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BULLETIN OF THE BRITISH

VINTAGE WIRELESS

SOCIETY

Lauritz Melchior broadcasting from the Marconi works at Chelmsford at July 1920. Note the Peel-Conner microphone with makshift trumpet – made from a cigar-box and sticky tape by Capt. H. J. Round. (Photo: courtesy Marconi)

BULLETIN OF THE BRITISH
VINTAGE WIRELESS SOCIETY

Editorial and advertisement enquiries should be made to the Editor, **Robert Hawes**, 63 Manor Road, Tottenham, London, N17 OJH. Tel: (081) 808 2838.

Editorial Assistant: Pat Leggatt.

Layout and design: Robert Hawes
Cover drawing: Norman Jackson

Information Exchange: A Register of Members' Interests

Members are invited to take part in this scheme, which is designed to provide a sort of clearing-house for information of all kinds between members. You may want to contact other members with similar interests to your own, or to acquire data, historical information, advice on restoration etc. Or perhaps you are willing to share your knowledge with other enthusiasts or to exchange visits? If so, you are invited to send details of your interests and of the help you are willing to offer to others, to the Registrar: (SAE please)

DAVE ADAMS
69 SILVER LANE,
WEST WICKHAM, KENT BR4 0RX.
TEL: 081-776 1531

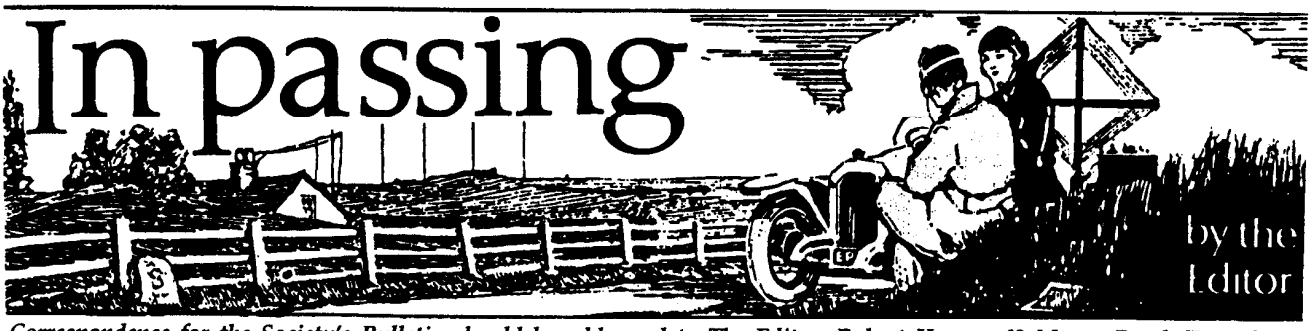
Contents: Bulletin of the British Vintage Wireless Society
Volume 18 no. 1

Information: inside front cover

VINTAGE WIRELESS MUSEUM

The Vintage Wireless Museum, headquarters address for the British Vintage Wireless Society is at 23 Rosendale Road, West Dulwich, London SE21 8DS. Telephone: (081) 670 3667. The Curator is Gerald Wells, whom visitors should telephone before visiting the museum.

In passing



Correspondence for the Society's Bulletin should be addressed to The Editor, Robert Hawes, 63 Manor Road, Tottenham, London, N17 0JH. Telephone: (081) 808 2838.

Disappearing heritage

When the British Vintage Wireless Society was formed almost 17 years ago, it represented a minority interest. The sort of objects which are now much sought after could be rescued from dustbins or bought for a song in street-markets, since they were not regarded as collectible antiques nor objects of commercial interest. The situation is very different today, when we are finding it increasingly difficult to acquire the objects of our studies, which, like other British "Family Jewels" are being sold to the highest bidders who are often in the business of exporting our heritage of technological history.

The latest threat to British collectors is the Common Market. Lessening export restrictions mean that things can be taken out of Britain and much more easily – and there are reports that whole collections are being whisked from under our noses by international auction houses and dealers.

These developments are of course inevitable but organisations like the British Vintage Wireless Society aim to help by providing direct contacts between collectors. Our Society has spawned several others in Europe, where we have always been anxious to form friendly links so that at least there can be a two-way flow of hardware as well as information. We will continue to encourage this entente, to our mutual benefit. We have members representing overseas groups who regularly come to our meetings and who offer an open invitation to us to visit their own meetings. The Editor would be pleased to supply enquirers with details.

Society meetings

Yet another venue has been added to the growing list of Society meetings, so that we now have about eleven a year, serving members in most parts of the country.

The newest meeting is planned for 4th July at the Memorial, Hall, Wooton Bassett, near Swindon in Wiltshire and members are asked to give it their support. We have to thank Mike Barker and Frank Hawkins, who both live in the area, for taking on the task of organising the meeting, which as in the case of our other regional meetings, is primarily intended for members in that part of the country – although of course, all members are entitled to attend.

If you are interested in taking a stall or just in attending please contact Mike by telephoning him on 0793 536040 or writing to him at 2 Cheney Manor Road Swindon SN2 2NS Nearer the date application forms will be sent to members.

Our most recent meeting, arranged as an experiment in Hedon near Hull was quite a success, serving members in the midlands and the north, attracted a good number of members. Thanks are due to Ernie Roberts and his helpers for organising the event which it is hoped to repeat later in the year.

Events for the rest of the year are: May 9th Portishead swapmeet; June 6th Harpenden swapmeet; July 4th Swindon swapmeet; July 11th Southborough swapmeet; September 5th Portishead swapmeet; September 19th Harpenden swapmeet; October 17th Southborough swapmeet; November 28th Harpenden major Auction.

Scottish Shows

Harry Matthews. founder of the Scottish Museum of Communication tells me that the museum's 1993 exhibition at Heritage Trust Building in Union Street opens in April and will run to September and will be open from 2 to 5pm at weekends.

This year it will feature broadcasting in Scotland including 70 years of BBC radio, 50 years of BBC television and 40 years of Independent television as well as putting their computer collection under the spotlight for the first time.

The museum is also participating in this year's Edinburgh International Science Festival at the department of electrical engineering in King's College from 9th to 18th April. The "hands-on" show will include a working 30-line television demonstration, a mock-up of a Fifties studio, working models and vintage equipment including a Fultograph picture transmitter and receiver, a "meatsafe" microphone and "state-of-the-art" items from the college experimental laboratories.

For further information ring Harry Matthews on 0506 824507 or Dorothy Brankin on 0506 823424. Details of the Science Festival can be had by ringing 031-556 6446.

The museum, which is run by a charitable trust, always needs helpers, like guides, restorers, researchers, catalogue-compilers and someone to operate their AM1250 offset litho printing machine which is idle. Ring David Brown on 0506 826638.

Another Scottish show of interest will be "Radio Times" at the Tullie House Museum, Carlisle from 3rd April until 25th July which will include displays of vintage receivers.

Roger Snelling

Members will be sad to hear of the death of Roger Snelling who was a very early member of the Society. He served for some time as Technical Officer and also Industrial Liaison Officer.

Roger was a model member, being willing to help in all sorts of ways, including running meetings and writing articles for the Bulletin. He worked for Marconi and was happy to share his extensive technical and historical knowledge. A keen collector, he was also good at authentic restoration but his seriousness of purpose was always tempered by a genuine friendliness and a bubbling wit.

Our sympathy and good wishes go to his wife Margaret, who was always at meetings with Roger.

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In passing

> Continued from page 1

Joshua Sieger

We are also sorry to hear of the death of Joshua Sieger, whose name will be familiar to readers of wireless magazines of the Twenties.

Born in 1907, he was an early wireless enthusiast, and made his first coherer set as a boy to receive spark signals in 1917. At the age of 17 he got a £4 a week job on "Amateur Wireless" which he held for many years designing and making a new set for publication every week and running a workshop which gave a service to readers by curing the faults in their homebuilt sets. His most illustrious customer was the Duke of York – later King George – who sent along his homebuilt set to be checked over. Joshua also worked on large-screen mechanical televison for Scophony, and after special work in the second World War, founded a pioneer gas-detection company.

Until just before his death he had been busy working to complete his autobiography, the manuscript of which he sent me to read for him.It is hoped that an old friend of his will be able to complete it so that it can be published.

Information Officer's Report

from Dave Adams

Information: offered . . . and sought

Thank you to all of you who sent in a completed questionnaire along with your subscription renewal. It has been quite an exercise but an infinitely worthwhile one. We shall not have to repeat it. We shall be inviting new members to complete one when they enrol. Thank you to those of you who added a note or letter. Your comments and suggestions are most welcome.

Here are its findings:

Eighty per cent of us 'collect'. It is appreciated that a collection can be anything from a pile of junk in the attic (like mine) to a large (expensive) classic one. Half of us specialise to some degree but I think we are all happy to make acquisitions of items that take our fancy for other reasons. We were disappointed that fifty per cent did not tell us whether you would want your name and address published but this may have been due to the cramped layout of the form. Of those who did answer, some forty per cent said 'yes'. These names I have added to my register of members' interests. We shall publish these extra names in due course. We cannot say when we may be able to publish a full list again. Meanwhile please ask me if you are seeking a fellow enthusiast.

Now, the part that interests your Editor – the voting for subjects of articles in the 'Bulletin'. The top three were: wireless history 79%, technical matters 77%, restoration techniques 75%. The next two were: history of particular manufacturers 60% and valve history 55%. Those scoring less than fifty per cent were: history of broadcasting 46%, cabinet design 40%, early TV 37%, foreign radio and biographies tied at 33% and last came military radio 21%. With regard to this last one I can't help thinking that if the question had been asked, say, forty years ago, in the happy days of cheap government surplus, it would have headed the list! You could then have got a battered, R1155 for £2.50! Ah!, happy days, or would have been if I'd had the money.

Now I am going to be asking for help.

I am seeking any information on Burndept and Amplion in their early days, up to, say, 1928. (They both entered a new phase about this time.) I would be grateful for anything. At this stage I am asking only for you to tell me if you think you can help. I do, of course, have the articles in our 'Bulletin' and a good number of adverts.

Another request is for recordings of Lord Haw Haw. Does anyone know if any exist?

I am trying to find out about pre-war trade magazines, other than 'Trader' and 'Broadcaster'. I have fragments of, and have come across references to, others. If you have any such please let me know.

Recently I have acquired a copy of Mullard's "Valves for Commercial Receivers 1931/1936". It gives the valve line-up's of some 2,000 sets but, more importantly it lists nearly two hundred manufacturers, cross referred to brand name. It presumably lists all the models each firm made during the 1931-1936 period. Were there any other issues of this booklet of earlier or later dates?

Now I am going to ask for ideas. Several members have asked for help to increase their technical knowledge. (I think that if we had asked a question on this it would have revealed this as a more general need.) I am guessing that only a minority of our members had any formal training and/or professional experience. I, and others, have ideas but I would be pleased to receive suggestions or offers of help. We are always mindful that many of our members are geographically remote. Good progress is being made in the organising of swapmeets elsewhere than Harpenden and I think it is possible to do the same for training sessions and seminars. SOS for help.

There is one other, not unrelated, matter and that is the helping of new members to learn of the vintage wireless 'scene'. I do send out, to any enquirers, leaflets of other organisations as well as our own. I do not see any of them as competitors and I do not think they do either. But I think there must be new members who find they have only slowly learned of all aspects of the hobby. I would like to hear from new members on this. Perhaps a regular 'For New Members' feature in the 'Bulletin' is required – and also, perhaps, one 'For Technical Beginners'? I look forward to hearing from you.

Here is a suggestion that has come from more than one member and that is – it is, perhaps, time to begin to give attention to post-war sets. One compelling reason for some is that the pre-war ones are becoming too expensive. Another reason, one of my own this time, is that the 'time will come' when these are in demand. I have already begun to collect service data of this period.

Referring back now to my previous report when I made a request for indexes, I am pleased to report the receipt of two valuable lists. One is a comprehensive list of military equipment and another of the relevant handbooks, both of WWII. I can supply copies – large SAE and two first class stamps, please.

Has anyone else any indexes or lists or anything that will enrich the Society archives and so improve our information service?

Dave Adams, Information Officer, 69 Silver Lane, West Wickham, Kent BR4 0RX. Tel: 081-776 1531.

Editor's Note: From this survey it seems that we have the "mix" of subjects reflected in the Bulletin about right, although, as with all surveys, the questions asked to some extent determine the answers received and it was a sample rather than 100% of membership, so we cannot be certain to have covered all interests. As always, we are responsive to suggestions and criticisms and would especially welcome concrete help in the way of contributions on all subjects!

Broadcasting in 1914

by Pat Leggatt

How did the Belgians do it?

In 1914 before World War I, a station at Laeken in Belgium broadcast a regular programme of speech and music every Saturday afternoon. The transmissions started in March 1914 and continued until German troops crossed the Belgian frontier later that year, at which time the station was dismantled.

This pre-dated the Dutch 'Hague Concerts' by five years and the American KDKA by six; although the Americans may still lay claim to be the first regular broadcasters in the shape of the San Jose (California) station SJN, an arc- based operation of 1909. But now returning to Belgium, some interesting technical questions come to mind.

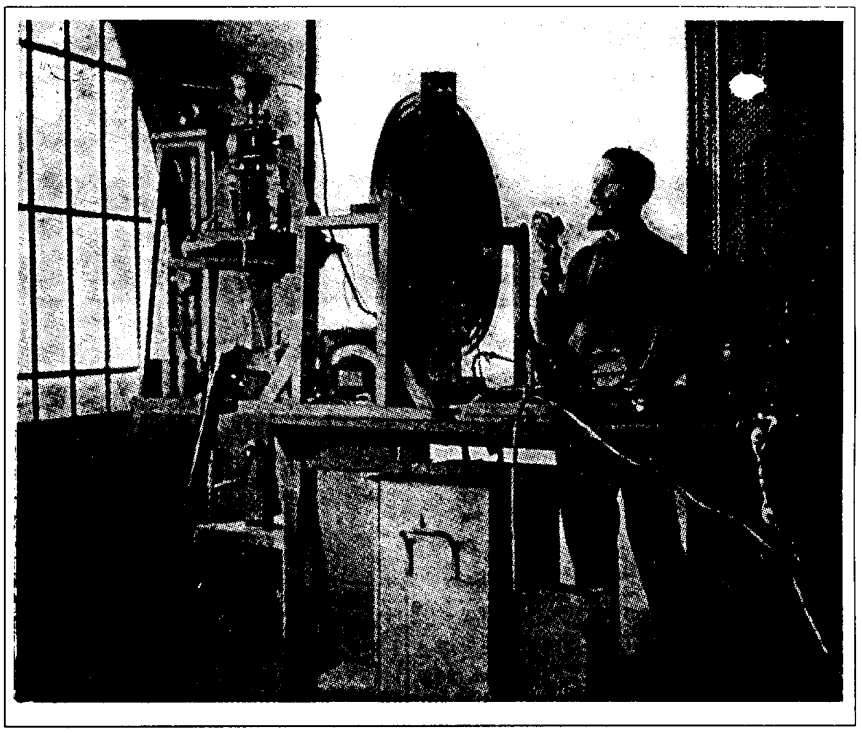


Figure 9 – Laeken (Brussels) station of Robert Goldschmidt, showing Moretti arc and Marzi microphone.

Form of Transmitter

One may wonder what sort of transmitter was used. For tolerable transmission of speech and music a continuous wave (CW) carrier is needed, rather than the discontinuous damped wavetrains of standard spark transmitters. Although the amplifying and oscillating capabilities of the Audion valve had been discovered in 1912/13, it seems unlikely that valves were available for the Laeken transmitter, This leaves three possibilities: an arc system; a high-frequency alternator: or a synchronous spark arrangement wherein the spark repetition rate was high (perhaps 10kHz) and spark timing was such that each wavetrain was phased to give a coherent series of oscillations, hardly distinguishable from true CW.(Fig.l)

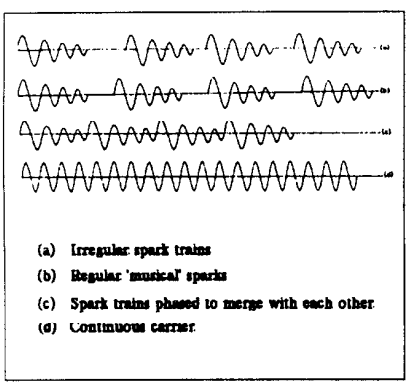


Fig. 1

In March 1914 the Belgian Robert Goldschmidt communicated by radio-telephony from Laeken to Paris. Since the Goldschmidt high-frequency alternator is Famous, on might think that the Laeken transmitter was based on this; except for the fact that the alternator inventor was the German Rudolph Goldschmidt rather than Robert. Furthermore, in April 1926 Popular Wireless magazine said of the Laeken transmitter that "The main oscillating circuit was dependent on the behaviour of a film of electrified water flowing over a copper cylinder". PW was never a model of technical clarity and their brief description seems obscure: but they did indeed have some basis for referring to electrified water for in fact the Moretti spark gap was employed. This device had been used in Italy by Professor Vanni in 1912, when he succeeded in establishing radiotelephony between Rome and Tripoli: it comprised two copper electrodes, one hollow with a fine hole through which acidified water was continuously pumped to form a thin layer over the lower electrode. A spark between the electrodes vaporised some water into steam and immediately quenched the spark, so that each spark produced only a few cycles of fairly undamped oscillation in the aerial tuned circuit. The spark repetition frequency was very high (above audibility) and an accurate sub-multiple of the aerial resonant frequency; and each wavetrain was properly phased to take up where its predecessor left off.

Modulating the Transmitter

Given a reasonable approach to a continuous wave carrier in the aerial, the next question is how this was modulated by microphone signals: again it is assumed that no valve amplifier was available to Laeken in 1914.

In very low-power telephony transmitters, modulation was effected simply by including a carbon microphone in the aerial/earth circuit: varying resistance of the microphone would of course produce corresponding variations in aerial current. There was however a difficulty in that the small range of microphone resistance variation gave only a very limited percentage modulation of the RF carrier. So it was sometimes the practice to include up to eight microphones in series to give reasonable resistance variation, the eight microphones being coupled by tubing to a single mouthpiece.

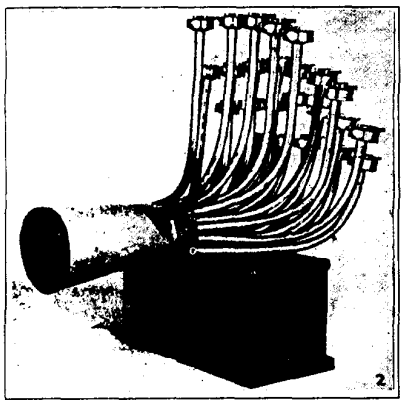
For higher-power transmitters, such as that at Laeken whose signals could be heard in Paris, the problems were greater in that aerial currents of 15-20 amps could be encountered, far

Historical research

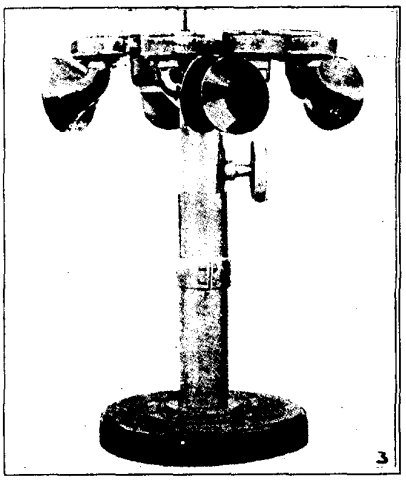
more than a typical small carbon microphone could withstand. There were two lines of attack on this; a high-power microphone capable of carrying such currents, or a normal small microphone followed by a power amplifier.

High-Power Microphones

A fairly unsophisticated approach was to connect twenty or more small carbon microphones in parallel, fed by tubing from a common mouthpiece. (Fig. 2). A difficulty lay in ensuring that all twenty were



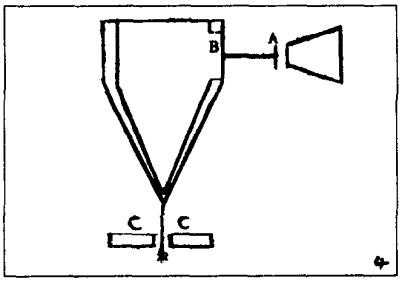
equally affected by the incident sound, but Goldschmidt devised a magnetic auto-balancing system to overcome this. A variation on the multi-microphone theme was that of Ditcham who mounted four paralleled pairs of microphones on a rotatable stand, so that a fresh cool pair could be brought round into circuit every two minutes when the one in use had got too hot. (Fig. 3).



Single microphones capable of handling about 15 amps of aerial current were developed in the first years of the century. Fessenden in 1906 produced a substantial carbon microphone with water cooling; and a condenser microphone for connection across the transmitter tuned circuit. The latter produced frequency modulation of course, but this was converted to AM by tuning slightly off the aerial resonant frequency so that the frequency excursions traversed a portion of the steep skirt of the aerial response curve.

J. Berliner, in Vienna, designed an air cooled microphone with an integral motor-driven fan; not ideal from the point of view of background noise one would imagine!

In 1902 Blondel developed a flame microphone in which the diaphragm varied the pressure of gas feeding a flame between two spark electrodes. The resulting varying ionisation in the gap encouraged or inhibited sparking.

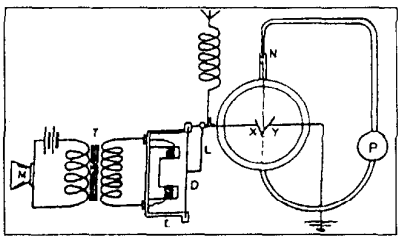


Lastly must be mentioned the water (hydraulic) microphones, of which the Italian Majorana's version is quite well known. Here the microphone diaphragm ('A' coupled to the elastic membrane 'B' in Fig. 4) varied the pressure in a water reservoir from which a thin stream emerged underneath. The stream fell between two electrodes 'C' and the resistance between them varied with the density of the stream as modulated by the microphone diaphragm vibrations. This device was capable of carrying 12 amps.

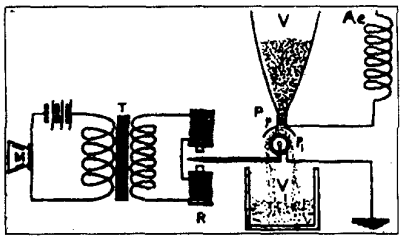
Microphone Relays

In the earlier 1900's the term 'relay' was used to indicate what we would now call an amplifier. The electro-magnetic switch that we think of as a 'relay' can of course often constitute a power amplifier wherein a small current controls a larger one.

It was fairly common practice to use a small carbon microphone to energise an electro-magnet with associated steel diaphragm, on the lines of a moving iron earphone or loudspeaker. With this arrangement a small microphone could be coupled to the Blondel flame system as a microphone relay (power amplifier), or to Majorana's water device. Professor Vanni designed a similar water system as a microphone relay and used it in his Rome-Tripoli transmissions. In Fig.5 the relay diaphragm 'D' moves electrode 'X' and alters the resistance of the water-filled gap between 'X' and the fixed electrode 'Y'.



Kuhn (of Telefunken) and Alexanderson (of American G.E.Co.) both developed magnetic relays. In these the transmitter oscillations were passed to the aerial via an iron-cored transformer – feasible with contemporary radio frequencies of only a few tens of kilohertz. Signal currents from a carbon microphone were fed to a control winding on the transformer, which varied the permeability of the iron core and hence the impedance in the aerial circuit. Alexanderson's 'magnetic modulator' could handle 75 kilowatts.



We ought now to get back to the 1914 Belgian transmitter. Popular Wireless seems rather obscure on the modulation question also, saying "the modulating circuit made use of powdered carbon which was made to flow between two carbon points".

However this can be positively identified as the microphone relay invented by the Italian Marzi, similar in principle to the water microphones but with carbon dust in place of water.

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Broadcasting in 1914

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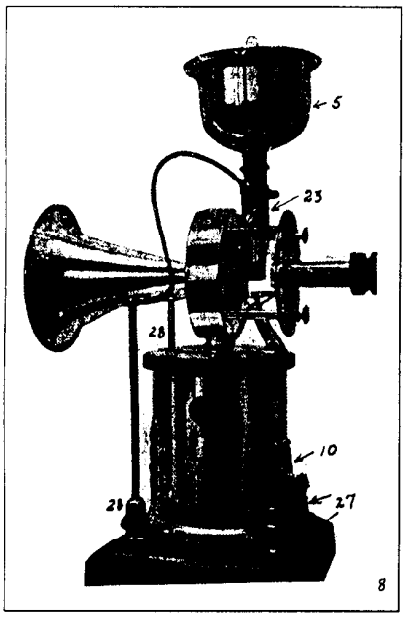
A small carbon microphone operated an electro-magnet with associated steel lever armature: the far end of the lever was attached to one of a pair of electrodes, the other electrode being fixed. Carbon powder flowed from a reservoir down over the electrodes, the resistance in the gap depending on the instantaneous position of the moving electrode and hence varying with the microphone signals. The variable resistance gap was connected in series with the transmitter aerial.



The used powder fell into a lower container Fig.8); and in the original form of the device there had to be intervals in the speech while the operator transferred the contents back into the upper reservoir. However Popular Wireless tells us that at Laeken the used powder was "automatically" returned to the reservoir for re-use as soon as it had cooled down. This sounds a bit complex and, knowing PW, I take it with a pinch of – carbon powder. It could be more likely that a refilled instrument was substituted while the powder in the first was being transferred.

Conclusion

So there we have it: sparks, steam and scrapings from burnt toast, and Figure 9 shows Robert Goldschmidt in the midst of it all. Rather different from today, but a fine Belgian achievement all the same.

Acknowledgement
I have derived much useful information from Bob Paquette's article on Early Microphone History in the American Antique Wireless Association Review Volume 4.

Second World War equipment

John Brown and his SOE radios

A tribute to a man whose wartime work, which saved many lives, has been largely unsung, due to its secrecy.

By Pat Hawker

The recent death of John Brown, a 75-year-old Scot, long resident among the Sassenachs, has taken from us a man who wore modestly his important role in the wartime development of "suitcase" radio transmitter-receivers for paramilitary and clandestine radio links. Today, his 50-year-old radios are eagerly collected for private and public museums, and on occasions still heard on the amateur HF bands.

He was sometimes known as "Mr B-2" in recognition of his most successful suitcase radio – the Type 3 Mk II which became available in 1943, with some 7000 produced at an SOE "factory" at Stonebridge Park, north-west London. The Type 3 sets were those intended primarily for links of over 500 miles and commonly designated "B" models, to distinguish them from the lower power Type 21 ("A-series") for use over ranges of up to 500 miles.

From 1940-46 he proved to be "the right man in the right place" – a professional radio engineer at Station IX (The Frythe, Welwyn) of the Special Operations Executive, one of whose cover names was the Inter-Services Research Bureau (ISRB). But although, in no small part due to John Brown, SOE was to emerge as a highly successful player in the complex and, for the secret radio-agents, highly dangerous business of running radio links between the UK, North Africa and later Italy to and from German-occupied territory, the early days were difficult and contentious, with radio close to the heart of the bad blood between SOE and British Intelligence (MI-6/SIS) and between SOE and de Gaulle's BCRA intelligence and sabotage agency.

John Brown, from a tender age, was intensely interested in radio, and in the 1930s trained at the Regent Street Poly. As a young man, he worked for Premier Radio which supplied components, short-wave kits

John Brown as a young SOE officer

and by 1939 was marketing the "5 v 5" low-cost communication receiver covering 12-2000m in five bands at a cost of £8 8s 0d, thus rivalling the Hallicrafters "Sky Buddy". Called up into the Royal Corps of Signals, after volunteering for the RAF, he was swept into the world of secret radio soon after the formation of SOE with its Churchillian remit of "setting Europe ablaze".

SOE from its formation in July 1940 (following the fall of France) was – and remained until it was stood down in 1946 – deeply enmeshed in dispute with the long-established Secret/ Special Intelligence Service (SIS/MI-6).

In 1938, in recognition that war with Nazi Germany was approaching, SIS had established not only a radio section (Section VIII) under Old Etonian [Sir] Richard Gambier-Parry, former Sales Manager of Philco (GB) and one-time BBC Public Relations, but also a new Section D, under Major L. Grand, for irregular warfare including sabotage. On the outbreak of war Section D soon became active in the Balkans, including an abortive plan to block the Danube in order to cut the supply of Romanian oil to Hitler's armies.

Section D and the SIS outposts relied on Section VIII for radio communications. Section VIII's wartime headquarters were at Whaddon Hall, near Bletchley. Its responsibilities soon included the handling of diplomatic traffic for the Foreign Office, setting up transmitters

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Second World War equipment

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for "black broadcasting", the establishment of a new HF system for distributing ULTRA intelligence information (derived largely from intercepts of German Enigma messages) and later the main part of the Radio Security Service. The Nazi invasion of Norway, Denmark, Belgium, Holland and France in the Spring of 1940 presented Section VIII with the challenge of re-establishing radio links with those who could provide secret intelligence or help military evaders and civilians reach the UK, an activity that became the responsibility of Section I (IS9 which post-war became known as MI-9). Despite the inherent dangers of radio, it became a vital part of Intelligence and Escape activities and the organization of Underground Resistance.

With the unexpected loss of Section D and the appearance of an organisation not under their own control, MI-6 moved quickly to claim that all clandestine radio links with the continent must be run by them (an exception was made for the Poles and Czechs who largely ran their own radio operations). A special training and operational station was established at Grendon Underwood with potential agents for SIS/SOE/BCRA etc trained by Section VIII staff in the use of equipment virtually hand-made at Whaddon, for which demand soon far outstripped supply.

The equipment at Grendon included Whaddon Mark III transmitters (6V6-807). This was a relatively heavy transmitter not designed for parachute droppings or easy portability. With a 1-v-1 "straight" (regenerative detector) receiver, it formed one of the first "suitcase" equipments smuggled into the unoccupied zone of south France via Portugal and Spain. A much lighter but unsophisticated early transmitter-receiver was the compact Mark VII, with 6V6 crystal-controlled power oscillator providing about 5 watts of RF between 3 and 8 MHz and a 0-v-1 receiver using two 6SK7 octal-base valves, initially in a wooden box, but later as VII/B in a compact metal container. This model became known as the Paraset and was widely used until the liberation of France in 1944.

Grendon Underwood with its simmering rivalries between staff and students, many of whom were politically opposed to others from the same country, and its limited supply of relatively unsophisticated radios, was something of a shambles. SOE were soon seeking a divorce from Section VIII.

Not surprisingly, the early SOE and BCRA agents after reaching France found it difficult and hazardous to establish reliable radio contact with the UK. Increasingly, SOE sought (as, unsuccessfully, did BCRA) to gain control of their own links – and in 1941 began to develop their own radio equipment at The Frythe, where John Brown was soon writing critical assessments of the Whaddon equipment. He also examined and tested the Polish equipment designed by Tadeusz Heftman at the Polish workshops at Stanmore which he much admired and drew inspiration from, recognising them as the best clandestine radios then available.

It was not until July 1942 that SOE was officially authorized to set up its own Signals Directorate to run its own wireless affairs; to make and operate its own equipment; to train its own operators; and to be responsible for its own ciphers. But well before then, The Frythe was actively anticipating the decision. Captain Bert Lane, designed the 350Hz S-phone, first tested by F/Lt Charles Bovill on October 6th 1941.

By autumn 1941, John Brown had designed his first suitcase set – the Type 3 Mark 1 (B-1) intended for links over 500 miles. The receiver was a four-valve, seven-stage reflexed superhet (ECH35-EF39-EBC33 EF39) essentially designed for Morse reception. It covered 3.8 to 15.8MHz with an IF of 470kHz and with the EF39 IF amplifier doubling also as an AF amplifier.

The transmitter with 400 volts HT provided an output of about 12-18 watts from a single 6L6G as a tritet crystal-controlled power oscillator, the tritet arrangement permitting harmonic operation. John told me that he drew on the "Runt 60" transmitter design in QST, September 1939, but with his own special contri-bution in the form of a pi-network tuned anode circuit suitable for matching to a wide variety of simple aerials.

The B-1 was manufactured by Marconi, initially at Writtle and then at Hackbridge, and a considerable number ended up being sent to Russia for use by their partisans.

SOE Signals possessed a talent not always obvious in the rival Intelligence camp: an ability to listen carefully to what its agents in the field told them, and to appoint one of their first successful radio-agents (Georges Begue, MC aka George Noble) as the F Section Signals Officer. And on 10 May 1941, Captain Pierre Julitte, a professional French radio engineer, was sent from London on behalf of de Gaulle's BCRA to investigate the severe problems surrounding the early radio links. In March 1942, he returned to London with "Remy" (an outstanding BCRA intelligence agent whose real name was Gilbert Renault-Roulier) who formed the CND group in the Paris area and established successful radio links with the MI-6 control station (Signal Plans Columbine and Harlequin) using locally recruited French radio operators.

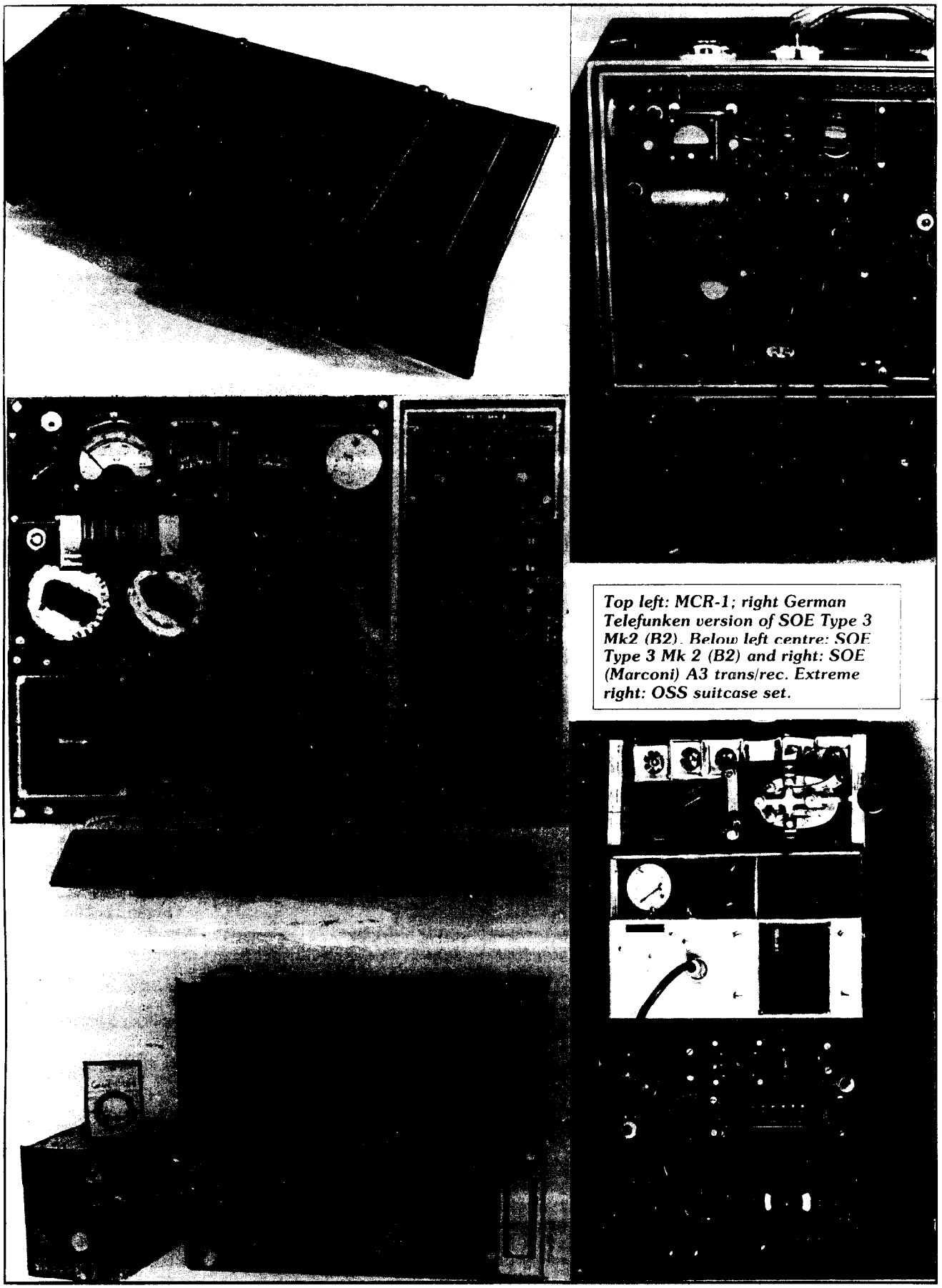
Julitte on his return prepared a detailed report highly critical of many aspects of the SOE/BCRA radio links as controlled by Section VIII, both operational practices and equipment. Of conditions in the occupied zone, he wrote: "In some districts if a set requiring more power than the Paraset is used on the mains, other electric lights on the same circuit tend to vary in brilliance with the keying of the set . . . supply meters are carefully watched to locate any increase in consumption. In Paris particularly, the German D/F organisation is very elaborate and complete. If a new call appears on the air they get D/F bearings from fixed stations within 30 minutes. There are 24 local D/F groups around Paris, where apparatus and vans are kept ready for instant use. It is practically impossible to use transmitters in Paris without being detected by D/F.

"In unoccupied France persons seen carrying suitcases or parcels are subject to 'black market' searches. It is however dangerous to carry a Mark III suitcase, and care must still be exercised when operating from the mains."

Julitte considered the Whaddon Mark III unsuitable for use in the Occupied Zone on the grounds that it was too large; too powerful; required too much power from the mains; and caused loud 'key-clicks' in nearby broadcast receivers. The Morse key, he claimed, was mechanically noisy and the indicator (pilot) bulb too bright. He believed the Paraset was better, but too large (sic) for use in Paris, although sufficiently powerful to work 'London' successfully from any part of France and had been used regularly in Marseilles.

He considered it more satisfactory to use commercial all-wave receivers with special additions such as a beat-frequency oscillator for CW (Morse) reception, bandspread tuning etc "a small adapter using a crystal-controlled 6V6 is then plugged in and removed after use". He reported that

Second World War equipment



Top left: MCR-1; right German Telefunken version of SOE Type 3 Mk2 (B2). Below left centre: SOE Type 3 Mk 2 (B2) and right: SOE (Marconi) A3 trans/rec. Extreme right: OSS suitcase set.

Second World War equipment

equipment had been made in France that looked like ordinary receivers, but easily changed over for transmission. Adapters ("Lincoln") and transmitters concealed in broadcast receivers were soon available from Section VIII and such "transmitting" receivers were also made, for their own use, by the London Poles.

John Brown turned his attention to Type 21 (A-series) models for shorter range, resulting by August 1942 in the Mark II (A-2) suitcase set, soon modified as the A-2* when American loctal valves became available. The A2* introduced in October 1942 in three metal containers, comprised a 3V superhet receiver (with reaction) covering 3-9MHz using 7Q7-7H7-7H7 valves, the single-valve transmitter comprised either a TT11 or 7C7 loctal valve, providing an output of some 5 watts. It could be operated from the mains or from 6V accumulators by means of a vibrator unit. Again, this model was manufactured by Marconi, who in 1943 re-engineered John Brown's A2* into the compact A Mark III (A-3) which was roughly the same size as the Whaddon Mark VII/Paraset but far more sophisticated. Some 4000 were built as a single unit, 8.5 by 7.5 by 3 inches, with an all-up weight of some 9lb, less than half that of the A-2.

Full information on the A-2 was also supplied to the American OSS whose first suitcase set had proved unsatisfactory. Features of the A-2 were copied by OSS and led directly to their SSTR-I suitcase sets, their standard covert radio.

The A-3 was a true "transceiver" since the 7H7 crystal-oscillator of the two-stage 5-watt transmitter (7C5 power amplifier) doubled as an the audio amplifier for the 3.2 to 9MHz superhet receiver with 1215kHz IF (7Q7-7H7-7H7-7H7 plus the 7H7 transmitter valve). Bridge-type metal rectifiers eliminated the need for a rectifier valve. A-3 sets were well- suited for use over the relatively short paths to Northern France.

Concurrently, John Brown was designing and overseeing the production of the B-2, generally regarded as the most reliable suitcase set for longer ranges or for paramilitary operations. The 7000 B-2's were used in many countries and theatres of operation, not only by SOE's agents but also, for example, by the Jedburgh teams that dropped into France in uniform and by the "Phantoms" (General Headquarters Liaison Regiment). There is every reason to believe that it was with a B-2 that a Phantom's Signal Officer maintained for the first few days a link with the UK from Arnhem when the standard Army sets failed lamentably. For several days the only radio links with the Arnhem forces were via the Phantom B-2 and a BBC link using Army Sets 76/R109.

My first experience of the B-2 was at Nijmegen in November 1944 when I got mixed up for several weeks with Airey Neave's IS9 escape and evader unit (Hugh Fraser as second in command was at Nijmegen). IS9's own radio operator was equipped with a B-2, an MCRI and also an Army No 19 set. My equipment included a Whaddon Mark III, HRO receiver and an 150-watt ONAN petrol-electric generator – a reliable but far from portable set-up! Using the B-2 on the Special Forces network, with its continuous watch on a special 5MHz frequency, proved an interesting experience! But it showed me how, by 1944, SOE had created and were running a highly effective radio system. IS9 at the time, was busy mounting the ill-fated Pegasus 2 operation, to bring back more survivors from Arnhem – unfortunately far less successful than the earlier Pegasus 1 mounted from Eindhoven – but that's another story.

The B-2 retained several of the features of John's B-1 but used the more rugged loctal valves and a two stage transmitter (EL32-6L6G) providing some 20 watts RF output, again with a flexible pi-network tank circuit. The three metal containers included a flexible mains power supply unit that could be switched instantly to operation from accumulators, a valuable feature for covert operation in view of the German Funkabwehr/ORPO practice of pinpointing clandestine trans-mitters in apartment blocks by selectively switching off electricity supplies until the transmitter went off the air.

John was also responsible for the MCR-1 (Type 36 Mark I) a miniature battery-operated communications receiver with plug-in coil assemblies. Some 10,000 were made for SOE by Philco (GB) and many were used in occupied countries for reception of the cryptic messages broadcast by the BBC ("iodoforms") from Bush House. The four plug-in coil assemblies covered 150-1600kHz, 2.5-4MHz, 4-8MHz and 8-15.5MHz. The IF was 1730kHz and the receiver measured 3.5 by 2 by 8.5-inches with separate 67.5/1.5V layer battery carrier. Valve line-up IR5, IT4 (local osc.), 1T4, 1T4, 1T4. Weight of the receiver about 2lb and often delivered in Huntley-Palmer biscuit tins, complete with coil units, batteries etc. A number are still in working order.

He was always much interested in questions relating to power supplies for use in the field and the problem of keeping batteries charged. Pierre Lorain has pointed out that SOE made use of seven types of battery chargers: conventional mains units; hand- and pedal-generators, including generators that could be fixed to the back wheel of stationary bicycles; thermo-electric 1A chargers using arrays of about 350 chromium- constantan cells in a fireproof brazier heated by a wood or charcoal fire; wind generators on collapsible 10ft poles; petrol-electric generators similar to the "Tiny Tim"; and a steam generator with a boiler suspended over a brazier with a flexible tube to a small steam engine (total weight about 70lb) which could charge a 6V battery at about 4A.

After the secret war had ended, Sir Colin McV Gubbins, SOE's final executive director (CD), stated that without the covert radio links "we would have been groping in the dark". John Brown was outstanding as one of the band of talented team that primed and lit those lamps.

After the war, as a professional radio engineer and from 1948 as a keen radio amateur (G3EUR), he worked for Courtaulds in Coventry, moving back to London with Decca Navigator, and then in 1954 founding Aveley Electronics.

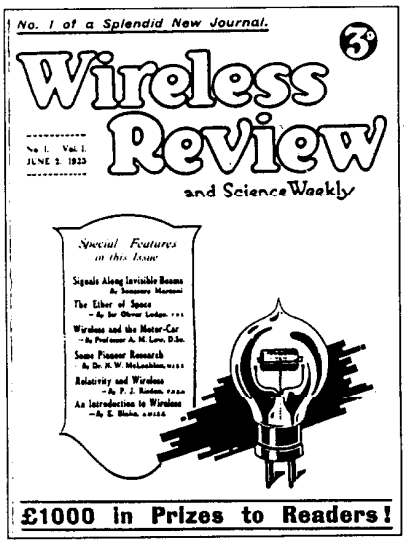
John never lost interest and a modest pride in his wartime work and those who had used his sets. He was an active member of the Special Forces Club, Knightsbridge and the Royal Signals Amateur Radio Society, and most recently also president of the Duxford Radio Society associated with the Imperial War Museum.

He once expressed to me the feeling that the work of the radio operators, usually of NCO rank, was frequently glossed over in the Mission reports drawn up by the commissioned officers who, as Organisers, led the secret missions. Similarly he felt that some of the younger "military historians", who in recent years have often been highly critical of SOE, fail to recognise the problems that faced the organisation in wartime or to understand the atmosphere in which it worked – not least the need that arose to create an entirely new form of military communications technology at a time when miniaturisation was virtually unknown and valves were still bulky and fragile. Although my own allegiance was to Section VIII(W) and not to SOE I gladly pay tribute to John and the remarkable work he did for SOE.

The mystery of the "AnoDyne"

by Robert Hawes

In "Wireless Review" of June 2nd, 1923, the front page of which is reproduced here, there appeared first news of a remarkable new thermionic valve which was described in the Editorial article as "a unique and quite revolutionary development in high-power amplifiers". Unique it certainly was, for nothing like it had ever been seen before nor has been since. Revolutionary it was too, in more ways than one. But what is also remarkable is that it seems to have disappeared as suddenly as it appeared. The valve was called the "AnoDyne" and few collectors appear to have even heard of it.


No. 1 of a Splendid New Journal.

3d

Wireless Review and Science Weekly

No. 1. Vol. 1. JUNE 2. 1923

Special Features in this Issue

Signals Along Invisible Beams

The Ether of Space

Wireless and the Motor-Car

Some Pioneer Research

Relativity and Wireless

An Introduction to Wireless

£1000 in Prizes to Readers!

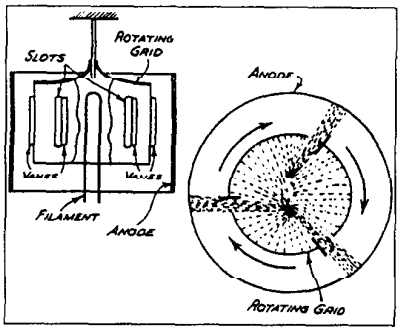
They were fond of fancy names in the 'twenties, especially ones which seemed to have a scientific or academic ring about them. The name "AnoDyne" is a good example. Based on the Greek "Anode" and "Dyne", the term was probably intended to conjure up the idea of a valve with a little dynamo inside. But what exactly was the AnoDyne valve?

To answer that question is impossible, for no proper description of the device ever seems to have been given. The "Wireless Review" article is simply a eulogy and gives only a vague idea of what the valve was supposed to do. And the advertisement for it in the same issue, placed by a small firm which was better known for its valve-repair service than for the design of valves, makes modest and fairly ordinary claims for the product. Even the outline specification for the patent application obscures more than it reveals, for it is largely incomprehensible. The valve does not seem to have mentioned in any of the authoritative sources of its day, nor even another popular wireless journal save the short-lived "Wireless Review". But let us begin with the report in that particular journal - a few short paragraphs in the "Science Jottings" feature, a rag-bag of news items, written in a chatty, journalistic style: the kind of "appetizer" one might expect to see in a new paper aimed at a mass-market of not particularly knowledgable readers. The item gives no real information but makes suggestions which must surely have given rise to surprise if not scepticism among the more knowledgable readers. The article begins with the simple explanation: "In the normal valve, the electrons thrown off by the heated filament pass through the grid and re attracted to the anode..." and continues "but in the AnoDyne valve, there is a second anode, placed concentrically with the first. This second anode is caused to rotate by the action of the infra-red light from the filament upon its alternately-placed black and white vanes, and has the function of receiving impact or secondary electrons, thus greatly increasing the amplifying power of the valve". No supporting information is given to substantiate this somewhat incredible statement, and the author, perhaps to justify his position, concludes: "Naturally, the exact details of this remarkable new device are at present a closely guarded trade secret, but

Part of the "abstract for a patent application".

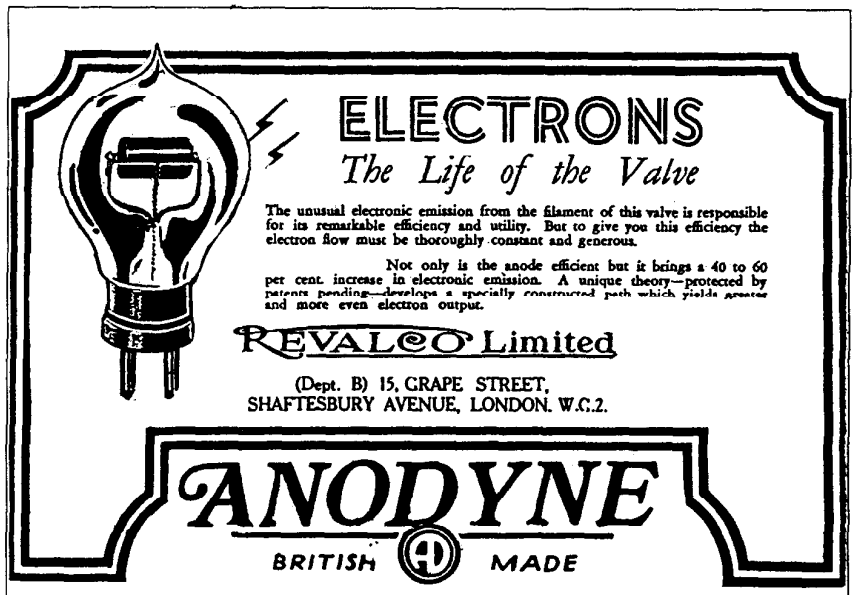
Historical research

further news of the development will be given, together with the report of a test in our own laboratory, in due course." In fact, the journal does not seem ever to have referred to the "AnoDyne" again. (Incidentally, there is also a little mystery about that particular issue of the "Wireless Review" in that in some copies of the item on the valve was omitted and replaced by a photograph with the caption "The world's largest Incandescent Lamp". The author would like to hear of any other variations. In the same issue, the advertisement for the valve seems also to have undergone changes. In the author's issue it makes the modest claim of "40 to 60 percent increase in emission" by means of "a unique theory protected by patents pending".) A search of the patent applications at around the relevant date reveals no mention of the AnoDyne, but an "abstract" which appeared in the Zeitschrift Rundfunk Geschwafel, published in Hamburg in April of the same year includes a drawing and part of the original description crediting a man called Kurz Schluss with the invention. The only credential given to him is a statement that he was "connected with the Electrical Institute of London", but this must have been an error, for no organisation of that name existed in London at that time. The drawings show something that looks remarkably like an "R" valve having the familiar horizontal electrode assembly. But in what looks like a "cut-away" view, there appears to be a kind of finned cylinder inside the conventional anode.



Actual illustration from Stanger's article.

The text of the reproduced document is barely readable, and is in any case rather incomprehensible, but it seems to suggest that this was intended to rotate within the device! Now, the notion that a rotor can be activated by light-waves within a vacuum has been known to every schoolboy since Crookes demonstrated his "Solar Engine" or more properly "Radiometer". The reason why the AnoDyne never got a patent may have a lot to do with its obvious similarity to the Radiometer. But even if the rotor anode did revolve in the Dynode, how did it double the emission of the valve? Had this elegantly simple device somehow anticipated the sophisticated electron multiplier? And just as puzzling: how did 1920's technology manage an efficient yet virtually friction-less commutator to collect the charge from the rotor? The mystery of the revolutionary Anodyne valve will not be solved until an actual example of the valve turns up somewhere: and one with an intact filament!



A contemporary advertisement.

Editor's note

"Truth is stranger than fiction"

Readers who have got this far will have realised that the foregoing is pure nonsense. I wrote it ten years ago as an April Fool's Day spoof, forging the contemporary "advertisement" and the "Patent drawings" from my imagination. The article was first published in the Society's Bulletin in 1983. Since then, I have come across some information, including diagrams, which reports that a valve with a rotating grid was proposed in the very early 'thirties - and may actually have gone into production!

The report was published in about 1931 in "Newnes Complete Wireless", whose general editor was Edward Molloy with the backing of Ralph Stranger and some distinguished contributors including Barton-Chapple.

In a section on wireless theory, Stanger reports: "There is being developed in America a valve with a rotating grid. The rotating grid is a metal cylinder with slots and vanes. The electrons from the filament are attracted by the grid and some of them pass through the slots, bombard the vanes and thus repel them so that the latter are bound to rotate, entraining the grid with them. In this manner the valve acts akin to a turbine and is referred to as an 'electronic turbine'. The anode is also a metal cylinder.

"It is claimed that the rotating grid does not interfere with the flow of electrons from the filament to the anode, and the whole arrangement will work as an ordinary three-electrode valve in a wireless receiver. This is only one of its functions. The rotating grid valve will act as a commutator, a switch, an interrupter or a converter. It is also used as an electronic motor in electric clocks. It can also be used in television. No doubt it will be developed in the near future, and the mechanically-inclined listeners will have the satisfaction of seeing "something going round" in the receiver".

I have just found another reference to the valve - a repeat of much the same information by Stanger - in Vol.3.No.1. September 1931 of "Armchair Science" the technical adviser for which was the famous Professor A.M.Low. At around the same time, Stranger included the same story in his book "Outline of Wireless" but declaring it HAD been developed in the USA. He added "At present, its practical application is rather problematical. Watch the technical journals for fresh news about this valve".

Here, the trail ends. I have found no other reference to the valve. Can our experts on vintage valves, particularly American readers add anything further ?

Illustrations from the 1932 book. Top: details of construction; below, "showing how the electrons from the filament are attracted by the grid and pass through the slots".

A Cheap AM/FM Converter

by Geoffrey Dixon-Nuttall

This device is intended to provide decent programmes on MW, as an alternative to the usual diet of drivelling pop and interviews with bored housewives. If you are lucky it will not only be inexpensive, but free! You do, however, need a source of V.H.F. programmes.

The raw material is a retired transistor portable. These can be picked up for very little, or nothing, if they have a damaged cabinet, but what we want is the front end, which is usually intact. The circuit will probably look like Fig. 1. Modify this, by any means that takes your fancy, to fig. 2. The two unmarked capacitors are 0.01μFd. The coil is tuned by about 300pF, which can usually be found as the padding capacitor, although not in the particular set.

Note that the supply may be positive or negative, according to the type of transistor used (NPN or PNP). The audio output of the V.H.F. receiver goes into the base, and the output comes from the collector. (You do need quite a lot of audio to drive it).

This with about six feet of wire on the output will carry for several feet. If you want more, wrap the output lead round your aerial. Tune the coil to a vacant spot on the band. (Not easy after dark!)

Note that if you can find an AM/FM transistor set you may be lucky enough to discover that the AM oscillator/mixer transistor is not used on V.H.F. In this case you can use this as the transmitter.

Please do *not* do this to a decent set like a Hacker or Roberts. There are quite enough cheap and nasty ones around to try it on!

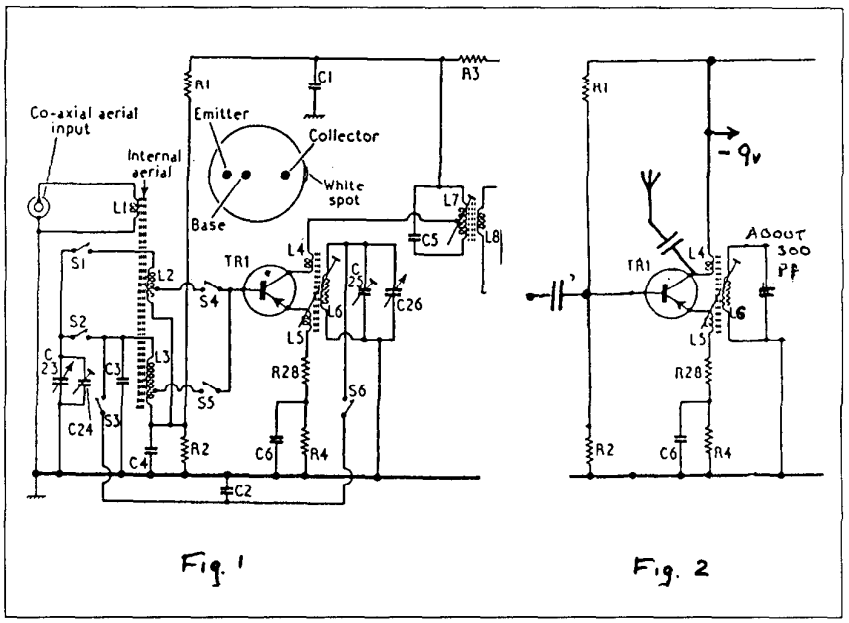
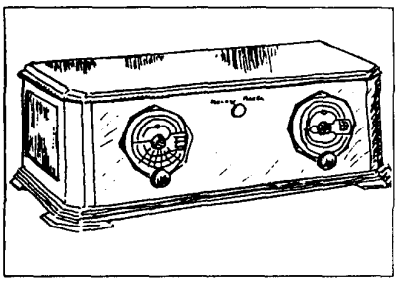
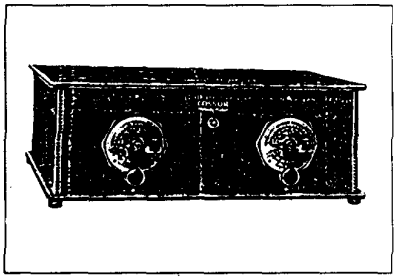


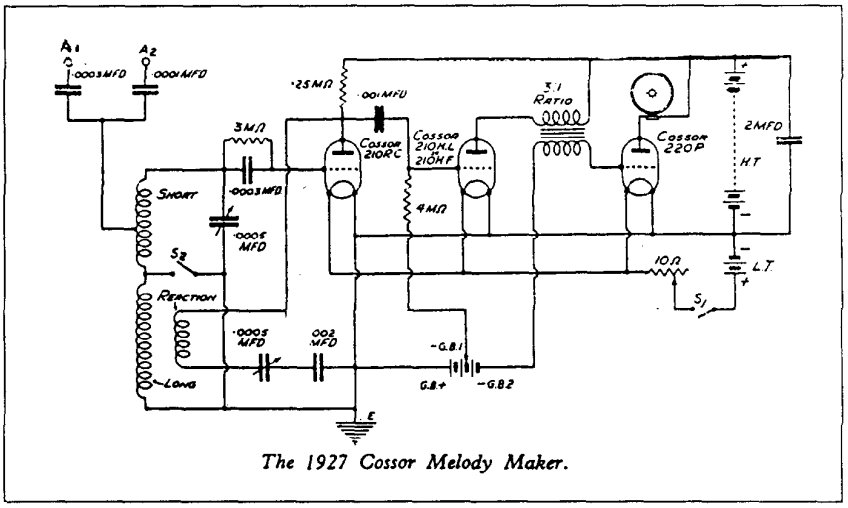
Fig. 1 Fig. 2

Following Geoffrey Dixon-Nuttall's article in our last issue It has been pointed out to me that there was an earlier "Melody Maker" than the ones illustrated.





The first apparently came out in 1927, and although it was reported in "Wireless World" at the Show they did not use the "Melody Maker" name. Here it is. The circuit is comparatively crude, and a kit was isued in 1929 to bring it up to scratch, with an R.F. stage.



The 1927 Cossor Melody Maker.

Technical history

Receiver Techniques of the 1920's

Part 6

by Pat Leggatt

Here is number 6 of a series of short articles by Pat Leggatt reviewing the circuitry and other features of wireless sets of the 1920s. Each article will outline a particular aspect of sets of this period. Back numbers of Bulletins in which earlier parts appeared can be obtained from The Editor.

Volume control

In the later twenties, as in modern times, volume control was effected by means of a high-resistance potentiometer tapping off a proportion of the audio signal. But stable high-value variable resistors were not available in the earlier 1920's and resort was had to other methods of volume control.

No such control was needed with crystal sets where the problem was always to get more volume rather than to reduce it. With valve sets reliance was usually placed on reduction of reaction, control of which in early sets was often provided by varying the coupling between pivoted plug-in anode and grid coils. Sometimes a third pivoted aerial coil gave very effective volume control, situated in just the right place at the input to the set for avoidance of overloading by very strong signals. It should be remembered that the first broadcast transmitters, although of fairly low power, were all located within the boundaries of big towns and cities so that many local residents could indeed receive signals large enough to cause overloading. Later, when the Regional Scheme offered alternative programmes from twin high power transmitters in each region, the new transmitters were sited in sparsely populated areas to avoid swamping the conurbations with such high field strengths that overloading and consequent cross-modulation would have made it difficult to separate the two programmes.

Cutting out LF stages, described in the previous section as an economy measure, provided very coarse volume control; finer control could be had by some reduction of reaction or by adjustment of filament rheostats to limit valve emission. But the latter method shortened the valve grid base without reducing the input signal amplitude, and could thus introduce appreciable distortion.

In the 1924 BTH superhet already mentioned, a volume control labelled 'Intensity' took the form of a variable capacitor across an IF transformer primary, reducing IF gain by detuning to the required degree.

In the Marconiphone NB2 'Voice Amplifier' and the V3 and V4 receivers of 1992, volume control was effected by switching various fixed resistors across LF transformer secondaries. This obviously affected frequency response and indeed the control was labelled 'Tone'. But in the owners' manuals it is referred to as 'Strength' and it is clear that volume control was the intended purpose.

In the Marconiphone Type 31 receiver of 1925 the same transformer shunting technique was used for volume control, with a continuously variable resistance rather than switched fixed values.

Negative feedback was not a feature of 1920's receivers: the invention is generally credited to the American Harold S. Black who patented it in 1937. But it appears, although probably not understood, in the 1925 Cosmos VR4 receiver in the form of a 1000pfd capacitor between anode and grid of the first LF stage. Furthermore it seems to have been stumbled on in 1926 by a reader of the English magazine *Popular Wireless* who connected a 'variable grid leak' between the secondary of an intervalve transformer and the grid of the previous valve. He found that this arrangement gave "purer reproduction and elimination of unwanted noises"; and no doubt a useful degree of volume control. What a pity he didn't patent the idea!

Correction
My thanks to Graham Dawson for pointing out an error in my last article, Part 5 in this series. The cost of a Loewe 3NF valve in today's money should of course be £50.50 rather than £10.10. Careless work with my calculator, not the Editor's typing error!

Book Review
by Rod Burman

"The History of the British Radio Valve to 1940" by K. R. Thrower, O.B.E.

Published by MMA International Ltd., ISBN 0 9520684 0 0

This new book has over 200 pages in A4 format with more than 20 black and white photographs of valves and many line drawings.

As its title suggests, it is concerned primarily with British Valve development, although the early work of De Forest, Langmuir and Lieben and Reiz, is covered in some detail.

The book is divided into 8 chapters covering topics such as the British Radio Valve Industry. Important valve developments. Diodes. Triodes. Multielectrode and special purpose valves and finally one dealing with valve construction techniques.

Each chapter has a useful reference and bibliography section and many have a summary outling the major points covered.

At the rear of the book are a number of appendices, including a very comprehensive one with brief data on the majority of British receiving valves produced up to 1940. There are also useful lists of valves, their manufacturers and equivalents and a glossary of valve terms.

Some of the less well technically qualified readers may find this book heavy going, as the information contained therein tends to be factual rather then entertaining. However, a number of interesting new facts, such as descriptions of Leo the Lion valves (made by Autoveyors) are revealed and the author has obviously gone to considerable lengths with his research. There are a few minor typographical errors and the author has issued an addendum sheet to correct these.

At 12.25 including postage and packing, (UK) from Keith. R. Thrower, at Old Cedar, 12 Wychcotes, St. Peter's Avenue, Caversham, Reading, Berks, RG4 7DA, the book is excellent value for money; one would have difficulty in obtaining such a wealth of information on British Receiving Valves from any other source.

It is certainly a publication that no collector of British Radio Valves or restorers of early (pre 1940) British Wireless sets should be without.

The Replica Contest

Gerry Wells and Pat Leggatt were given a difficult task at Harpenden on March 7th when we came to judge the entries for the Replica Contest. As everyone who saw them on show will testify, they were all of a very high standard of skill and imagination and it was by no means possible to reject any as being not up to scratch.

There were eleven entries, from six people. Fred Watts entered four, a set from a 'Wireless Magazine' design; a re-creation of the 'Saxon' receiver; a miniature 1-valver from a pre-broadcast design mainly for reception of time signals; and a crystal set from 'Wireless Construction'.

John Goldberg showed three sets, a 'BBC Official Set'; and two receivers based on cigarette card instructions, one a crystal set and the other a 2-valver.Bill Pozniak exhibited an ST400, running from an HT battery (with a nicely unobtrusive mains lead coming out at the back!)

David Butler offered a 'Popular Wireless' Unit Set.

Eric Westman showed his replica of a Gamages upright coil crystal set and a cigar-box crystal set.

Peter Brunning entered his 3-valve 'Signal Box'.

After much anxious deliberation we agreed that pride of place should go to David Butler for his splendid Unit Set. A great deal of work had obviously gone into it, and the workmanship was of a very high order. The final appearance was most striking, with brass bus-bars linking the various units together. The only small doubt in our minds was that it might have been appropriate to tone down the 'newness' of these bus-bars in some way.

Choosing the runner-up was just as difficult, but eventually we settled on Fred Watts' pre-broadcast I-valver. This was a very imaginative thing to have produced and of very individual appearance. Again we had just one small reservation in that we were not sure that the flat-topped screw terminals on the side of the set really matched what appeared to be dished-topped items in the accompanying illustration: but the photo-copied picture was not very clear so we may not have been right in this.

In view of their success, the winner and runner-up will perhaps not mind having minor comments expressed. For the other entries a few small points may be worth mentioning, not attributed to individuals. One entry was spoilt by rather unbelievably flashy dials and wrong type of coil holder. In another the wrong coils were installed, whereas the ones illustrated are not hard to obtain. In another the coils were not a matched pair. One entry, though excellently done, was significantly different from the accompanying illustration.

So finally congratulations to David Butler who was awarded the first prize of a copy of Robert Hawes' book 'Radio Art'; and to runner-up Fred Watts who received a copy of 'The Setmakers'. Congratulations too to the other entrants and exhibitors who were given a copy of 'The BBC: 70 Years of Broadcasting' in recognition of their very high-quality contributions.

— Gerry Wells and Pat Leggatt

Letter

from Ray Kelly, Editor of "Stay Tuned", NSW Australia

The Blattnerphone

I was very interested to read your report on the BBC Show and to hear that you have a surviving Blattnerphone in England. We also have a machine here in Melbourne. Ours is a later model than yours, however, I believe 1937. It has been restored to working order with Jim Butterworth's help, and is now in our new Science Museum, called Scienceworks. When I read your letter to me I rang Geoff Holden, the curator, and he was interested to hear that there is another working one in existence.

His machine was used by the CBC last year, to discover what was on their Marconi Stille reels. Considering the small number of these machines that were made, the survival rate of two (?) is quite good.

Editor's Note: see article on the Blattnerphone elsewhere in this issue.

Letter

from W. Stokes (New Zealand)

Getters

In Ian McWhirter's letter (Feedback Vol. 17, No. 4) on the subject of valve gettering, reference was made to a Met Vick type DEll which had a white coating of magnesium oxide on the pinch, the purpose of which was to prevent any evaporated nickel settling on the pinch during firing and causing a leakage path.

Mr McWhirter is quite correct in stating that the DEll illustrated on p.197 of my 70 Years of Radio Tubes and Valves shows evidence of being hardened with a magnesium flash, but I would be interested to know why the magnesium oxide coating he mentions was applied low down on the stem, well away from the lead-out wires. Surely to be effective for the purpose this coating should have been placed where it would do the most good, i.e. on the top edge of the pinch where the leadout wires are sealed through the glass.

Incidentally, it can be seen by examination that many Mazda valves of the 1930s had a white coating on the top edge of the pinch which appears to have been applied for the same reason. It would be interesting to know whether this substance had the same chemical composition as that used in the case of the DEll. Perhaps Mr McWhirter can enlighten us.

Letter

from Richard Cole,
The Musical Museum,
368, High Street,
Brentwood, TW8 OBD.

Help sought

Can anyone design me a fairly simple sinewave generator? I want to try to devise a unit that will replace the old electrostatic tone generator in a 1936 Compton Cinema Organ. The original engraved discs have distorted and degraded beyond repair.

The unit needs to be able to produce 73 notes of the musical scale, starting at the C below middle C (approx. 128 Hz). It needs to be polyphonic, and if possible (though not essential) for each note to be tunable separately. It could use 12 top-note generators, and the use frequency dividers for the remainder? Rates of attack and decay need to be variable too.

Feedback

Letter

from B. Land

Cowboys – or honest Injuns?

In the matter of repairs to our vintage receivers,, I am becoming more and more resentful of the snootiness implicit in the comments of some of your contributors who refer to "cowboys". Apparently the *only permissible way* to repair a set is by using parts identical to the original; failing that, a modern component such as an electrolytic capacitor must be hidden inside the old.

Apart from the occasional special set which one might want to conserve as a museum exhibit, this strikes me as either daftness or deception – or both. During the normal working life of our sets, what would the average repair-man have done? Would he really invariably consult the manufacturer's parts-list for the number of a burnt-out 10K resistor, and post off an order for it? Or would he just pull one out of his current stock, and get the set working again more quickly and just as effectively? Or if the mains-transformer had failed, and the maker no longer held stocks, would he not, quite reasonably, fit a Radiospares universal?

In my view the history of a receiver as evidenced in the repairs done to it is part of its character. I think of my sets not as showroom exhibits but as tough survivors of fifty or sixty years of use and abuse, care and neglect. I am not a curator but a conserver, and in most cases I would consider it quite legitimate to do to a set whatever a good 'thirties radio engineer would have done. I regard it as perfectly satisfactory to replace a VP4B with an AC/VP2. To get it working (which is the most-important thing) I recently replaced all the paper capacitors in a Wartime Civilian set with polyester ones which I had to hand – and I make no apology for doing so. Does that make me a cowboy?

I would argue quite strongly that it is those who hide a silicon diode under the vanes of a metal rectifier, and pretend it isn't there, who are really the cowboys . Now that our vintage radios have (unfortunately) become marketable commodities attracting commercial interest, the use of such techniques to disguise repairs, if not disclosed, should in the event of a sale be viewed as fraudulent.

It is more proper to the spirit of preservation for us latter-day servicemen to do whatever would have been acceptable to our forebears, than attempt to re-create an original artefact. We are after all dealing not with unique Michaelangelo but with mass-produced domestic appliances. Even so, recent restoration of the paintings in the Sistine chapel was done so as to make the repairs obvious. What is so wrong in replacing a braided mains lead with a PVC one? At least it's honest. Trying to pretend that every AD65 still extant is fresh off the production-line isn't.

Letter

from: R.E. George

Loomis

I was looking through my large encyclopedia* when I chanced upon:

"Loomis, Mahlon 1826-86, American inventor, pioneer in wireless communication; practiced dentistry in Washington, D.C. In 1866 he sent signals through space between two mountains in West Virginia, using aerials carried by kites. He was granted a patent on 30 July 1872. In 1873 the Loomis Aerial Telegraph Co. was incorporated by act of Congress, but without any appropriation. As Loomis failed to secure financial support elsewhere, the project fell through."

If the extract is correct, Loomis anticipated Marconi by 29 years !

Is it possible to find out technical details such as the means of generating energy for transmission, and what kind of detector was employed ?

* The Columbia Encyclopedia, Columbia University Press 1935.

Comment from: Pat Leggatt:

Dr. Loomis was a Washington D.C. dentist. He was of any inventive turn of mind and took out patents on plates for artificial teeth, a convertible valise (convertible to what, I wonder), cuff and collar fastenings, an electrical thermostat and telegraphy.

In the 1860's he became interested in the possibility of wireless communication, and set up a system wherein two kites on copper wires were flown on adjacent mountain tops some 18 miles apart. The 'transmitter' kite wire became charged by atmospheric electricity and, when discharged to earth with a key, set up a current pulse in the 'receiving' wire which was registered by a galvanometer. He demonstrated his system to members of Congress in 1868, attributing the effect to 'atmospheric conduction'. He was granted U.S. Patent No. 129971 on July 30th 1872, for "establishing an electric current for telegraphic or other purposes without the aid of wires, batteries or cables".

As Mr. George says in his letter, Loomis failed to secure sufficient financial support - first due to a Boston stock market crash in 1869 and two years later a disastrous fire in Chicago which ruined his supporters - and his ideas came to naught. Nevertheless Loomis, like his contemporary David Hughes, must be given credit for anticipating the work of Hertz and Marconi to some degree, even though he did not understand the principles underlying his experiments.

The above notes reflect Tony Hopwood's 1980 article in BVWS Bulletin Vol.5. No.1, and Eric Westman's 1988 letter in Vol.13 No.2.

Letter

from George Mechan

First, an appreciation of the "Marconi Cavalcade", which I think is most splendid, and I was surprised to see Lloyd George using a "mike" in 1923, however, being just 8 years old at the time, my only memories are of a hatred for crystal-sets!

Regarding the article on "condenser droppers", I do recall coming across a commercial chassis with this arrangement, which could have been under the "Philco" label, and of early post-war date. I find the arrangement works well with a small transistor, made for 110v mains.

Regarding R. G. Christian's letter, there is surely no argument about the use of the words "condenser" or "capacitor", for in the early times it was the Dubilier Condenser Co and Telegraph Condenser Co. Let us all stick to the original cycle of names, and there will be no need of any hertz!