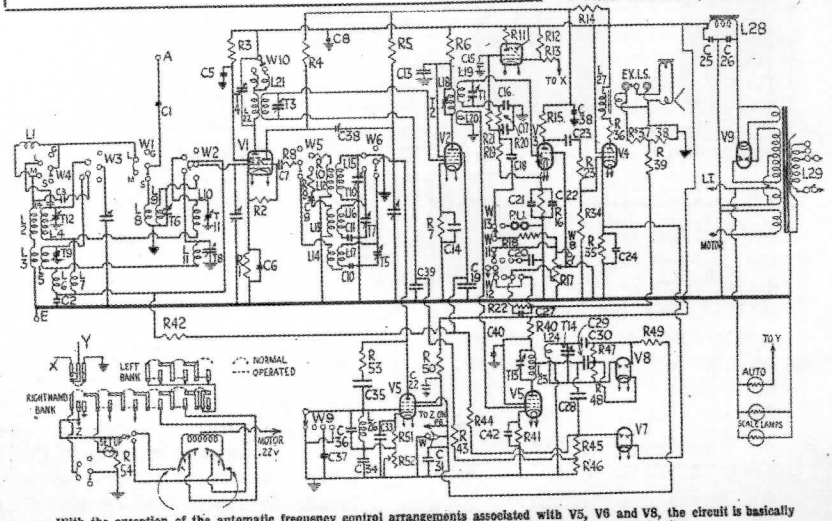
Audio frequency amplification is carried out by the triode portion of V3, which is resistance coupled to V4, an output pentode. The secondary winding of the output transformer is connected to a resistance network and voltages produced across part of this are introduced through a filter to the tapping on the volume control of the triode valve in such a way that negative feedback is obtained.

The power supply is obtained through a mains transformer, full-wave rectifier,

Motor tuning, with automatic frequency control, is employed in the eight-valve, plus rectifier, three-band model 382 by McMichael.

CONDENSERS

C.	Purpose.	Mfds.	C.	Purpose.	Mfds.
1	Series aerial	.0002	20	Tone filter	.001
2	V1 A.V.C. decoupling ..	.1	21	V3 cathode by-pass ..	.01
3	M.W. top aerial coupling ..	.000007	22	V3 cathode bias shunt ..	50
4	L.W. aerial coupling ..	.000012	23	L.F. coupling	.01
5	V1 screen decoupling ..	.1	24	V4 cathode bias shunt ..	100
6	V1 cathode bias shunt ..	.1	25	H.T. smoothing	25
7	V1 osc. grid	.0001	26	H.T. smoothing	8
8	H.T. line shunt	.01	27	Feedback filter	.06
9	M.W. osc. grid	.0001	28	A.V.C. coupling	.00005
10	S.W. fixed padder	.0035	29	V8 cathode coupling ..	.00005
11	M.W. fixed padder	.000532	30	V8 diode coupling	.001
12	L.W. fixed padder	.000168	31	V5 suppressor decoupling ..	.1
13	V2 anode decoupling ..	.1	32	V5 screen decoupling ..	.1
14	V2 cathode bias shunt ..	.1	33	V5 cathode bias shunt ..	.1
15	T.I. fixed shunt	.1	34	V5 bias shunt	.1
16	H.F. filter	.0001	35	V5 grid phasing	.002
17	H.F. filter	.0001	36	V5 grid input tune	.000015
18	L.F. coupling	.005	37	V5 grid input M.W. ..	.00005
19	V2 suppressor grid decoupling	.1	38	H.T. sub-line decouple ..	8
			39	V2 A.V.C. decouple. ..	.1



With the exception of the automatic frequency control arrangements associated with V5, V6 and V8, the circuit is basically orthodox. Motor-drive circuits (bottom left-hand corner) are separate from radio circuits.

V9, and a smoothing choke in the form of a speaker field together with the usual electrolytic condensers.

Four further valves are also employed in this receiver. First of all there is V7, a double diode, one diode of which is employed for A.V.C., the cathode being returned to the cathode of the output valve and the A.V.C. voltages being taken through the usual decoupling networks.

The auxiliary winding of the second I.F. transformer is taken to the grid circuit of V6 which, in conjunction with V8, a double diode, forms an automatic frequency control discriminatory network.

The anode circuit of V6 contains a special transformer with the primary tuned to the intermediate frequency and a split secondary tuned as explained in the alignment notes. The diode and its associated network are connected to a control valve, V5, and at the precise intermediate frequency no rectified voltage is obtained.

If, however, the frequency varies, which may occur if the oscillator drifts or the automatic tuning introduces a mechanical tuning error, a rectified voltage will be produced across this network. The voltage may be either positive or negative with respect to the earth line. description of this principle app the *Service Engineer*, November page v.

V5 is the control valve. The or negative voltage produced a network of V8 is applied to the s grid of V5 through a simple d network. The grid circuit of t contains an inductance-capacity tion and there is also a phasing between the grid and the anod poneuts are so adjusted that the tends to act as an inductance whole arrangement is in parallel tuned oscillator circuit of the tr tion of V1.

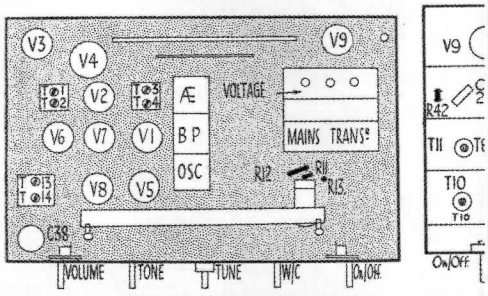
Should the oscillator frequen the V6-V8 combination produces voltage which alters the effectiv ance of the V5 circuit, which, brings back the effective oscillat ance so that the correct frequency tained.

Finally, there is a convention motor circuit, with the usual radial contacts and a lamp and for setting the station selector the desired point.

(*Continued on page 23*)

RESISTANCES

R.	Purpose.	Ohms.	R.	Purpose.	O
1	V1 cathode bias	250	34	V4 grid bias	50
2	V1 osc. grid leak	50,000	35	V3 cathode bias	
3	V1 screen decoupling ..	40,000	36	V4 anode stabilising ..	
4	V1 osc. anode load	40,000	37	Speaker transformer pot. (part)	
5	V2 anode load	17,000	38	Speaker transformer pot. (part)	
6	V2 anode decoupling ..	2,000			
7	V2 cathode bias	200			
8	Regeneration modifier ..	100	39	Feed back input	
9	M.W. het. voltage control ..	1,000	40	V6 anode decoupling ..	
10	L.W. het. voltage control ..	1,000	41	V6 cathode bias	
11	Tuning indicator feed ..	1 meg.	42	V1 A.V.C. decoupling ..	10
12	Tuning indicator cathode pot. (part).	60,000	43	V3 A.V.C. decoupling ..	50
			44	V2 suppressor grid decoupling	50
13	Tuning indicator cathode pot. (part).	500	45	A.V.C. diode load (part) ..	1
14	H.T. line decoupling ..	5,000	46	A.V.C. diode load (part) ..	12
15	V3 anode load	50,000	47	1st discriminator diode load	1
16	V3 cathode bias	1,000	48	2nd discriminator diode load	1
17	Volume control	500,000	49	Control bias decoupling ..	1
18	H.F. stopper	500,000	50	V5 screen decoupling ..	
19	V3 demodulating diode load	200,000	51	V5 cathode bias fixed ..	
20	H.F. filter	50,000	52	V5 cathode bias variable ..	
21	T.I. grid decoupling ..	1 meg.	53	V5 phasing resistance ..	10
22	Feedback filter	200,000	54	Setting lamp resistance ..	
23	V4 grid filter.	500,000			



Top (left) and underside chassis layouts. Detail diagrams of the com (lettered A to F above) are given, under correspo

'One of the things that I have learned over the years of collecting is to look beyond the abuse, the neglect, the scratches and chips in the finish and even the downright bodgery to the set beneath; a bit like people, really- and judge whether or not I really have a pearl amongst swine.'

this motor-tuned McMichael. "McMichael," I thought, "Hmmm. Different". Armed with the little piece of paper with the crudely drawn sketch upon it that Gerry used to catalogue the serried ranks of radio-filled black bin-bags in his loft, I ventured upstairs. The set that I acquired was originally part of the McMichael company's collection, and I was informed that it had been used to provide parts for another set. This was the model 802, which was a floor-standing model with doors that covered the front of the set when it wasn't in use. I suppose that it was felt that my example was "too far gone" to be worth restoring. The 802 can still be seen at the Vintage Wireless Museum, and I worked on that set first to give me an idea of what to expect when I came to restore my own.

I must admit that at the time I had my doubts. Gerry had given me this set because he felt it would be going to a good home; I wondered if waiting until a good example of the more ubiquitous Ekco PB 189 came along would have been a wiser course of action. Wisdom, however, often gets overruled by the heart and this unusual (I'd never seen one before) and decrepit set won my heart. I just had to nurse it back to life. It came home with me a few weeks later and was placed in a cupboard in my (then) newly acquired house, ready to work on "some day". After all, there were a lot of parts I needed to obtain first before I could even contemplate starting on the set.

At the time of photographing the "before" pictures, the loudspeaker had been removed to allow the field coil to be rewound. It was open circuit, and additionally the output transformer was missing. The cabinet though, is pretty much as found; minus backs and knobs and one of the decorative mouldings next to the loudspeaker. Only the difficult-to-obtain dual concentric tuning knobs had survived, luckily for me. Admittedly, I'd had a go at scraping the finish off to see what was underneath. Not that much though. If you think that this is bad, worse was in store when the set was turned around to examine the chassis...

I'd never seen anything so poor in my life.

It had been robbed of the mechanical parts for the motor tuning, and the whole chassis had thoughtfully (he said, through gritted teeth) been given a coat of black paint to arrest the rampant corrosion. It was also missing some of the buttons for the press-button switches, and the switch mechanism itself had been bodged badly. Painted, too. There was no protective dial glass either: unusually, it's fixed to the chassis on this set. The selector disc was, well, unsalvageable, and just for good measure the chassis had also been robbed of all its valves. Yet all of this didn't put me off. Gerry kindly provided me with nearly a full set of valves- the only one he couldn't supply was the ME41 magic eye, but Langrex supplied that later.

One of the things that I have learned over the years of collecting is to look beyond the abuse, the neglect, the scratches and chips in the finish and even the downright bodgery to the set beneath; a bit like people, really- and judge whether or not I really have a pearl amongst swine. Believe it or not, this set was a case in point. In the chassis' favour were that all the major

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McMichael 382 on Test

MODEL 382.—For A.C. mains, 200-250 volts, 50-100 cycles. Price, 18½ gns.

DESCRIPTION. — Eight-valve, plus rectifier, manual and motor tuned three-waveband superhet.

FEATURES.—Full-vision scale calibrated in names and wavelengths, with inset tuning indicator. Wave-range and fidelity indicators operated by controls. Twelve push-buttons, controls for tuning, master switching, volume, range and fidelity, as well as motor assisted manual tuning, sockets for aerial and earth and pick-up.

LOADING.—30 watts.

Sensitivity and Selectivity

SHORT WAVES (18.5-50 metres).—Excellent short wave gain and adequate selectivity, with easy handling and no drift and a well-maintained gain.

MEDIUM WAVES (200-550 metres).—Excellent gain and selectivity, with local station spread on adjacent channels only and a clean background.

LONG WAVES (350-2,000 metres).—Adequate gain and selectivity. All main stations easily received and very little interference on Deutschlandsender.

Acoustic Output

The pentode fitted gives ample volume for quite a large room without any distortion. In the high fidelity position the quality is very pleasing, with good, clean, crisp attack and good high frequency radiation. The bass is not over pronounced, the general balance on orchestral music being well proportioned. There is very little colouration on speech.

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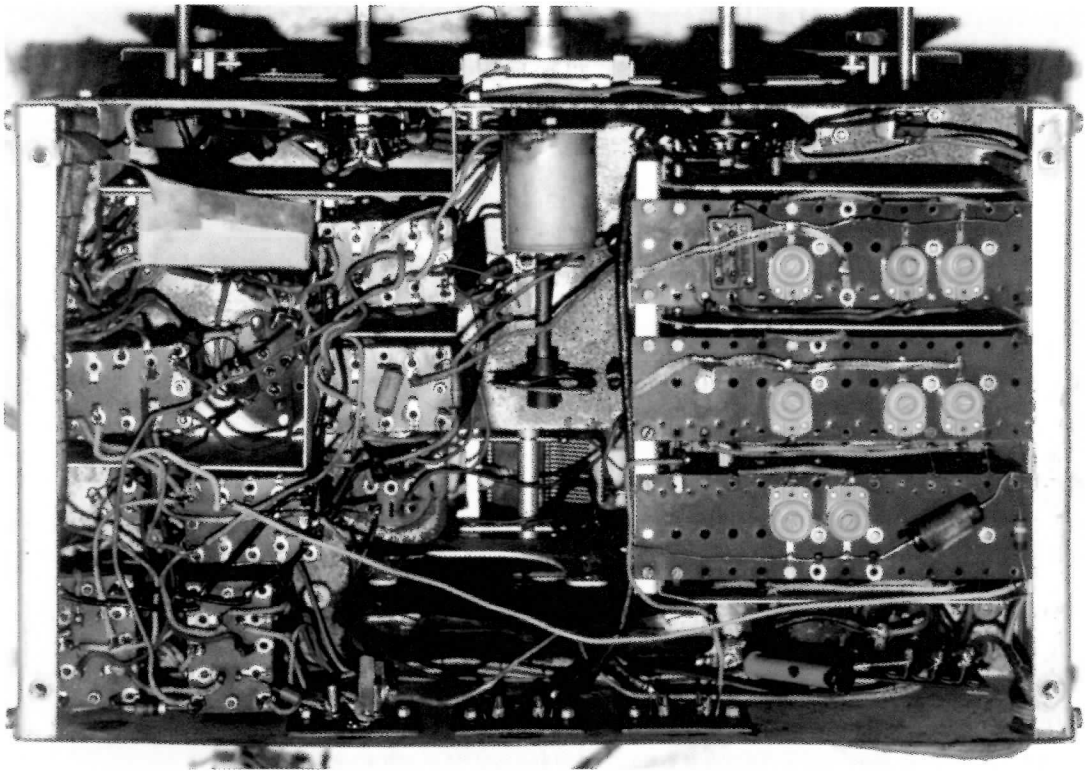
Top right: Underneath the chassis, showing the unitary construction



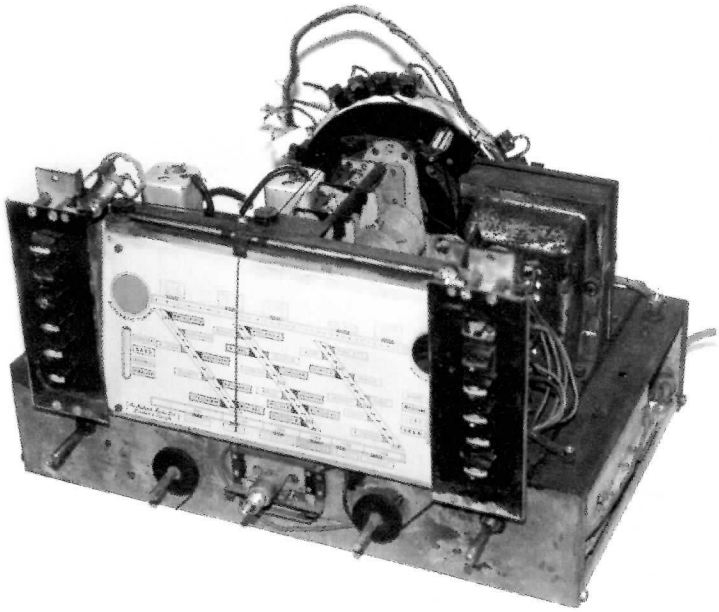
components were there and that few repairs had actually been carried out in the set's lifetime, before it was cannibalised: the faulty components were left in place. Ideal for a rebuilder such as myself...

Over the years (this was a VERY long-term project) parts to replace the missing items were obtained; a motor for the tuning mechanism here, a selector disc there. A stroke of luck came in the shape of another 382 which was acquired for parts; sadly it was a set that couldn't be resurrected for one reason or another- I forget why now. That became a donor of parts for both my own and someone else's 382. Most importantly, I obtained a set of correct knobs and a better upper back from it. Eventually enough items were obtained to start the reassembly. I think it only took about six or seven years! However, some items can very rarely be found in good condition, and these were the contact fingers that select the stations on the motor selector mechanism. These had to be improvised.

Restoring The Chassis

First of all, I needed a map. The only circuit I could find was in the "Broadcaster" service sheets, and this didn't inspire confidence at all. If you have access to it, look carefully at it: spot the short circuit between H.T. and chassis, via the discriminator transformer! I advertised for help and David Cochrane came to my rescue by supplying me with a copy of the original factory blueprint. This, although lacking things like line-up instructions, at least was devoid of howlers like the aforementioned short. I then decided to deal with the chassis. It was simply too unpleasant to look at, let alone work on as it was, and I had errantly decided that this set was to be the subject of the book that's supposed to be in everyone. Yes, silly me, I had a grand plan about writing a book about it! So it was going to be a total, "ground-up" restoration, and firstly components needed to be removed from the chassis. Unusually, the set uses a "unit" method of construction in which a pair of tag panels are bolted to the valveholders via long lengths of brass studding. All the coupling and decoupling components are attached to these panels, which then present wiring tags at their lower end ready to take the interconnecting wiring. Very simple stages like the AVC diode are wired in a more conventional manner, but there are six distinct assemblies under the set. This method of construction meant that by undoing what felt like ten thousand nuts and washers, and disconnecting just the above-chassis components like the mains transformer, all the wiring, valve holders and associated components came away wired together, which greatly simplified matters. Even the wavechange coil assembly came away as one unit which, given the complication of the average coil assembly, let alone one with the extra wiring associated with ATC, was a real blessing. It goes without saying that copious notes were made of what few disconnections there were to assist the eventual reassembly. The disassembled wiring was packed away carefully in a large, flat box and the above chassis components packed with them. With the chassis now bare of all components, it was then sandblasted, along with the mains transformer shrouds to remove all the corrosion and the paint, and then afterwards replated with a bright zinc finish- the original cadmium now virtually unobtainable from most platers on safety grounds. The transformer shrouds were painted in silver Smoothrite.

Some smaller, less corroded parts like scale uprights and the bracing bars that ran from front to back on the chassis were cleaned by hand using successive grades of wet and dry paper, lubricated with WD40. This not only kept the dust down (cadmium is very injurious to your health) but helped protect the metal against further



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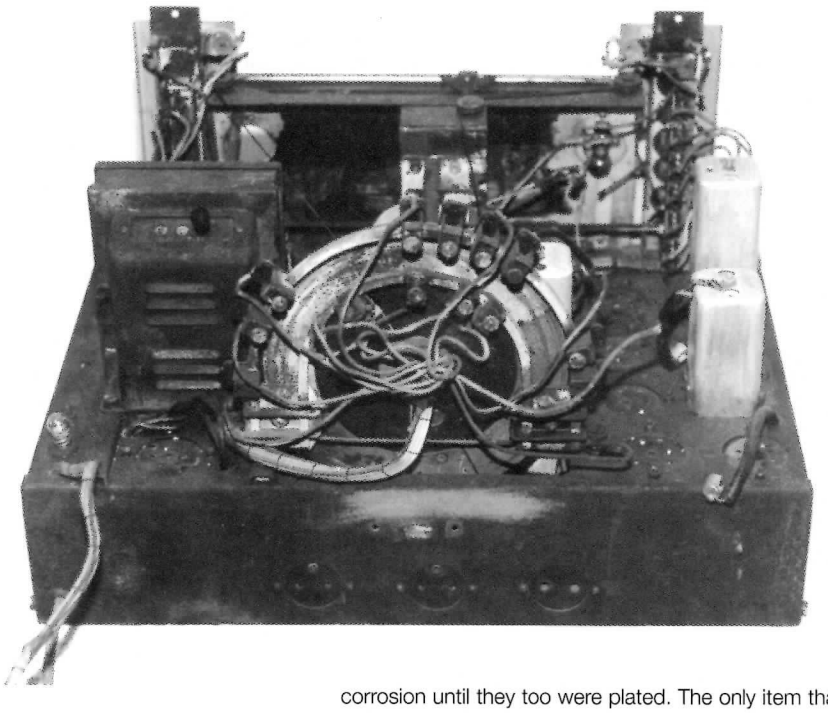
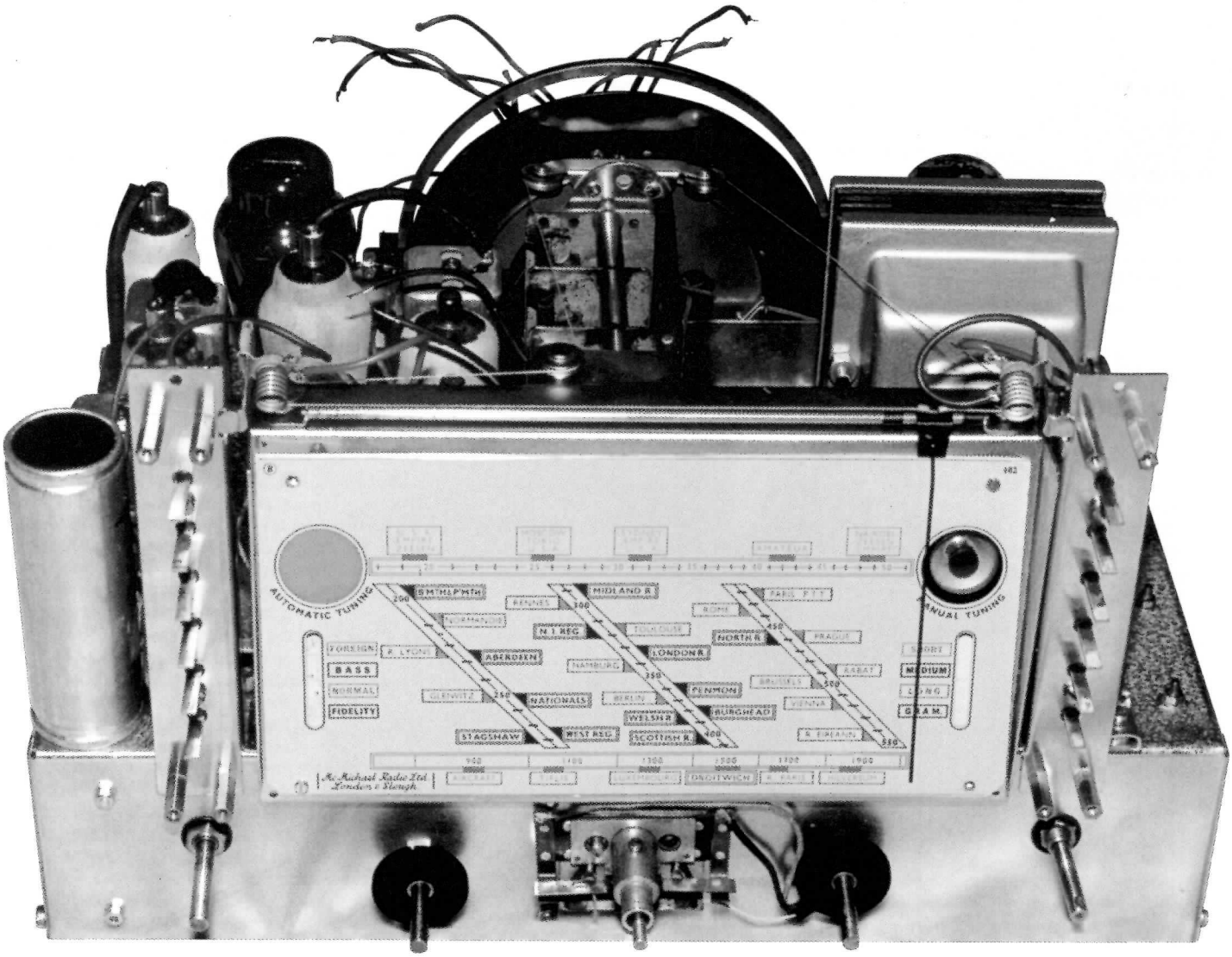


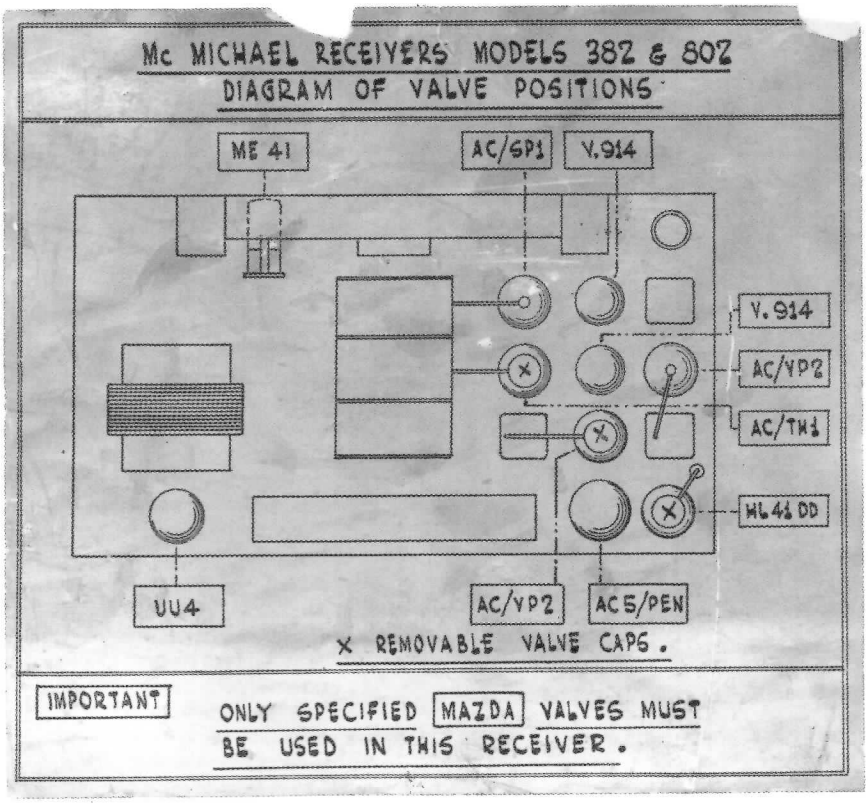
corrosion until they too were plated. The only item that didn't need replating, but a lot of elbow grease to sort out, was all the copper trim on the set. The lacquer had been damaged over the years and the corrosion was rather selective, so all the lacquer and corrosion was polished off using Solvol Autosol. It was then relacquered using clear cellulose lacquer from my local motor factors.

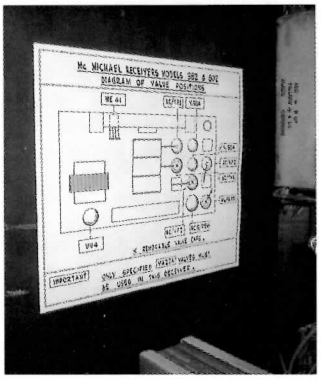
A local plating company did the work on the chassis for a very reasonable £20- however, I did spend no small amount of time finding a plater who was willing to undertake such small items for so little return (I assume they got put in with someone else's job). Now, presented with a clean and shiny chassis, I had to set about making the electronics look as good as the metalwork. Plus of course, they had to work too...

So I cleared the bench completely (a rarity), unpacked the electronics and carefully laid it out. The valve holder assemblies in the set were individually disconnected, again with notes and labels, and cleaned in a (borrowed) ultrasonic bath. This got rid of all the years of grime, gunge and that paint, and I was now in a position to restore each assembly in turn. Resistors were individually checked for value, and those out of tolerance were replaced as sympathetically as possible with near-original components, also checked for value. The valveholders themselves, where stubborn stains persisted, were cleaned with fine wire wool, blown through with compressed air and then given a wipe with WD40 on the paxolin surfaces- the contacts were cleaned with a smooth rat-tail file.

Then came the oft- vexed issue of what to do with the waxed-paper dielectric capacitors. As this set was going to be the centrepiece of my collection, they were opened and the contents removed, then new axial-leaded polyester components were inserted inside, packed out with tissue paper and resealed with church candle wax, as it's about the right colour. Everybody who does this has their own way of doing it, and I used a hot air gun to soften the wax before pulling one end out and then using a piece of fine-bore copper pipe to push out the contents. This method at least leaves one of the original crimped ends of the cardboard tube intact. The capacitors in this set had a spiral of wire at







each end to make contact with the original foils, so these were remade from tinned copper wire and soldered together. I left a small hole to pass the new component's lead-out wires through ready to attach to the new wire/end caps. I'd point out here that on sets I know I'm going to keep, I'd do this anyway. If it's a repair for someone, unless they pay me extra for the time involved it ain't gonna happen!

The cardboard-cased dual electrolytic that decouples the output and DDT valves was opened in much the same manner-using a hot-air gun- but then a blunt table knife was used to prise open the end flap of the box. When refilled and waxed, the original tape holding it closed was recreated using unbleached cloth tape, then given a coat of French polish with a soft brush. The main smoothing electrolytic, which had the odd values of 8 + 28µF, was again an improvisation: I used a modern 8 + 32µF component obtained from Gerry, but this time hidden inside the shell of a cardboard-cased NSF electrolytic designed for fixing to a baffle; it had brass eyelets riveted in to the flanges of the box. Admittedly it wasn't exactly the right component- I had next to no hope of finding one of those- but the end result looked an awful lot better than a bright blue polythene-covered can in a shiny metal clip! The tall 8µF electrolytic that decouples the HT supply was from a stock I bought from Colomor many years ago when they were still down the Goldhawk Road. What a shame they're not there now- I used to enjoy going to get valves in my lunch hour!

The one part of any set that bothers me is the condition of the wound components, as if they've failed they're invariably problematic to repair/replace. These were checked for continuity and mercifully, all were good (or so I thought...). So at least I didn't have to go pleading for coil-winding facilities, especially as this set has variable selectivity IFTs to add to the confusion. That's the electronics covered, what about the electro-mechanics?

The major problem that faces anyone who undertakes the restoration of a motor-tuned radio is the condition of the contact fingers that form an essential part of the system. Not having ever taken an EMI set to pieces to see how they went about it, I couldn't comment; but most manufacturers used a "direct-homing" unit, either the "Plessey" mechanism (Ekco, McMichael and Defiant to name a few) whilst RGD used the "Garrard" mechanism or another, manufacturer unknown. Murphy, in their own inimitable style, used a variant of the Plessey device. EMI of course, did it their own way (but it's a variation of the same theme), and the less said about Philips the better- the redeeming feature of the Philips mechanism being that it didn't use these fragile current-carrying contacts. None of these, I should add, compare with the elaborate mechanism used by the Bavarian company SABA in their 1938 model 980WLK- a set that tuned itself! This used a self-seeking contactless mechanism with an electronic servo mechanism to drive the motor- the servo being controlled via the ATC system.

The contact fingers are made of brass, which over the years work-hardens and becomes very brittle; eventually the fingers fall off. This is what had happened to my set, and of course all the corrosion didn't help matters either. The adjusting screws had all seized and really, there was nothing worth salvaging. So it was out with the side cutters, cut all the connections off and throw the selector rings away- saving only the fixed contacts that are used for manual tuning. These are set to the limits of the gang travel so that you can tune over the full range (obvious really). Remedy came in the shape of a selector mechanism removed from a scrapped (not by me, I hasten to add) Ekco PB189. Again, most of the fingers had shuffled off this mortal coil, so I removed what was left and then remade them using contact fingers salvaged from a "Continental"-type cradle relay. These had the necessary small, hard points required to both resist wear and provide a positive stop for the mechanism. The insulating strip in the disc is quite small to provide a reasonable resetting accuracy, and here's a tip for anyone restoring a motor-tuned set: if your strip is burnt, it can be turned around as they're usually made symmetrical. Burnt strips make the mechanism judder as it comes to a halt, then overshoots. Ekco did this deliberately (make the mechanism overshoot, that is) in their PB510/515 models, but they're a different kettle of fish altogether.

Eventually the time came to reassemble it all. The photograph shows the chassis after all the replating and reassembly had been carried out, but before the contact fingers had been made up or the tone and wavechange indicators had been refitted. The dial responded to a clean with detergent, as it is silk-screened aluminium. All the rewiring was carried out in silicone rubber wire where appropriate, the new cloth-covered hook-up wire being obtained from Antique Electronic Supply in Arizona. The dial drive was restrung, and eventually the chassis was ready for refitting in the cabinet. New nuts, screws and washers were used where possible. A new length of suitably period mains lead was obtained from supplies that Bob Tucker once had. It then underwent the usual testing and alignment.

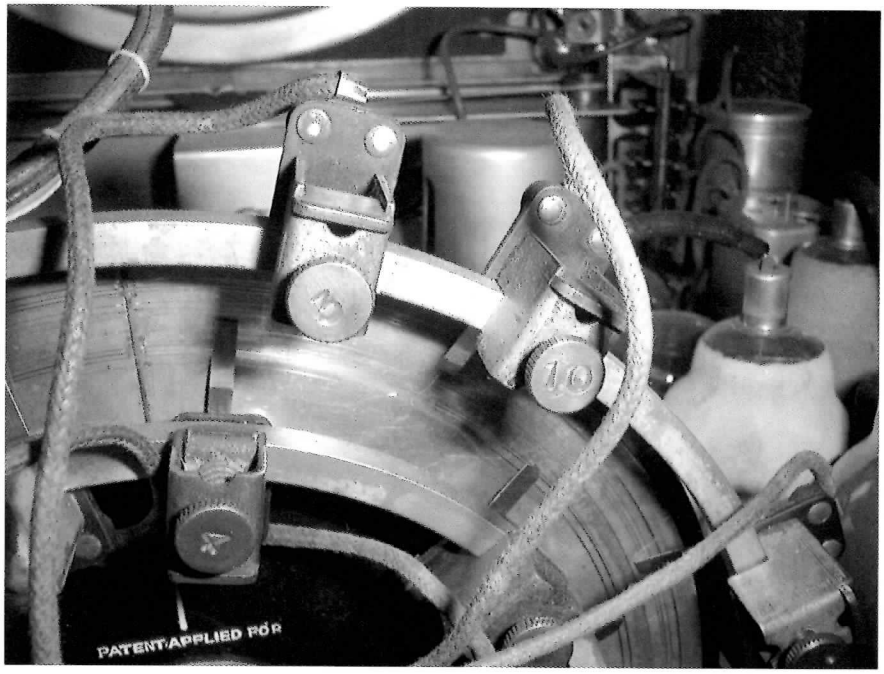
Restoring The Cabinet

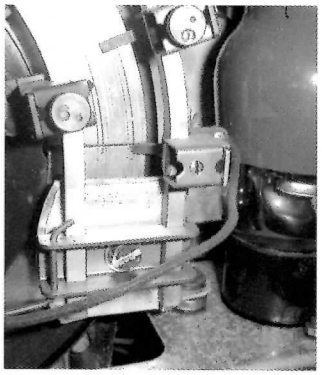
First, I had to resolve the issue of the missing moulding near the loudspeaker. I'll freely admit that I'm rubbish at woodwork- I could never cut a straight line. I needed the help of someone experienced in these matters, so I returned to where the set had come from- Gerry's. I asked Charles Farnham-Smith (Gerry's one-time lodger) if he wouldn't mind making me one. He kindly made me a pair, at no charge. I put these aside ready for the next stage. The cabinet was stripped down as far as possible to its component parts, along with internal labels etc., then of all its finish using Rustin's "Strypit". It was then treated with liberal quantities of anti-woodworm fluid, despite the absence of any indication of these abominable creatures (can anybody tell me exactly WHAT purpose on God's Earth they serve?). This revealed two things:

* The quality and figuring of the veneer on the front was too good to hide under the sludgy, dark brown finish previously used, but...
* The quality of the veneer on the sides fell way short of that on the front- it became clear that the polish was the colour it was to hide the cabinet maker's sins. A Murphy cabinet it wasn't.

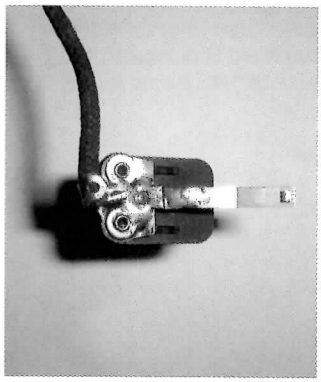
So a compromise in the colouring was made, along

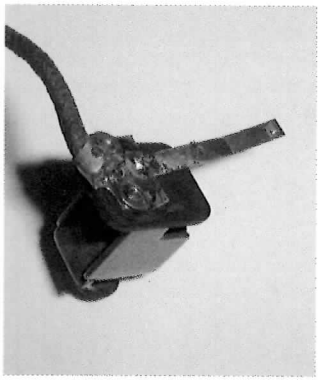
continued on next page





Detail of the motor-tuning contact clips





with some judicious cabinet repairs. I applied the stain to the woodwork using a modeller's spray- now I would add it to the polish when it was being sprayed. The finish chosen was again from the Rustin's stable- Plastic Coating. This has the great advantage that it can be brushed on, as at the time I didn't have access to spray equipment. The high "build" quality of the finish means that it can be cut back quite vigorously to level it ready for burnishing to that "piano finish" mentioned in the catalogues. I did find that you have to be careful when applying the finish with a brush, as not only is running more of a problem, but the lacquer itself is prone to bubbling as the solvent used can attack the previous layer. The hazards are covered in the leaflet accompanying the kit version of the lacquer. This doesn't appear to be a problem (or at least, it's greatly diminished) when it's sprayed and this, coupled with the greater colouring flexibility and superior finish, is the reason I've latterly switched to spraying. Once complete, the inside of the cabinet was painted with slightly thinned blackboard paint, and the edges and rear with brown Humbrol enamel to match the original.

The other reason I chose Plastic Coating was that it was a good substitute for the original cellulose (at least I think that's what it was)- and let's lay to rest once and for all the myth that all radios were French polished. They weren't. Manufacturers varied- I know Ferranti used shellac lacquer, and I think Ekco too: Murphy though, used cellulose. In fact, Murphy instruction books are quite clear on this point: the instruction book for my A40C states-

"...The finish on this receiver is of a special nature combining durability with good appearance. It is a very hard cellulose polish (not a french polish) which normally will only require a light dusting with a soft duster. It is most important not to use ordinary wax polishes on the cabinet, as many of these will soften the cellulose and spoil the finish. A special polish called "Cerrax" is suitable for occasionally polishing the cabinet"

If you're refinishing a set, dab a bit of methylated spirits and then a bit of cellulose thinner on to the cabinet; what softens it will tell you what the original finish was.

A mention of the internal valve layout label must be made here. The original was in poor condition, but mostly intact. I needed a better one- after all, the words "ship" and "ha'porth of tar" sprung to mind. So I steamed it out of the cabinet (this got some very odd looks at home as it involved boiling the kettle several times inside the set) and then a very good friend of mine (Dave Grant) scanned the original into his computer (at the time I didn't have one) and retouched it using a picture editing package. Some of you may know Dave is/was the brains half behind Dinosaur Technology- the erstwhile manufacturers of FM-AM converters, 625-405 line standards converters, modulators and test card generators. I was the metal-basher/assembly half with occasional product ideas and enhancements. I digress though. Finally, the recreated label was reprinted on a laser printer and then glued back in to the cabinet.

The cloth covering the loudspeaker aperture was obtained from Gerry. Allegedly it's the back of an old sofa, but it's quite close to the original which, sadly, was too small to be reglued to the baffle- it having been removed prior to my acquisition.

The set was finally completed in time for entry in the 1996 Radiophile Concours délégance, where it took first prize. I think the lasting memory I have of that day is overhearing someone speaking to his friend and hearing the words "Have you seen that McMichael in the Concours? The bloke's built it out of nothing!" It's said that "Pride goeth before a fall", and it certainly did with my McMichael. Two weeks after my victory, I was still grinning like the Cheshire Cat whenever I switched it on and listened; then as I was listening to some music, I became aware of some unwanted accompaniment. A sort of fizzing, bubbling noise. This then gained a malodorous counterpoint. I then realised that this wasn't some Stockhausen-like intrusion, but a fault. I hurriedly pulled the mains plug out from the wall. The mains transformer, strained by being forced back into life from its dormancy, succumbed to shorted turns. I removed it when I could overcome my dismay and let those fine people at Majestic in Poole rewind it. The set then finally gained its long awaited place as my collection's centrepiece.

As an aside, one of the reasons that spurred me into writing all this down was Fraser Donachie's article in the Bulletin (vol. 24 no.1) I disagreed with every aspect of it and found its avaricious overtures somewhat distasteful; there are better things to invest in than radio sets. Consider this, however:

Go and look at the "before" pictures again, and take a really good, hard look at them. Now, if you were of Fraser's mindset and were only considering its future value, would you actually contemplate preserving it? Somehow, I doubt it and the set would at best be cannibalised for parts for a more "worthy" set and more likely would end its days crushed and buried in a landfill site, lost forever to future generations. I would mention in passing that I find those people who vandalise perfectly good radios and radiograms in the name of some misplaced and irritating reverence for the PX4 are even more contemptible. How this fits in with the BVWS' charter "...to preserve early wireless equipment" I'm not sure, but this is another matter.

Yes, I'm probably more than a little irrational (well, I know I am) to have taken this on; Anne, my wife, likened me to some batty individual who collects injured animals! I've always been on the side of the underdog, the unfashionable (stand up the boy who said "That's why he collects Bush sets"!); and like the late Pat Leggatt, dislike the elevation of form over substance, something that is becoming prevalent in all aspects of modern society. So a set that is in such poor condition is bound to attract my attentions: that however is NOT a cue for you all to ring me up with all your sets found in the bottom of a peat bog that you want rid of. Yet, with careful attention to detail, studying the manufacturing processes of those glory days of radio, and learning how to conserve and restore properly (as opposed to putting it in a bag in a shed or attic and waiting/hoping for its value to increase), a worthless piece of rubbish has been turned in to a useful and reliable piece of furniture, that also serves as an entertainer. It entertains by the programmes that can be received on it, and in this particular set's case, entertains those who don't appreciate our earlier technological history by its mechanical wizardry- push the buttons, see the pointer move! I always find it fascinating to watch the faces of people who've never seen a motor-tuned set before, be they my teenage niece or my mother (who was seven when this set was announced); there's a captivation

that no modern digital readout set can ever produce.

With proper care and conservation, this set will in all probability outlast me, and will hopefully go on to interest and captivate those who come after us. Our responsibility is not to bag up a set and hope that it will provide for us in our dotage; it is to learn all we can about its history, its social context, how it was made. We have to learn how to perfect the invisible repair (and be honest enough not to try and pass it off as original). We have to learn how to refinish the cabinets properly, to make the best use of the services and materials around us and pass all this on to future generations so that they can place their current technological standpoint in its proper perspective. In Fraser's eyes, it is probably worthless now; but I never was interested in any future resale value- most of my collection wouldn't exist at all if that was the case. Its value to me is that I could do all that I did to it.

Yet, for all this work, it only came third in the Harpenden restoration contest...!

Rider's Manuals continued from page 31

TRFs. Some of the former had full-wave detectors, but this was a short lived fashion. De Wald produced a model with two valves in parallel used as an anode bend detector, and one of the Howards has a note pointing out that one section of the tuning capacitor is not used. Atwater Kent produced a wonderful device called the Tune-o-Matic, which involved not only motor tuning, but a clock, so that you selected what programme you wanted to hear at what time.

Vol 6. Having recovered from the depression things got a bit more interesting and adventurous. Emerson in their model 19 got really weird. This uses the good old 6F7, but the triode is a neutralised if amplifier and the pentode is a leaky grid detector, with AVC from the grid leak. The Stromberg model 70 had two RF stages on short wave only, and the Howard Explorer had (deep breath) two parallel valves for each of two if amplifiers, and another two for the leaky grid detector. Another parallel pair form the first audio stage, and then it gets a bit more sensible, with another stage of audio (one valve), a phase splitter (another) and four 2A5 pentodes in the output. These are biased by their own rectifier and the HT is supplied by the usual type 83. Nineteen valves in all.

This, however, is beaten hollow by the Zenith "Stratosphere" with its eight output valves, which with three rectifiers scores 21. As far as I know, this was the largest output stage ever used; the others threw in their hands after this.

After this the four-valve superhet ruled the roost, with only the occasional oddity. The first TVs appeared in Vol.7, and the first FM sets in Vol 9. (40 MHz band).

I don't know how well some of the more adventurous designs actually worked; but full marks for trying.

The production quantities involved were absolutely staggering. In 1929 Grigsby Grunow (Majestic) made 4,000 sets, and Atwater Kent 12,000, a day! In 1930 an industry total of 3,827,000 sets was made. The servicing of these quantities must have been a huge business, and fully justified Rider's investment.

I suppose Molloy & Poole is the nearest we ever got to an English equivalent of these amazing volumes. The loose-leaf format of Rider, however, makes photocopying easy. If you want a circuit for a Gamble-Skogmo,

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Living in the past

by Clive Hooley

Over the years my wife and I have developed a love of Art Deco and have spent much time and effort putting our unmodified pre-war semi back to how it might have looked in the 1930's, all our furniture, carpets, fixtures and fittings are original to that wonderful period.

Pride of place in any home would have been the wireless and accordingly one was found. But as any collector would know; one is simply not enough and before long shelves, tables and corners of rooms began to fill up. At first I collected anything with a valve in it, but as time went by I started to appreciate one manufacturer above all others in terms of construction, style and sound quality: Murphy.

I have Murphy madness, luckily for me the sets are still undervalued and building a collection doesn't cost the earth. I also collect pre-war dance band music on 78, it wasn't long before I had my heart set on a 1930's Murphy radiogram. I sent out 'wanted' ads and let anybody know what I was after. It took a while but I eventually got a call from a fellow collector who knew of an A28 RG in a house that was being cleared.

There it sat behind a door in a very gloomy room looking rather sorry for itself. The owner was clearing the house on behalf of his late aunt. The radiogram had most of its paperwork including a guarantee dated February 1936, an operating manual plus a pile of records. It was eagerly purchased and transferred into my father's Volvo to join the other Murphy sets I have amassed.

Back at home I was delighted to find it worked and rather well too, even the 'Automatic Tuning device' worked perfectly well, pulling in some quite distant stations with ease.

The priority, however was to get the gramophone section working in order to enjoy my record collection.

Some adjustment to the turntable motor was needed, the three rubbers mounting the motor were replaced as the original ones had hardened in the previous sixty years thus transferring vibrations to the pickup. The screened pickup lead was also replaced, the old one had a break somewhere and had an annoying habit of cutting in and out halfway through a record. It sounds absolutely amazing, and with a new needle an unworn 78 will fill the room with a very deep and detailed sound. Murphy had gone to a lot of trouble to eliminate cabinet vibrations. The speaker is mounted on a heavy duty shelf and internally has no contact with the front baffle so that the only part that moves is the loudspeaker cone. The speaker is housed in its own damped enclosure completely open at the rear. The radiogram needs two people to lift it and the sound has a real depth with none of the 'boom' associated with other sets.

Recently we had our house filmed for a 1930's special on Channel 4's 'Collector's Lot' and the radiogram was used to supply the vintage sounds. The

continued on page 41

Minutes

Minutes of BVWS Committee meeting held on Thursday 1 July 1999 at 5 Templewood, Ealing

Present: Mike Barker (chair), Jeffrey Borinsky, Ian Higginbottom, Steve Sidaway, Guy Peskett, Carl Glover

1. Apologies: none (all present)

2. Minutes of meeting held on 6 May 1999 Item 5, the £8 cost of overseas mailing (determined after the meeting) was approved and inserted. The numbering was corrected. The minutes were then approved.

3. MB estimated that about 20 applications for membership had arrived while he was away, and 24 applications from the Society's web site.

4. CG reported that the Autumn Bulletin is 80% complete. He is looking for a 20's set article for balance.

5. Rob Chesters has agreed to help CG produce the Christmas Bulletin. In view of the likely expansion of the Bulletin team next year into Editor, Designer, and Editorial Panel, a proposal that the Society purchase a computer system was discussed. This system would need to be compatible with that currently used by the Editor (which is not Society property). A suitable Macintosh system has been identified at a cost of £1349 + VAT. (approx) JB made it clear that any purchase will need to be carefully phased to avoid cash flow problems at the end of this year. He recommended purchase in August with the option of 6 months free credit taken up if a decision to go ahead is made.

6. GP tabled a draft of proposed terms and conditions for Society auctions. Some improvements were made in discussion. GP was asked to send the amended draft to Ron Deeprose for his comments and suggestions. When the final text is agreed it will appear on the first page of all future auction catalogues.

7. A special mailing will be made in August to issue Harpenden notices, details of forthcoming auctions, and the Members handbook. GP was asked to produce a list of UK Museums for the Handbook.
8. An discussion of trading practices took place but no conclusions were reached.

9. MB suggested that members be reminded that the value of their collections might not be recognised by surviving relatives and that it is important that estimates of value and clear instructions for disposal are set down (preferably in wills). This advice would appear either in the next "From the chair" or in a forthcoming article on collecting.

10. AOB, None

11. The next meeting will be held on 2nd September at Templewood.

The meeting closed at 10.00 pm

Minutes of BVWS Committee meeting held on Thursday 2 September 1999 at 5 Templewood, Ealing

Present: Mike Barker (chair), Jeffrey Borinsky, Ian Higginbottom, Steve Sidaway, Guy Peskett.

1. Apologies: Carl Glover

2. Minutes of meeting held on 1 July 1999
Minute 5: End should read ...option of 6 months free credit taken up. This was agreed. Information added after meeting, the price had increased to £1800 inc VAT to include a more suitable Printer solution.
Minute 6: GP reported that the proposed auction rules had been sent to Ron Deeprose for comments.

Minute 7: MB reported that the list of Duncan Neale's items for sale by auction which we had planned to circulate to all members had not arrived, and that Bulletin posting should not be held up.

Minute 9: MB action complete.

The minutes were then approved.

3. MB reported that the membership currently stands at 1274 and that non renewers had now been deleted from the database.

4. CG reported that the Autumn Bulletin is with the mailing team and that the Christmas Bulletin was nearly finished.
5. JB reported that as a result of incurring exceptional heavy expenses this year, of which the History was a major item, the reserves were expected to fall to a low level for a short period at the end of the year.

6. MB tabled a membership list in a format suitable for inclusion in the handbook and reported that a list of wireless related museums (obtained from Andy Emmerson) had also been put into a suitable format. However in view of the work still to be done and the lateness in the Society year he proposed that the handbook not be issued this year after all. An apology would be issued "from the chair " in the Christmas bulletin and at Harpenden. A commitment will be made to send out a 2000 Handbook in Jan/Feb.

7. MB proposed that items to be issued with the Christmas Bulletin should include Marconi commemorative brochures (instead of Christmas cards) and a second members supplement for 1999, Trader sheets on CD-ROM with the kind permission of ERT. Agreed

8. SS reported that the preparations for the forthcoming Harpenden meeting were complete.

9. AOB (i) SS reported that pressure of work would force him to stop organising the Harpenden meetings after November. He would be able to retain the Committee position of Coordinator role.

(ii) Although no elections of sitting committee members are due this year we are still short of a Membership Secretary. MB proposed to appeal for candidates (again) this Christmas.
(iii)MB reported that renewals were still coming in! The fact that members who don't attend meetings automatically have back numbers sent to them on renewal provides no incentive for early renewal. MB proposed that back numbers are not sent on late renewal after the first Bulletin posting, around the first week of March each year. Agreed.

10. The next meeting will be held on Thurs 25 November at the Vintage Wireless Museum Dulwich..

The meeting closed at 10.00 pm.

Duncan Neale Collection continued from page 9

volumes covering two or three years. Prices varied from in excess of £200 for the pre-1920 lots, through a little over £100 for the lots up to about 1926, and progressively less as the years rolled by. Two lots covering the years from 1935 to 1939 bucked this trend by returning to £200. Complete runs of the Wireless World in well bound volumes do not appear outside the doors of professional book dealers and at high prices, so these were a very good buy for the serious historian. A Dowsett's "Wireless Telephony and Broadcasting", nicely bound in the usual two volumes made (£140) and "Modern Wireless" by Robert Beare attracted strong bidding taking the price to (£920.) These rare books in three volumes are hardly ever seen in auction and the first volume was complete with the folding model of a detector unit. Even so, I thought the price might be on the high side but the buyer was both knowledgeable and happy, showing that a reasonable price had been paid.

The Duncan Neale Collection was a landmark event as well as a successful auction and I suspect that Marjorie Neale and Dreweatt Neate were pleased with the result. The event, with its pleasant location, ample space and free from the more formal style of the London houses, was a breath of fresh air as well as an enjoyable gathering of friends. In the end I bought nothing, but if I had felt more determined on the day, the one piece I would have pushed the boat out for was lot 491, a McMichael Autodyne 7 valve superhet in a walnut cabinet, still as new (£700). Easy to miss as an oblong box, the cabinet actually folded away on hinges to reveal an Aladdins cave of vintage technology in absolutely pristine condition. Quite stunning.

BVWS statement of accounts 5th April 1998 to fifth April 1999

	1998/99	1997/98
Income		
Subscriptions and donations	£19,231.20	£20,343.53
Sale of publications	£273.64	£132,30
Meetings	£4,127.32	£4,082.71
Interest on deposit	£105.64	£115.31
Total Income	£23,737.80	£24,673.85
Expenditure		
General expenses	£5,714.51	£4,174.96
Bulletin costs	£13,649.47	£20,941.09
Extraordinary items	£—	£—
Total expenditure	£19,363.98	£25,116.05
Income surplus (deficit)	£4,373.82 Matched by a corresponding increase in assets	£442.20

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

Assets	**1998/99**	**1997/98**	**Movement**
Current account	£25,428.53	£21,160.35	£4,268.18
Deposit account	£3,721.15	£3,615.51	£105.64
Giro	£383,39	£383.39	£
Cash	£	£	£
Total assets	£29,533.07	£25,159.25	£4,373.82
Increase in assets	**£4,373.82** matched by a corresponding income surplus		

Jeffrey Borinsky
Honorary Treasurer

I have examined the accounts and books of the British Vintage Wireless Society and confirm that the statement of accounts is in accordance with these records.

Peter Weiss FCA

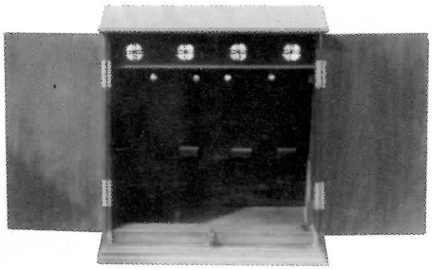
'Living in the past' continued from page 39

sound engineer who was with the film crew was quite taken with the sound of the radiogram and 4 pieces of music were recorded acoustically from the 'gram in order to be dubbed over the programme. The crew spent a whole day filming in order to produce five minutes of programme. The Murphy was filmed and I hope it will be shown.

I have many small pretty bakelite sets in my collection which are worth more than the Murphys but they just don't have the magic of that manufacturer. It still amazes me that they are so inexpensive for the collecto; perhaps Gordon Russell's cabinet designs are still too radical for many collectors or maybe it's the size. At any rate they give me a lot of pleasure and that's what it's all about. Has anyone got an A40 RG that they don't want?

Gerry Wells celebrates 70th birthday

Gerald Wells succesfully reached 70 this year and celebrated in grand style with several BVWS members and close friends present. Notable at the party was the Ekco AD65 (in blue!) birthday cake made by BVWS member Chan Sunderam.



Above: can anyone help Mike Butt identify this 'smoker's cabinet'.

Left: a photograph sent in by Frank Hawkins taken in early 1950 of the shop that he was branch manager of at the time - 'J&M Stone of 6 Regent Street, Swindon. Stones were the largest radio retailers in the world with 570 shops across the globe.

Dear Editor

The excellent article by Ian Liston-Smith on his KB FB1O in the last issue of the BVWS Bulletin has prompted me to write about my experience with one of these sets.

I came across it at a local boot sale in a grubby condition but with the cabinet and scale intact. In spite of a lot of haggling I was unable to get it for anywhere near the £10 paid by Ian. I eventually had to pay £34.

The first job when I got it home was to remove the chassis and re-form the electrolytics as it had obviously not been used for a long time. I cleaned the chassis and replaced all the paper condensers (I still use this word) and then switched on. The set performed very well with good sensitivity, only a slight repositioning of the pointer was all that was required to correct a small calibration error.

However it was plagued with a loud modulation hum on strong stations. Like Ian I had replaced the de-mod condenser where it had been originally fitted from the anodes of the rectifying valve to chassis. This can be seen clearly from the photograph in his article. I removed it from the anodes and connected across the switched side of the mains switch, mounting it directly on the switch itself. This completely cured the trouble. I note from the copy of the Trader sheet printed on page 6 of the Bulletin that this is where it should be. It must be that both Ian's set and mine were early models and that this change was made in production at a later stage, yet the release date was September 1950 and the trader sheet is dated October 28th 1950.

The cabinet was then given attention. I wanted to retain the original speaker silk although this had badly faded. It was glued to a sort of pressed paper baffle which was glued to the inside of the cabinet grill. Over the years the glue had deteriorated and I was able to carefully prise off the baffle complete with the silk without damage. It had faded in brown horizontal stripes, but where protected by the grill bars it had retained its original bright green colour. So I removed the silk from the baffle and repositioned it so that only the bright sections would be visible between the grill bars. Before refitting this I removed the scale and handgrip aperture cover, washed and polished the cabinet, resprayed the fibre aperture cover, cleaned the scale and knobs then re-assembled the whole lot.

I now have this nice example of this popular little set in near original condition in my collection in full working order with a performance as near as I can remember to those I used to service in the 1950s.

Yours faithfully
Peter Roberts.

Dear Editor

With reference to 'Another Battery Eliminator' by Gary Tempest in Volume 24 No. 3, I would like to draw readers attention to an earlier design: Dec 91 Volume 16 No. 4. This circuit has the advantage of current limiting and short-circuit protection.

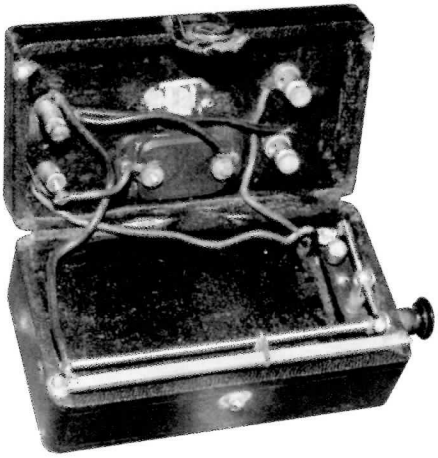
Yours sincerely
Peter Smith.

Dear Editor

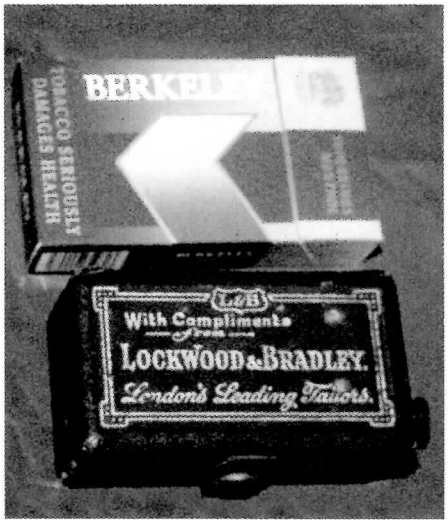
I feel I must reply to Gary Tempest's comments in the Autumn Bulletin on battery eliminators. While he is correct that my design of high frequency converter does not eliminate a battery, it is not true that it needs a car battery to drive it. Perhaps it should not have been called a battery eliminator but a converter, as the purpose of it is to replace an accumulator, HT battery and grid bias battery with one relatively small low voltage source such as a rechargable lead acid battery. It will of course work from ordinary dry batteries, but this is a rather expensive way of powering a valve set. The idea was to make the converter and battery small enough to fit in a "transportable" set, thus freeing it from the need for a mains supply connection. My definition of transportable here is a set with a handle on the top.

I also find it interesting that having decried Andrew Zimmer's design for needing a home wound transformer, he explains the details of adding two extra windings to a ready made product to provide the necessary supplies. Perhaps in some future edition I will provide details of my home made Meccano coil winder which I use to wind small coils and transformers. The best feature of it is an electronic counter (from Maplin) which gives the number of turns by a cam operated micro switch. I find counting the turns the most difficult part of winding transformers.

However all that said, Gary's design is very comprehensive and would be a useful and relatively inexpensive supply for running any



Above and below: Reg Dykes' unusual crystal set (see letter on page 44).



battery receiver.

Yours Sincerely
Graham Dawson

Dear Editor,
Please find enclosed two photographs of the cabinet of an early 20's set which hopefully somebody will be able to identify. This, which belongs to a friend, has a sloping front with four fretwork decorated valve viewing ports, the back panel has a BBC transfer and holes marked with ivorine discs for aerial, earth and speaker connections.

Turning to a different subject, the following idea may be of use in restoring early TV's with EHT supplied by mains transformer, by providing additional protection to these vulnerable components.

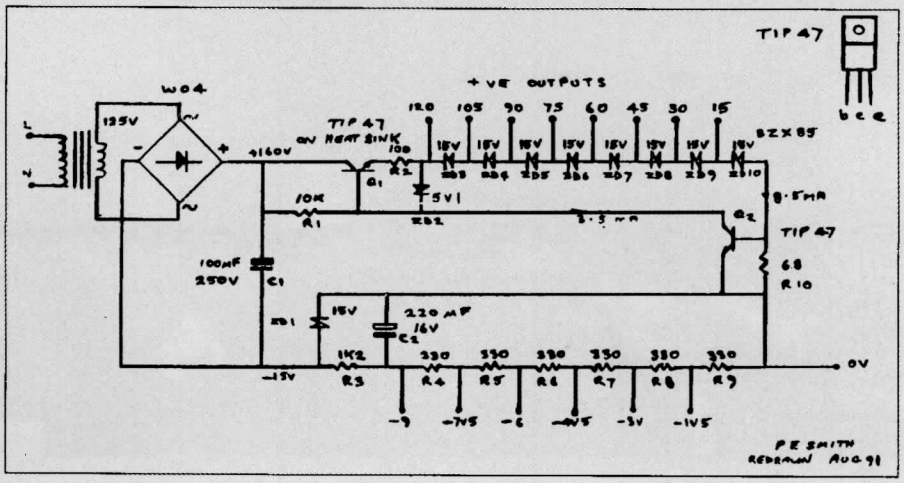
The circuit normally used in these televisions is shown in Fig.1. The capacitor 'C' charges to around the peak voltage of the positive going part of the waveform from the transformer, which may be 6KV, on the negative part the end of the transformer secondary connected to the rectifier anode swings an equal amount the other way, which means there is a voltage difference of up to 12KV between the heater winding and this point.

The modified supply in Fig. 2 should reduce the voltage on the heater winding to around chassis potential on the negative swing through the potential divider formed by the reverse leakage of the diode 'D' and resistor 'R', and thus the stress on the transformer. The added components can be hidden under

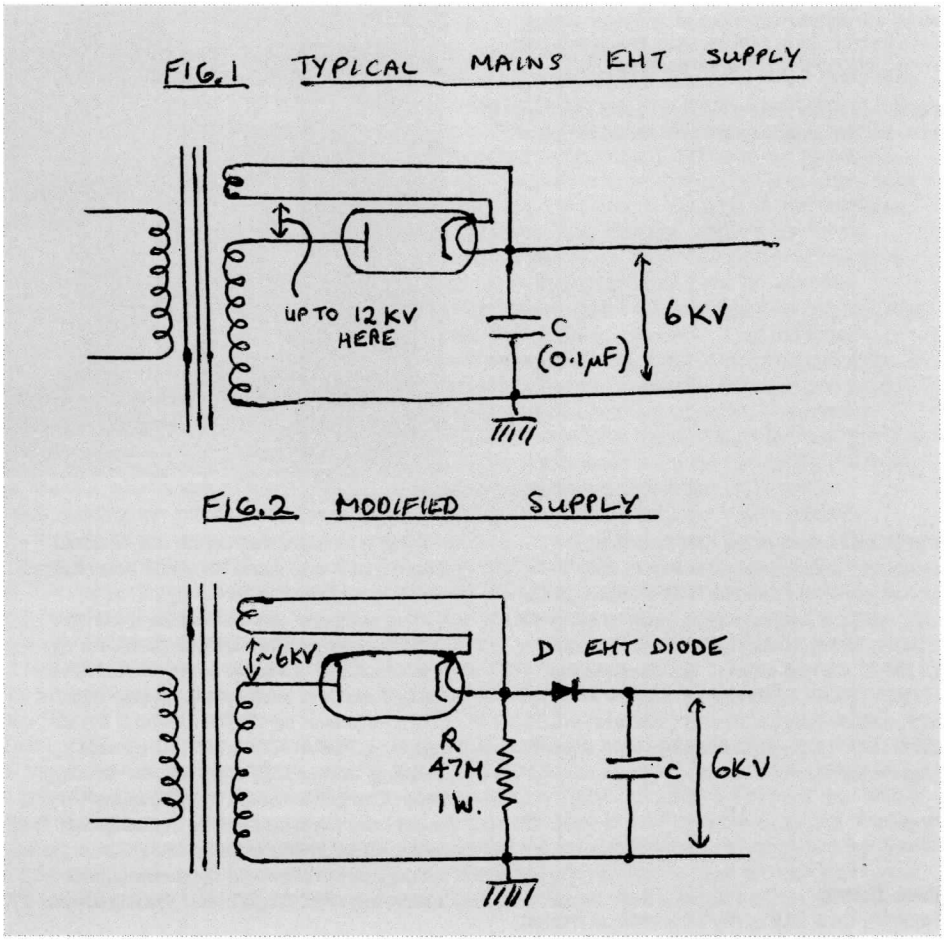
Several years ago I designed a universal battery eliminator and have built several to the same basic design. I have enclosed the circuit which may be of interest.

The design is simple in concept and has several useful facilities.
(1) Transistor Q1 acts as a current limitor. The resistor R2 sets the limit to about 45MA.
(2) The output positive voltages are set by the 15V zener diodes ZD3 to ZD10 and are therefore stable with varying loads. Different values of zener diodes could be used to obtain any output voltage.
(3) The transistor Q2 controls the standing current through ZD3 to ZD10 at about 8MA. Resistor R10 can be increased to 330 if the grid bias circuit is not required.
(4) The grid bias is derived across the 330R resistors R4 to R9, again these can be varied to obtain obscure voltages. The zener ZD1 stabilises the bias voltage when varying HT currents are drawn.
(5) The transformer output voltage is not critical but at DC voltages above 180V R1 could be increased to reduce the current in Q2.
(6) The transistors are well rated at 250Vce and cost about 80p each. The 15V zener diodes are 1.3WATT devices at about 20p each.

Below: the Eliminator Circuit



Above: Peter Smith's battery eliminator circuit as reproduced in BVWS Bulletin Dec 91 Volume 16 No. 4.
Below: Mike Butt's suggestions in restoring early TV's with EHT supplied by mains transformer.



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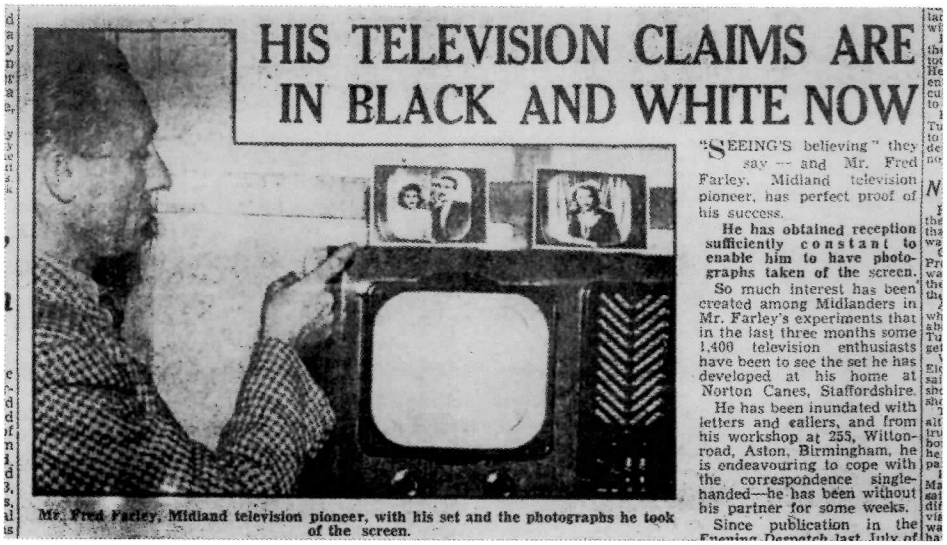
Above: S F Farley's fathers 'service department shop' which was called M.T.R (Midland Television and Radio) at 255 Witton Road, Aston, Birmingham 6, where he had the original idea of having the service department in the front of the shop. Please note the immaculate condition of all the equipment.

Right: Fred Farley making the local papers with television reception in Birmingham from Alexandra Palace.



HIS TELEVISION CLAIMS ARE IN BLACK AND WHITE NOW

"SEEING'S believing" they say — and Mr. Fred Farley, Midland television pioneer, has perfect proof of his success.

He has obtained reception sufficiently constant to enable him to have photographs taken of the screen.

So much interest has been created among Midlanders in Mr. Farley's experiments that in the last three months some 1,400 television enthusiasts have been to see the set he has developed at his home at Norton Canes, Staffordshire.

He has been inundated with letters and callers, and from his workshop at 255, Witton-road, Aston, Birmingham, he is endeavouring to cope with the correspondence single-handed—he has been without his partner for some weeks.

Since publication in the Evening Dispatch last July of

Mr. Fred Farley, Midland television pioneer, with his set and the photographs he took of the screen.

the chassis, taking care that insulation is adequate, and the valve rectifier is still in circuit; some of these such as the U21 and U22 are slow heating which helps to bring the EHT up slowly, reducing stress on the tube. Diode 'D' can be an EHT type such as the BY8414 (14KV 5ma) and 'R' can be 47 Mohm high voltage resistor as sold by Maplin (V47 1 Watt 10KV DC). Any comments from anyone else on this?

Regards
Mike Butt

Dear Editor,
Recently on a tour of my local antique market, I found a small pocket crystal set. It would seem that it was made as a give away item, if a suit was purchased.

The set looks very well made, and has 1920's components that look professionally manufactured. It uses a screw thread driven slider tuner and the smallest crystal detector that I have ever seen. The name on the lid reads, 'LOCKWOOD & BRADY. London's Leading Tailors. L&B' Also with the wording: 'With Compliments from L&B' suggests that it must have been by another manufacturer. The word 'GEM' is engraved on the stud on the lid. Of course the set could have been home made, with 1920's parts but some of them were very obviously machine-made. Does any member know of this set or have any idea of the manufacturer.

Yours Sincerely
Reg Dykes

Dear Editor,
Enclosed [see pictures above: Editor] is a picture of my father's 'service department shop' which was called M.T.R (Midland Television and Radio) at 255 Witton Road, Aston, Birmingham 6.

The business opened in 1929 and closed twenty years later in 1949 having traded throughout the war as an essential service.

My father (Fred Farley) capitalised on the fascination that people had for the workings of radio receivers by placing his service department at the front of the shop with a sales showroom at the rear.

This worked very well and caused tremendous interest, with people daily attracted to the shop window to view the 'men in white coats' performing delicate operations inside the backs of radios. Cutting edge technology stuff!

The workshop was always immaculate, as were the engineers. This was my father's policy because apart from being a functional workshop, the service department was a main attraction in Aston at that time and was a wonderful on-going advert.

I still have some relics from my dad's shop; the large chromium plated volt meters which (like the rest of the place) were kept polished daily by my mother Dorothy.

My father again used technology to advertise his business (loads of free editorial) when he hit the local papers with television reception in Birmingham from Alexandra Palace.

Most people had never seen a television set and my mother recalls the tremendous interest which this project generated.

I would love to hear from anyone who remembers my dad or his shop in Aston, or perhaps his business partner of the time: Jack Trim. I beleive that Jack's family moved from Birmingham to Bognor Regis in the fifties and had a dry-cleaning business.

Yours Sincerely
S F Farley

Dear Editor,
There have been several articles on Marconi's Magnetic Detector but none have offered an explanation of how it was intended to work and why it was better than other detectors of the time. I reckon you need to be a physicist rather than an electronics engineer to attempt this! Can any members offer an explanation?

Yours Sincerley
Gary Tempest

Dear Editor
As a 10 year lapsed BVWS member who rejoined at the October NVCF gathering, I had the chance to come up to speed by reading the 1999 Bulletins.

Frazer Donachie's piece in the Spring issue particularly took my interest. I think he makes a very fair point, and didn't deserve some of the reactions in later issues. I've been a vintage radio collector and researcher for over 30 years, yet only have a small number of sets-mostly early, and mostly unrestored but clean. His point that in future years unrestored sets in original condition will carry a premium is a good one - it already happens in the housing market. Unrestored old houses are now worth more in real terms and sell more readily than their jacuzzi-ridden characterless spawn, cloned from the latest fashion makeover handbook.

I do have vintage sets in working order, to which I enjoy listening every day, but they are ones that did not require rebuilding and only needed a simple fix to make them work. There are others, like Loewe sets, which are electrically intact, but which I have deliberately decided not to fire up, and another like the 1940 Majestic Gem, in my opinion, the first true 'personal portable' which has been left unrestored because the rubber covered wire inside is tender and is best left alone! Then there are the pre-broadcast items. They have been cleaned and tidied, but not rebuilt. You can't really use a 1915 spark set!

Frazer's point is well taken, particularly as so-called progress means that AM broadcasting will eventually be phased out; this will leave thousands of lovingly rebuilt sets with nothing to do unless they are fed by some sort of converter. This has already happened with 405 line television, and how many families actually sit down to watch 405 line black and grey TV?

As Frazer rightly said, it's very personal choice-but I didn't agree with his strictures on the dangers of 'pop' getting into a vintage set. I find my 1929 'straight' KB console model with its 12 inch moving coil speaker and 4 watts of PX4 audio sounds great on all types of music, and has done for over 12 years of regular use since I fixed it.

Yours Sincerely
Tony Hopwood

Dear Editor
In our last issue, John Booth proposed that the reason the ice warning from the 'Mesaba' to the 'Titanic' failed to reach the liner's bridge was because it did not carry the MSG prefix that denoted a captain-to-captain message. Although this may well be another strand in the tangled web of mischance that caused the disaster, it would have little if any effect on the outcome. The Titanic's navigating officers were well aware of a potential ice hazard. Seven wireless messages had already been received from other ships; all warned of a large ice field around the location of the eventual collision. The Titanic's lookouts had been alerted. Moreover, **after** the abortive 'Mesaba' message and about seventy minutes before the impact, a final ice warning was received and acknowledged by the Titanic, this time not by wireless but by Morse signal lamp from the 'Rappahannock', eastward bound from Halifax after damaging her rudder in the ice. There were contributing factors, but the single underlying cause of the accident was the Titanic's speed and her failure to see the iceberg in time to avoid it.

Yours Sincerely
Ian Higginbottom

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?

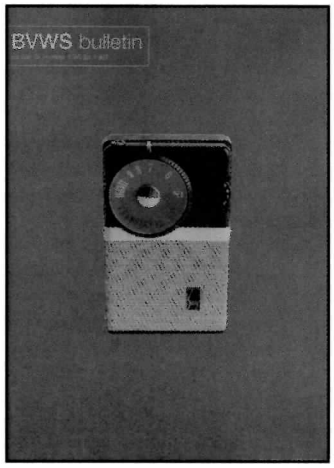
Vol 12 Numbers 1, 2, 3, 4 Inc. the Emor Globe, The Fultograph, Ekco Coloured Cabinets.

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 Ekco's.



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 Number 1 inc. Sonora Sonorette, Bush SUG3, RNAS Transmitter type 52b, North American 'Woodies'.

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

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

Postage:
for individual bulletins add 50p, for 2-5 bulletins add £1, for 6 or more add an extra 20p each. 23 Rosendale Road, West Dulwich London SE21 8DS Telephone 0181 670 3667. Cheques to be made payable to 'The Vintage Wireless Museum'.

News and Meetings

John Stokes

On Thursday 5th August John Stokes died. John was known as an author and radio historian, he founded the New Zealand Vintage Radio Society in 1972. John's three books "70 Years of Radio Tubes and Valves", "The Golden Age of radio in the Home" and "More Golden Age" are frequently used references by collectors in New Zealand and in other countries. John had a career in radio servicing starting before World War II with Turnbull and Jones. He served with the Royal New Zealand Airforce during World War II. During the 1960's John wrote a column for the New Zealand magazine "Radio and Electrical Review". He was the Editor of the NZVRS Bulletin for 12 years. He will be greatly missed by those who knew him and those who read his books and articles which were published in many different vintage radio society journals.

Ian W. Sangster,
President New Zealand Vintage Radio Society

Wootton Bassett meetings

Mike Barker will be organising a swapmeet on **5th December.** with special extended auction.

Audiojumble '2000'

John Howes' Audiojumble celebrates its eighth year at the Angel Leisure Centre, Tonbridge, Kent on **Sunday 13th February 2000**. See advert on next page for further details.

Blackpool meeting

A brand-new meeting for the north of England will be held in Blackpool on **26th March 2000** at the De Vere hotel, on the A587. There will be free parking, roughly 80 stalls and entry will be from 9.00 am to 4.30 pm. For further details, please refer to advertisement on the opposite page.

NEC Meeting 2000

Jonathan Hill's 'National Vintage Communication Fair' meeting will occur on **April 30th**. For further details on the NVCF please refer to the advertisement on page 2.

Harpenden meetings 2000

There will be an auction, a restoration contest and the AGM on Sunday **5th of March.** Sunday the **11th June** hosts a swapmeet. Autumn is heralded with a swapmeet on **3rd September**, and the year finishes with a swapmeet on the **26th of November**.

Gerald Wells' garden party 2000

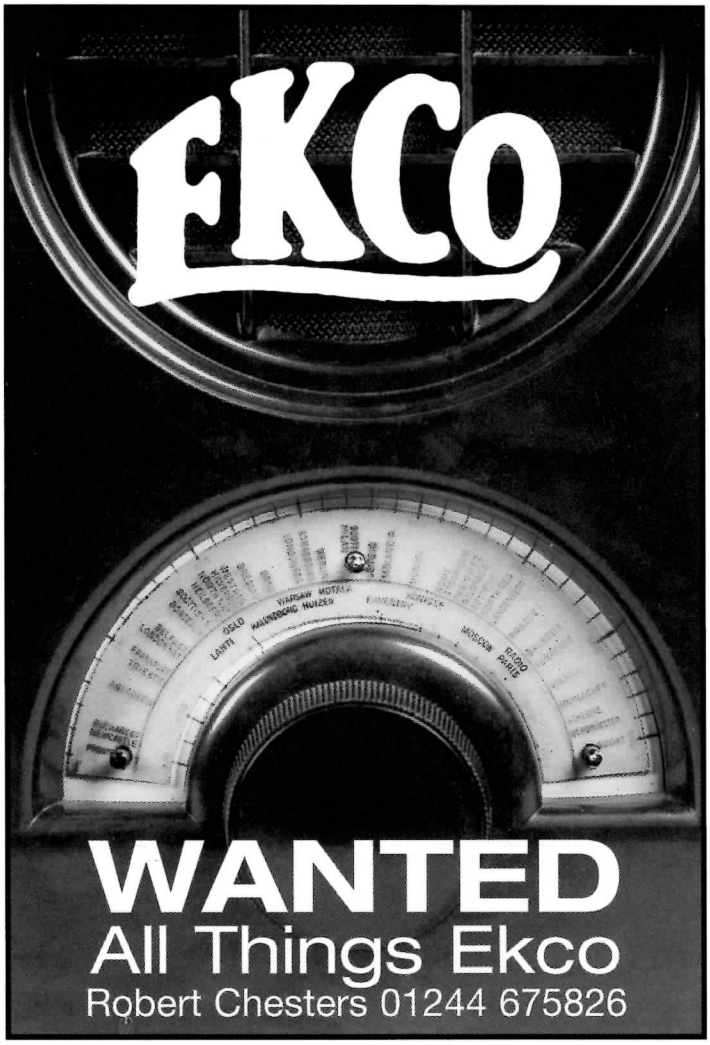
Gerry Wells will be having a garden party on Saturday **10th June** at the Vintage Wireless Museum, 23 Rosendale Road, West Dulwich, London SE21 8DS. Telephone 0181 670 3667.

New Articles

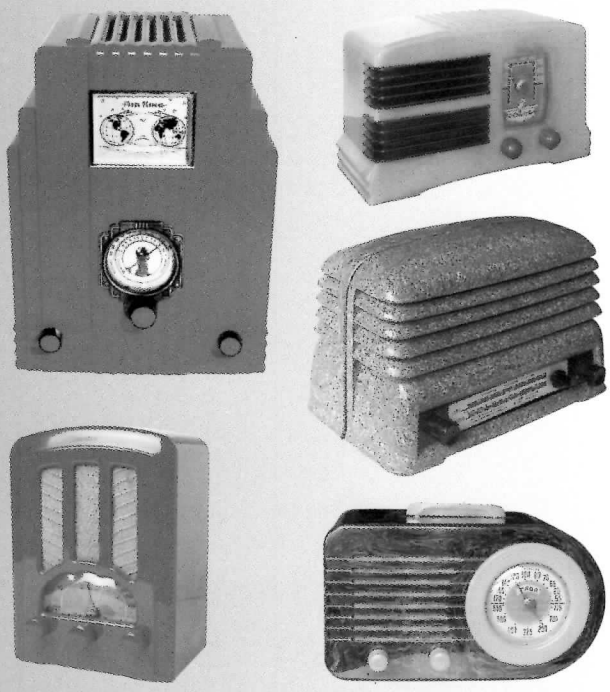
If you have anything interesting to say concerning Wireless, Television, Broadcasting, Collecting etc. please send it to the Editor for future publication in the BVWS Bulletin, as the Bulletin is only as interesting as the articles that comprise it. We welcome all suggestions and comments regarding the new appearance of the Bulletin and hope that it is catering to your needs as a collector / enthusiast / historian. Your article can be just a few paragraphs long as long as you think it conveys its message across to your fellow members.

Also if you have any photographic material that would look good in the Bulletin, don't hesitate to post it to the Editor. The chances are that I will definitely use it!

Please send all articles to: Carl Glover, c/o Runciter Corporation, 33 Rangers Square, London SE10 8HR.



Wanted by collector



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AUDIOJUMBLE "2000"

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10.30am - 4.30pm

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(Early entry at 9.30am £10.00)

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For a stall booking form contact John McGlynn or Brian Chesters at Vintage Technology:
e-mail: brian@blackpool.net
fax: 01253 300020
tel: 01253 300100 9.00 - 5.00

or write to:- **173 Newton Drive, Blackpool, Lancashire FY3 8ND**