

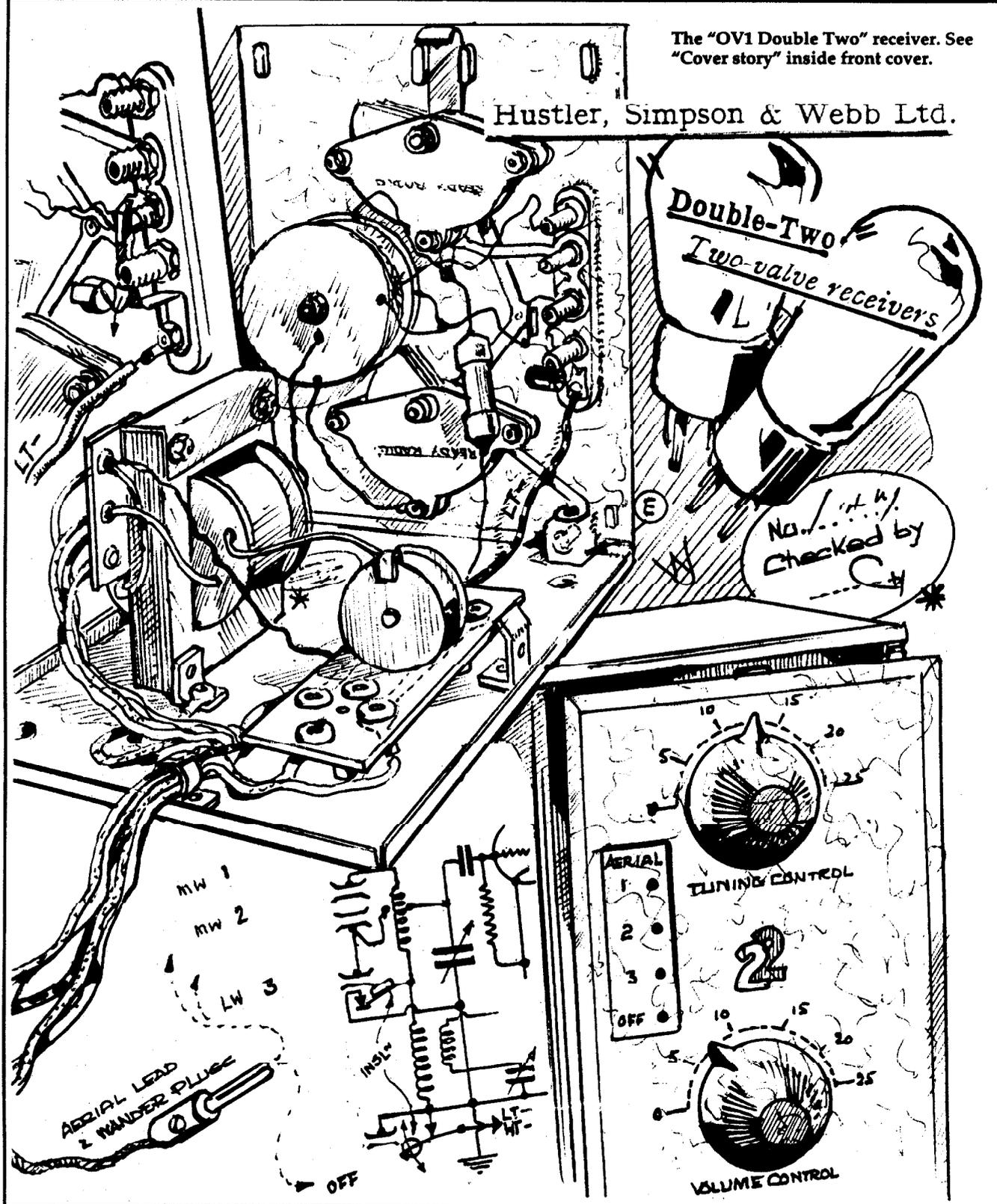
BULLETIN OF THE BRITISH

VINTAGE WIRELESS

SOCIETY

The "OV1 Double Two" receiver. See "Cover story" inside front cover.

Hustler, Simpson & Webb Ltd.



**BULLETIN OF THE BRITISH
VINTAGE WIRELESS SOCIETY**

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Cover Story:



Norman Jackson's drawing on the front cover illustrates the "OV1" receiver made by Hustler, Simpson and Webb in about 1930. It is notable for its beautifully moulded bakelite front panel and knobs. The switching system is novel: one plug (the aerial) cuts off the LT and HT supplies and earths the aerial itself when inserted into the socket marked "off". Pushed into the no. 3 hole, it introduces the long-wave coil, and in positions 1 and 2 it provides medium-wave reception. The tuning coil is of the utmost crudity and so is the transformer (although not quite as crude as those very early ones made by winding wire round a bunch of nails!). Norman wonders if the OV1 set was a "giveaway", as were several other cheap sets of the Thirties which were "promotional" items. The OV1 has a strange "Double 2" logo on the front which is very like one used by a shirt manufacturer that specialised in men's shirts which were supplied with two replaceable collars. Is there such a connection between set and shirt? The OV1 has some resemblance to the BTH VR2 of 1928 which also had a bakelite front and which used a "two-in-one" valve containing two separate electrode assemblies but employing a common filament. Is it possible that the OV1 set was designed to use two of the "two-in-one" valves and that this explains the "Double 2" logo? Your observations are invited.

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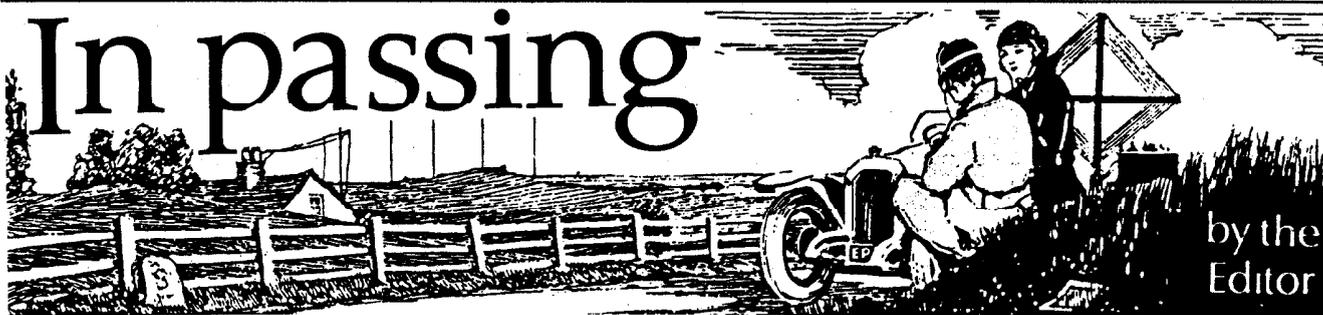
RADIOCRAFT
'FIRST WITH THE FINEST'

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.

Exhibition - meeting

Members will have an opportunity to see the unique Weston McVitie valve collection at a discussion meeting to be arranged by Keith Thrower at the Science Museum annexe, South Kensington in November. There are about 1,500 items in the collection including some very rare ones. Participants will also be able to see items from the museum collection too, including receivers. Members willing to give short talks on any wireless subject at the meeting are invited to put their names forward. Those wishing to take part should return their application forms without delay.

Talks

BVWS member Ralph Barrett, who is well-known for his lectures and demonstrations on wireless subjects, has a busy programme of events ahead which will be of interest to members. Although he takes his lecturing very seriously, Ralph is celebrated for a sense of humour and an ability to present information in a way that makes it accessible and enjoyable to everybody. He makes his own demonstration equipment, usually replicas of original experimental pieces.

As part of the programme of Faraday events at the Science Museum, he is giving a free 45-minute demonstration-lecture there at 12.30 and 2.30 on Sunday 25th August to which members are invited - it is suitable for children aged over eight too.

Ralph will also be lecturing on Faraday later in the year, as follows: 9th Oct. IEE South. 7pm, Fairfield Halls, Barclay Road, Croydon; 5th Nov. (6.30) and 26th Nov. (7pm) IEE NW at The Travellers Rest, Kenton Road, Harrow; 12th Nov. University of Surrey, Guildford 7.30 (small admission charge):

His engagements for 1992 include a demonstration-lecture on David Hughes at 5pm on 18th May under the auspices of the IEE at Savoy Place, London; and a one on "Hertz and the

Centenary of Radio Waves" on 6th. Feb. at 7.30pm. at the International Science Festival, Royal Museum of Scotland, Chambers Street, Edinburgh.

Society members are invited to all the meetings. There is no entrance fee to the IEE meetings; and free coffee and sandwiches are provided before and after the lectures.

Giveaways

Out Bulletin artist Norman Jackson is researching sets that were given away as promotional items or as gifts in exchange for coupons and would be glad to hear from any members who have helpful information so that he can prepare some drawings for the Bulletin. A well known example is the KB "Kitten" two valver which could be obtained by collecting coupons from cigarette packets - it was necessary to smoke 5,000 cigarettes to obtain one. Other giveaway sets were

the "Riviera Two", the "Double-Two" illustrated on our cover, and the "Silverstone Two". An earlier promotional item is thought to have been a crystal-set from a cereal manufacturer. Do you know of any others?

Wireless on tour

Flying the flag for the BVWS in the midlands is Chris Price of Fillongley near Coventry, who regularly takes his wireless collection round country fairs and libraries, often using his vintage vehicle, to give talks and demonstrations.

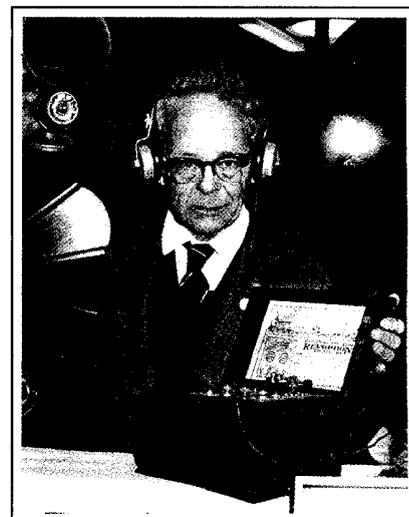


Photo: Nuneaton Evening Telegraph.

He is pictured here at a recent "Heyday of Wireless" show he put on at Nuneaton Library, which consisted of equipment dating back to 1895, which he has been collecting since boyhood. His shows attract a good deal of interest from old and young.

A note on Marconi

A new Italian banknote has been issued featuring a picture of Marconi and early wireless equipment including aerial installations on land and on ships. Enrico Tedeschi, who

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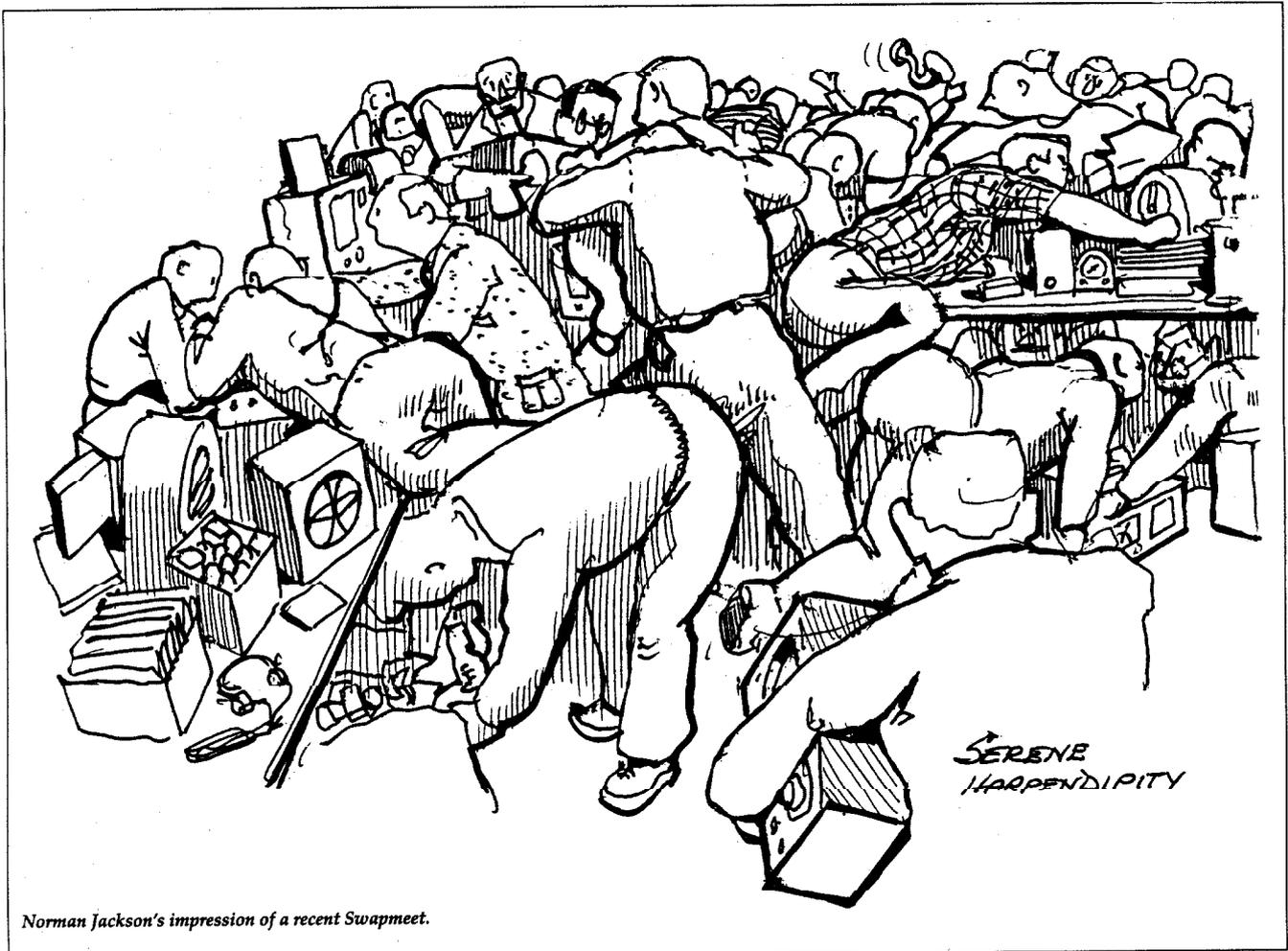
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In Passing



Norman Jackson's impression of a recent Swapmeet.

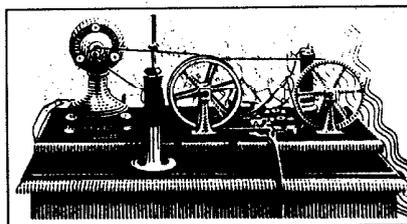


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sent us the illustration, indicates that there has been a heated polemic about the magnetic detector depicted: was it made by Marconi? We should be pleased to hear from any reader who has any information.

New Index

A revised Index to all Bulletins to date is now available, price £3, from Pat



Leggatt, Garretts Farm, Pankridge Street, Crondall, Farnham, Surrey, GU10 5QU.

Dates to note

The next Society meeting at Harpenden will be on 6th October and members requiring table space should make application before the deadline and be prepared to share. Our next meeting at Southborough, near Tunbridge Wells, will be on 8th September and details can be obtained from the organiser John Howes, 11 Crendon Park, Southborough, Kent TN4 0BE (tel: 0892 540022). Admission to all meetings is by ticket only, obtained on advance.

Battery boxes

The Society is considering reproducing one or two colourful vintage battery cases: HT, LT and Grid Bias, few of which have survived since they were expendable items. Enthusiasts who have constructed power-supply units might like to house these in such boxes, which would look good in displays. We should like to know what members think of the idea and especially would like to borrow attractive originals to reproduce.

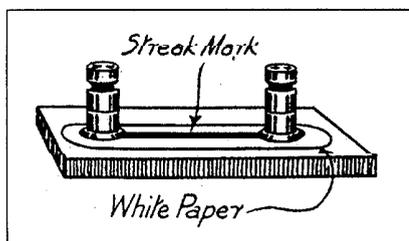
Early Technology

Done any bogging lately?

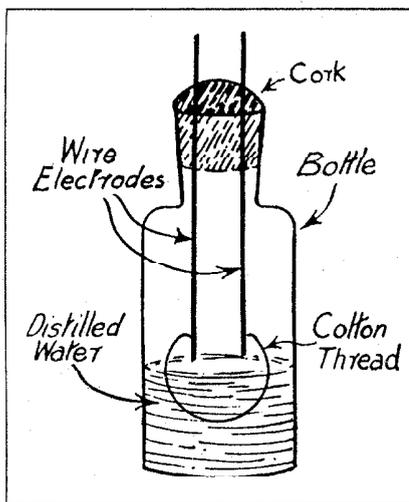
by Pat Leggatt

Perhaps my mind is unduly susceptible – it does seem to be getting a bit shaky as the years go by – but every so often I find myself bogging at some titbit in old wireless magazines and the like. Popular Wireless is a fruitful source of things that makes you say “Just fancy, I’d never have thought of that!”

Take grid leaks for example. In early days it was not easy to get reliable, fizz-free resistors of a megohm or two, particularly if you wanted to follow the then current thought that a variable grid leak would enable you to find the magic value which would really bring your detector to life. Popular Wireless of April 17th 1926 came to our aid with several useful ways to crack the problem, starting of course with the traditional lead pencil line on a strip of paper.



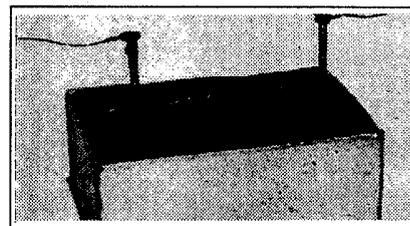
Warming to their theme, they describe another type “which may appeal to the amateur” in the form of a glass bottle containing a loop of cotton thread dipping into distilled water.



Our artist Norman Jackson's idea of an early amateur experimenter's brutwaves. Sharp-eyed readers will spot the birdcage aerial; the tuner consisting of a bag of iron filings moving within a coil; the flame-detector employing a cigarette lighter and whisker; and the oil-dielectric tuner in the form of a foot-bath and electrodes. The function of the man's bicycle clips in the shape of Hertz resonators is obscure.

The resistance value is to be varied by altering the length of thread and the degree to which it is immersed in the water. The theory seems a little obscure since it is emphasised that the water must be distilled, which you'd think would make it non-conductive. But if the resistance was too high you could add just a drop of vinegar, they say.

A very practical grid leak, it is suggested, is a wooden box filled with a mixture of sand and soot, with two small electrodes pushed in.



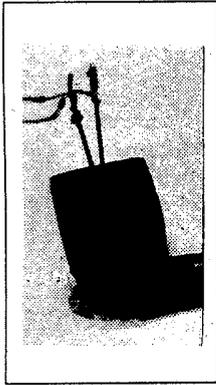
The resistance can be controlled by altering the relative proportions of sand and soot; but a good starting point would be one part of “good soot” (none of your low quality stuff) to twelve parts of sand.

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Early Technology

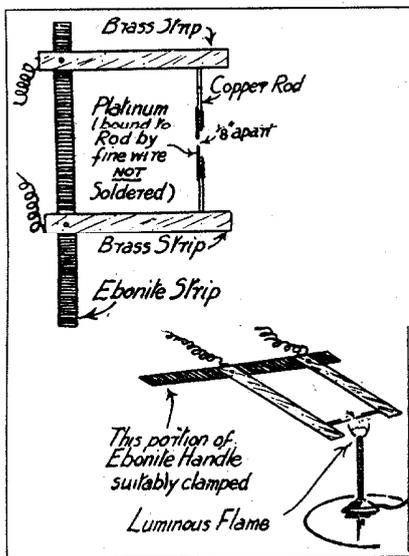
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Another interesting form, which any smoking members will want to try, consists of two wires thrust into "the uncleaned bowl of a foul tobacco pipe".



PW acknowledges that this grid leak cannot be relied upon because conditions in the pipe can never be constant (how much do you dribble?) "but it will not fail to be of interest to every valve-set owner".

A very handy grid leak can be had by supporting two platinum wires about 1/8" apart in the flame of a gas burner or oil lamp. The wires must be platinum or gold to avoid oxidation in the flame, but no doubt any experimenter worthy of the name would have something suitable in his junk box!



Finally on this subject, PW tell us that a readily controllable grid leak can be made from a bar of selenium exposed to light from the valve filament. The resistance is controlled by varying the brightness with the filament rheostat.

Not only Popular Wireless itself, but also its readers and advertisers, were ready with useful tips and information. Present-day valve collectors may like to note the reader's letter of

May 8th 1926 describing how he made a battery eliminator with "half-way" rectification provided by an old Philips valve. He remarks that "It is good to find a use for the bright-emitters most of us have by us."

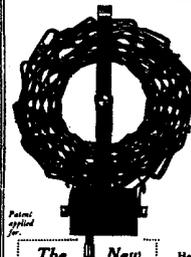
In the same issue there is a note of encouragement for those of us who find that things we build never work as well as we would have hoped. We are told that "It is a peculiar fact that many people are very sensitive at the approach of a thunderstorm, or any other atmospheric disturbance, and it is noticeable that in tuning a wireless set which is affected by body capacity these people have considerably more effect than a normal person. They find that hand capacity almost ruins their reception, whilst the set is liable to burst into oscillation even when they pass the instrument." So that's what has been my trouble all these years!

Going back to gas flames, and leaving PW for a minute, Metropolitan Vickers had ideas for a microphone on these lines in early 1922 when they were evolving plans for a broadcasting service before the formation of the BBC. In an internal memorandum they describe how they focused light from an acetylene flame onto a selenium cell. Sound vibrations impinging on the flame caused it to fluctuate so that the resistance of the cell varied accordingly. The sound, they report, was "of exceedingly good quality" only marred by a very strong background of noise arising from draughts in the room. The technique was therefore abandoned, although I would have thought the problem could have been easily solved by a notice to performers saying "Please do not breathe while the red light is on".

Returning to Popular Wireless, some of their reviews of new apparatus have a fairly high boggle index. On November 15th 1924 they report on "Sillery's Magnetic Invention for Wireless Crystal Sets", an assembly of metal loops to be strung on your aerial wire. The manufacturer is quoted as claiming "an improvement of 60-100% under all heads and no batteries required. The human voice with all its varied inflections is faithfully and naturally reproduced; there is also an absence of hardness of jargon. The magnetic influence is not only permanent but increasing." Weren't they clever, those old chaps!

On rather comparable lines are advertisements for "The Wonderful

Can you discover the reason?



The new "Mars" Coil, first advertised for the first time, is technically 25% more efficient than any other coil known.

The use of Mars triple-conductor wire and a novel method of winding, account for this superiority.

But the experts who have proved this claim report something much more extraordinary for which they cannot suggest a reason—aurally the "Mars" Coil is at least 75% better than any other. And infinitely more musical.

The New MARS COIL

Still supreme—the MARS AERIAL

National Physical Laboratory
"Mars" Aerial Wire: Resistance per meter 17 ohms
7/22s. Aerial Wire: Resistance per meter 17 ohms—twice of the ten-fold superiority of the M.A.S.

The "Mars" Aerial consists of 44 turns of triple-conductor wire, spirally wound. The whole secret is in the spiral-wire. There are many multi-strand aeriels on the market; often labeled "Mars" or "P.C."—designed to all adjust to the successful "Mars" Aerial Wire but they lack the "Mars" essential factor—the patented, inimitable spiral wire.

The price of the "Mars" is still the same—10/- for 100 ft. But the "Mars" gives ten times better results.

Here then is an invention which will vastly enhance the pleasure of non-expert listeners, command the enthusiasm of the expert and provide a problem for the theorist. The illustration of the "Mars" coil suggests its most extraordinary feature which being about 25% more efficient and 75% more musical than any other coil, concentrates the beam of the super low-loss coil. Compare the "Mars" Coil, test it thoroughly and you will endorse the opinion of the many experts who have adopted it. It is by far the most efficient and musical. Now on sale at leading wireless depots. NOTE: Those who prefer to use coil light any way will appreciate "Mars" Coil Wire, its easy to handle, flexible as string yet admirably rigid when made up. And it has the patented spiral spin and triple-conductor feature which make a world of difference. Obtainable in standard sizes—100 ft. and 200 ft. with the extra. Full particulars of the "Mars" specialties may be obtained, free, on request to: E. & W. G. MAKINSON LTD., (Printers and Advertisers) Wellington Works, PRESTON. Who will supply the "Mars" practice by post if unobtainable from local dealer. But please enquire locally before writing to us.

Mars Coil". On September 5th 1925 it is said that this coil "is 25% more efficient than any other coil known"; and continues "But the experts who have proved this claim report something much more extraordinary for which they cannot suggest a reason – aurally the Mars coil is at least 75% better than any other and infinitely more musical. Here then is an invention which will vastly enhance the pleasure of non-expert listeners, command the enthusiasm of the expert and provide a problem for the theorist".

But the Mars theorists were evidently told to go away and make a breakthrough, for a week later on September 12th we read "It reproduces music as music, because each turn of the wire, the exact spot in which one wirecrosses another, is determined in accordance with the principles of harmonic vibrations. The purity of tone obtained with the Mars coils adds immeasurably to the pleasure of listening-in." How lucky for us present-day readers that this puzzling phenomenon was so satisfactorily explained in the end!

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Early Technology

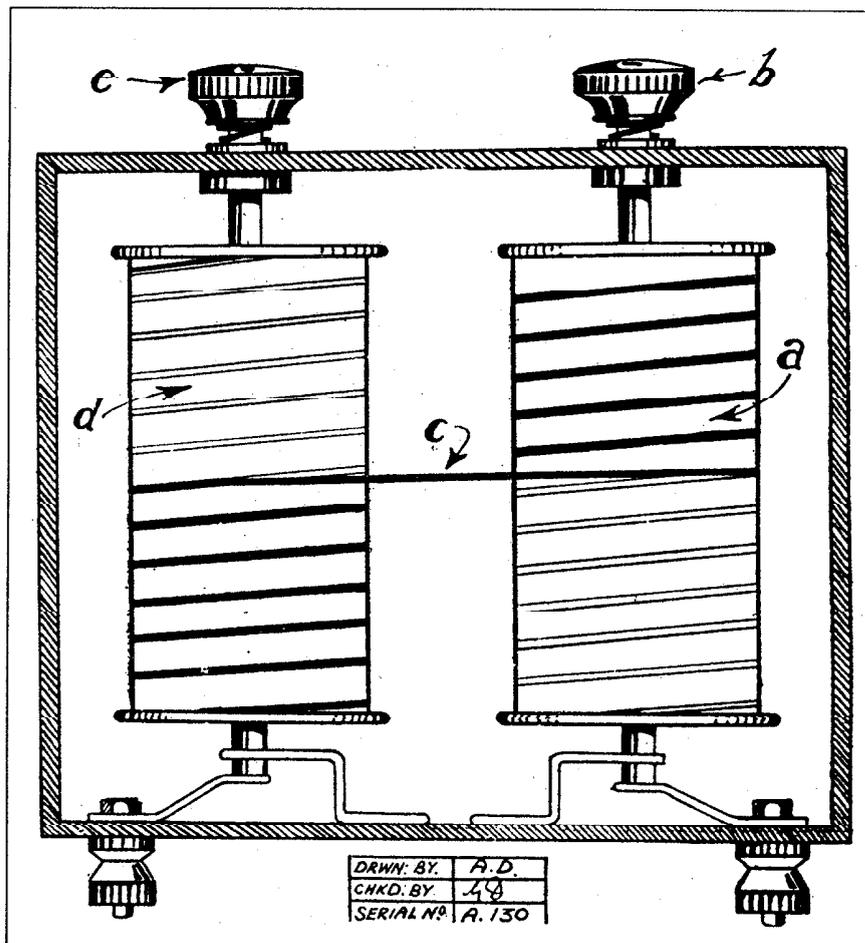
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PW was nothing if not forward-looking. In a November 1924 article on 'Controlling the Weather by Wireless' they explain how we could "drain the wind of its water vapour" by concentrating wireless waves in the right area, and conclude "In the light of present-day knowledge, therefore, there can be little doubt that practical weather control will be possible in the near future and we shall be able to order the weather very much as we please."

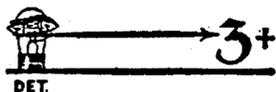
On May 1st 1926 PW ventured into bio-electronics, noting that "the human body, under normal or hypnotic conditions, is capable of setting up disturbances in the ether, and that these ether waves may be detected and amplified by ordinary means". In another issue the magazine described how an aspidistra may be used as a wireless detector, so this is evidently how Prince Charles and others talk to their plants.

PW goes on to say that it is "in some respects seemingly proved that the antennae of insects are, in reality, miniature transmitting and receiving aerials which are, in proportion to their size, many times more sensitive and efficient than an ordinary wireless aerial". Later we learn that "So far as can be seen, an insect possesses no tuning-in device. Thus each insect is only able to communicate with an insect of the same species. A beetle, for instance, is not able to pick up ether waves transmitted from the antennae of a queen bee, nor is a gnat able to tune in to the wireless radiations from a wasp's antennae." Finally the article suggests that wireless amateurs, "experimenting with a low-wave buzzer wave-meter", may be able to create ether waves which could be sensed by insects. I suppose the mind could be said to 'buggle' at all this.

To finish off before we all get too bemused, haven't you often wondered just how reaction works? Fortunately the Americans - so much more advanced technically than ourselves in the twenties - give us a proper theoretical analysis in the 1924 Crosley sales leaflet part of which is reproduced here. If we'd only known, we would have had our reaction controls calibrated in 'tube values'.



This little diagram shows three tubes using the ordinary radio frequency and detector circuit. Signals pass straight through the three tubes without extraordinary increase in their strength. The tube value therefore is 3.



But Crosley's Armstrong regenerative set, with one tube, passes the signals several times through the single tube, each time increasing their strength and giving you much more than the three-tube ordinary circuit, or a tube value of 3+.

That is why the Crosley one-tube set is so much more satisfactory and efficient.

Pictured above is a curious tuning device, illustrated in *Popular wireless* of 19th September 1925, designed by C. S. Parsons, BSc.

The gadget consists of two spirally grooved cylinders (a) of ebonite and (d) of metal, in a frame, which are rotatable by knobs (e) and (b), so that the bare inductance wire can be transferred from one to the other. Since the wire is bare, the turns remaining on the metal cylinder are short-circuited and thus the inductance of the device can be varied.

The article claimed that the instrument enabled very fine tuning and did away with the need for the use of variable condensers. In addition, it said, dead-end effects (inherent in some inductances) were avoided.

The writer reported "remarkable results" on using the instrument for tuning the aerial circuit of a crystal receiving set.

A patent was applied for but the device does not seem to have gone into production.

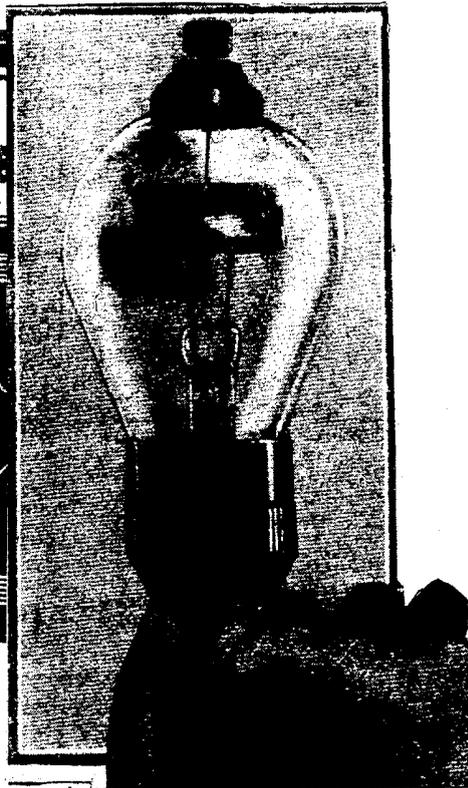
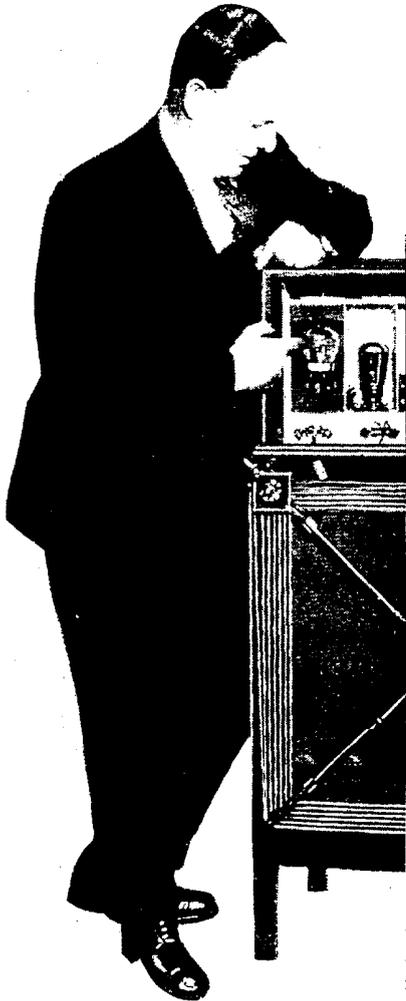
A variable condenser device, consisting of an adjustable spiral of metal strip, having some similarity to the inductance device, was, however, developed and was used in a portable receiver called the "Crystal" as late as 1957.

RH

Technical Research

Dr. Robinson and his Stenode:

A damp squib of sixty years ago
Desmond Thackeray takes a look
at inventor and invention.



The picture (left) is from Radio News, February 1931:

Dr. Robinson is pointing to the "Quartz Crystal" tube, which is located in the last stage of intermediate-frequency amplification of a regular broadcast superheterodyne. Note the loop attached to the back of the cabinet, for signal pick-up. Below, to the right, is a close-up view of the quartz crystal mounted within an evacuated tube. This crystal is ground to resonate at a frequency of about 100 kc., corresponding to the frequency of the intermediate amplifier.

[The quartz crystal sold in the USA seems to have come from "Quartz Radio Ltd., 29 George Street, London, W.1." and worked at 175 kHz. This address was a Stenode-Radiostat London office; who actually made the crystal is not acknowledged. While it was used in the American set and kits by Zeh-Bouck, Flushing, N.Y. and appears in the National Co. parts list, the crystal seems to have been omitted in British sets by R.I. and those sold by Whiteley and Selfridge, and in the Wireless Magazine homebrew design of 1934. - DPT]

Readers of wireless magazines of 1931 and thenabouts found the contents spiced by arguments about a receiver design or principle called variously "Stenode", "Radiostat", or both together (sten'odos (Gr.) "a narrow way").

The hardware combined narrow-band I-F amplification with audio equalisation, to give a broad overall response. That this stratagem was of dubious novelty can be seen from 2 ESDRAS 7:5 "If he went not through the narrow, how could he come into the broad?".

Though warmly received by some, the Stenode Radiostat proved to be of the nature of a nine-day wonder, lasting little longer than it took an official report to demolish some of the more extravagant claims advanced. For a short (and fairly sharp) account of the "STENODE STORY", turn to Barry Fox in the "New Scientist" for 26 July 1984.

His article is subtitled "The hoodwinking of the wireless world", NOT (please note) "Wireless World"; and it is certainly possible that there was some intent to overlay the virtues of the Stenode system and thereby conceal its deficiencies. However, in this world the ratio of knaves to fools seems to be less than 1:10; so I think it was more likely a case of "ignorance is bliss", the "blind leading the blind", plus a substantial element of self deception. Luckily too, there was half a century to go before the Trade Descriptions Act was due.

The full story of the Stenode brings together a number of component threads, each of considerable interest in its own right. Of major importance is the career of its inventor and protagonist Dr. James Robinson (1884-1956) who, "careering along the fast lane" in the 20's seems to have steered a disastrously wrong course. Then there is the

invention he patented of the narrow-band crystal filter for radio use; but he was only one of several to do so, and certainly not the first. And thirdly, there was the fierce argument about the "reality of sidebands" which also divided the technical world. Neither side seemed sure about the nature of reality; and the arguments had something in common with those of Tweedledum and Tweedledee. In the event, people also seemed slow to ask "exactly what is a Stenode", though Robinson's presentation was far from clear, and certainly not "crystal clear": Was he, as his qualifications imply, a clever man, but guilty of some obfuscation for one reason or another? Or was he a more average brain who was himself not clearly understanding his own creations?

We can get a little closer to understanding James Robinson the man by looking at his career. He was university educated, and had become a lecturer in Physics with an M.Sc. and Ph.D. by 1914. A glance at his published papers on the photoelectric emission from thin films of platinum suggests that his academic work was certainly of reasonable standard for PhD while not showing any of the brilliance of the great academic minds. At that point he moved quickly to a 1915 commission in the Royal Navy, was put on wireless and photography for the RAF at Biggin Hill in 1918. Here he worked on

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Technical Research

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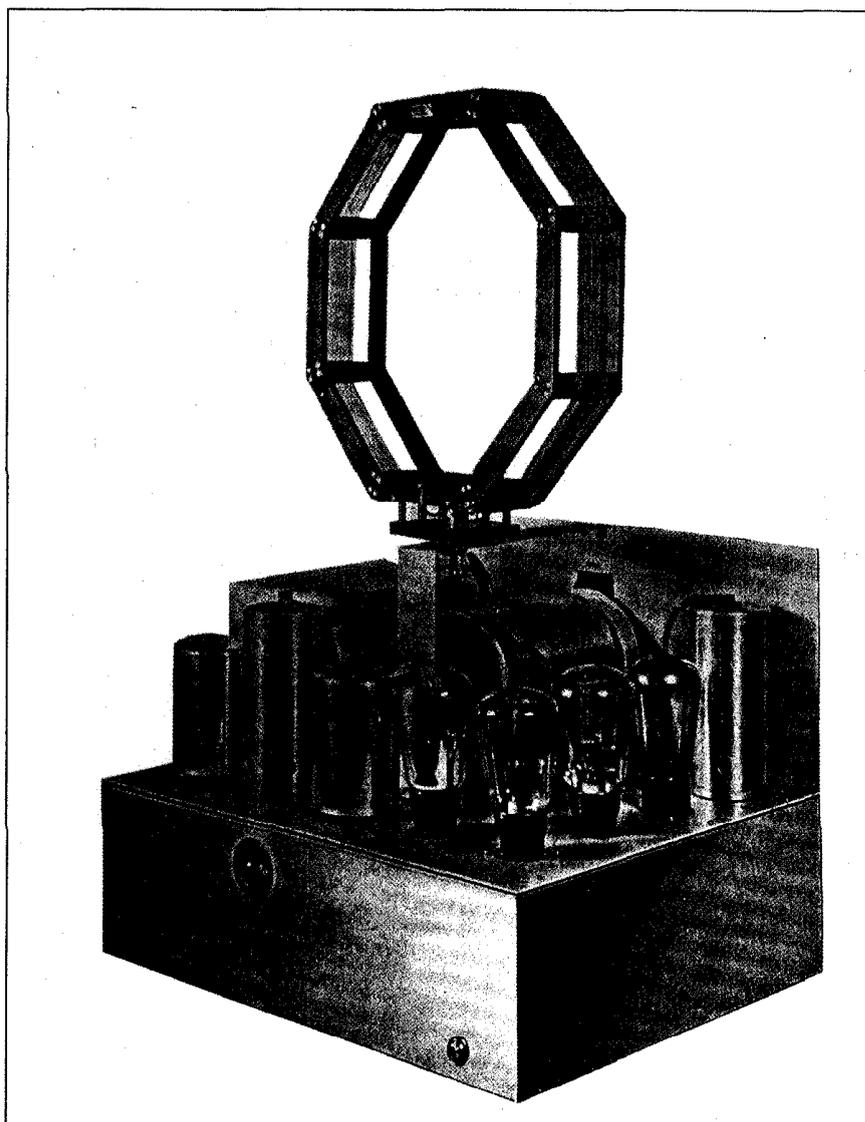
the wireless compass for aircraft until 1922 when the unit was moved to RAE, Farnborough; and there in 1925 he was Head of the Wireless Department with an additional degree in evidence, that of Doctor of Science. For what did James Robinson gain his D.Sc., a degree which usually requires both more ability and much more of the right kind of work in a single field than a PhD? Was he then really a person of very high academic calibre? And then, for reasons about which I also lack information, Robinson left his career at Farnborough in 1925 to become head of Scott-Taggart's new wireless laboratory at Elstree. Moreover, he took with him his second-in-command at RAE. So what had Scott-Taggart promised these two men, and indeed why should they have believed him? Do we have an expert of Scott-Taggart's affairs with a ready explanation?

It is interesting to ponder on the career of James Robinson had he, with experience in radio navigation and already holding down a senior position, stayed put in the Scientific Civil Service instead of accepting Scott-Taggart's pot of gold. Remember the importance of radar during the two decades following, and the promotional opportunities opening up as the service expanded, not to mention the honours and pensions earned by His Majesty's most loyal servants.

"Who Was Who" is altogether vague on the career of James Robinson, D.Sc. after 1925, merely describing him as the "Technical Adviser" to the British Radiostat Corporation. This limited company, incorporated in both Canada and the U.S.A., was obviously set up to promote the Stenode commercially; and an investigation of Company documents might well provide more information. Was Scott-Taggart personally involved? It is known that Percy Harris, another well-known figure in radio, was appointed President of the Stenode Corporation of America. But it seems unlikely that Robinson was able to lease or sell rights in any of his Stenode patents, to any company that knew its way around the radio scene.

So now, what *was* the Stenode?

A glance now at three of these British patents helps to explain what



The interior of the "Stenode Radiostat" Broadcast Receiver.

Robinson himself thought he was doing. They comprise 325, 232 of August 1928, 337,049 of July 1929, and 344,869 of Sept/Oct 1929. Now the first of the three, which phase modulates a carrier by 180°, at 20,000 times a second, is a something-for-nothing scheme, supposedly for obtaining both narrow bandwidth and fast response in radio circuits. That the world of radio design seems to have totally ignored this invention may well be an indication that it got classed along with perpetual-motion machines and the philosopher's stone. But phase-modulation is so bandwidth-hungry that it is reasonably certain that Robinson lacked clear thought at the level at which he was trying to invent. The second of these two patents is the all-important one

on the single-crystal filter for radio use, but vitiated by prior invention as I said. It was also weakened by the failure to cover a crucial parameter, that of the terminating impedance for the filter by which its selectivity may be controlled. The third of these patents, still opaque to the importance of this parameter, makes use of such a crystal filter in a receiver circuit, compensating the dramatic loss of treble by means of an audio filter. Amongst some 13 claims by Robinson is that of rejection of interference from any unwanted transmission within the audio passband of the wanted transmission. In the British patents themselves at this point in time, there is no mention of either Stenode or

• Continued over ►

Technical Research

• Continued from previous page

Radiostat as a name for any of the principles covered.

But in *Wireless World* for 11 December 1929 there is a staff report on a receiver incorporating a "Stenode Radiostat" circuit demonstrated by Dr. Robinson, which apparently gave quality reception of 2LO while rejecting an oscillator heterodyning just 1 kc/S off the carrier frequency. Patent 3 of the above group would you say? Not at all! The explanation given by Robinson seems totally at variance with this, and has more association with the material of patent 1; while the *Wireless World* writer, perhaps suspecting that the Emperor has no clothes, is honest enough to admit finding the explanation no explanation at all. One can't really be sure whether Robinson was at that time being circuitous, or was himself confused. But the confusion between patents 1 and 3 seems to continue into later articles he wrote himself for publication, which include a "1" explanation and "3" circuitry. Was one of these the Stenode and the other the Radiostat? Or were both, both?

In the event it was the third patent and its claim which divided the world of radio into those who believed Robinson, contrary to accepted views on signal bandwidth and carrier spacing, and those who didn't. So important to band-planning was a definitive answer that the Radio Research Board entered the fray, and in 1932 published their report No.12. In this report, F. M. Colebrook of the National Physical Laboratory brought together theory and experiment to show that circuits such as Robinson had published did have some advantage in minimising intelligible interference while doing nothing at all to diminish the remainder. This proved to be an ideal answer in that everybody was partially right. However, a system which is good in parts, like the curate's egg, is really only as useful as its defects allow. And the world of radio seems never to have found any lasting use for the Doctor's egg, despite commercial versions marketed by RI (*Wireless World*, 29 April 1931) and others, and attempts by Robinson to interest American companies. Robinson does seem to have continued his earlier interests with an aircraft altimeter patent in 1934. And he surfaces again in 1943 with a letter in *Wireless Engineer* in which he

Top right: the broadcast model.

Centre: The original Broadcast model.

Below: Diagram of the "Stenode Radiostat".

FRAME AERIAL

S/G H.F. AMPLIFIER

AUTODYNE DETECTOR

2 S/G I.F. STAGES

SECOND DETECTOR

CORRECTOR

2 NOTE MAGNIFYING STAGES

MOVING COIL LOUD SPEAKER

Simplified Diagram showing the arrangement of the "Stenode Radiostat" Broadcast Receiving Set.

seems to be rubbing salt in his own wounds from the mistiming of the crystal-filter patent. Presumably, Scott-Taggart's laboratory had ceased to be a viable operation by then; does any S-T buff know its history? Scott-Taggart himself was given an administrative job in radar during World War 2, which suggests to me that he was well-regarded in official quarters. But what Robinson did during the 1939-1945 period I have not discovered. Had he fallen so far from grace with the Scientific Civil Service that he stayed out in the cold; or was he

busy on some wartime task that is never spoken of? I'd welcome any information on this that readers come across; A Brit.I.R.E. obituary was silent on the matter. And has anybody come across any surviving Stenode hardware, or a quartz crystal mounted like the one in the Radio News picture?

My thanks to numerous BVWS members who have loaned or given me photocopies of relevant articles, as well as numerous tantalising snippets of information.

Wireless pioneer honoured

by Robert Hawes

More than 80 years after his death, wireless pioneer David Hughes has been honoured by the placing of one of English Heritage's famous blue plaques on the house in Great Portland Street, not far from the BBC, where he carried out his "broadcasting experiment" and devised his microphone.

The plaque was unveiled at a ceremony in mid-July, by BVWS member **Ralph Barrett**, C Eng. MIEE, who is well-known as a lecturer on wireless subjects, and for whom the ceremony was the culmination of efforts he began eight years ago to have Hughes commemorated in this way.

Performing the unveiling ceremony accompanied by Norman Howard and other members of English Heritage, Mr. Barrett said he felt Hughes was now an old friend, he had been preoccupied with researching his work for so long. He recalled that Hughes, born in London in 1831, had gone to the United States at the age of seven, where he became a Professor of Music but also became interested in all kinds of experiments, inventing a synchronous telegraph printer.

"He was self-taught and worked in this house with the enthusiasm which seemed to characterise Victorian scientists. Here, he invented the epoch-making microphone. He also invented the word 'microphone', hoping it would do for sound what the microscope did for vision".

He continued: "In this house, Hughes invented the early form of metal detector – the induction balance – used by Graham Bell to look for the bullet in Garfield's body. With his induction balance he succeeded in performing 'conduction through the air' in the house, first from the butler's basement to the maid's attic. Later he achieved a distance of some 500 yards, promenading in the street outside the house and listening with his apparatus to the world's first radio signal. That was ten years before Hertz and twenty years before Marconi.

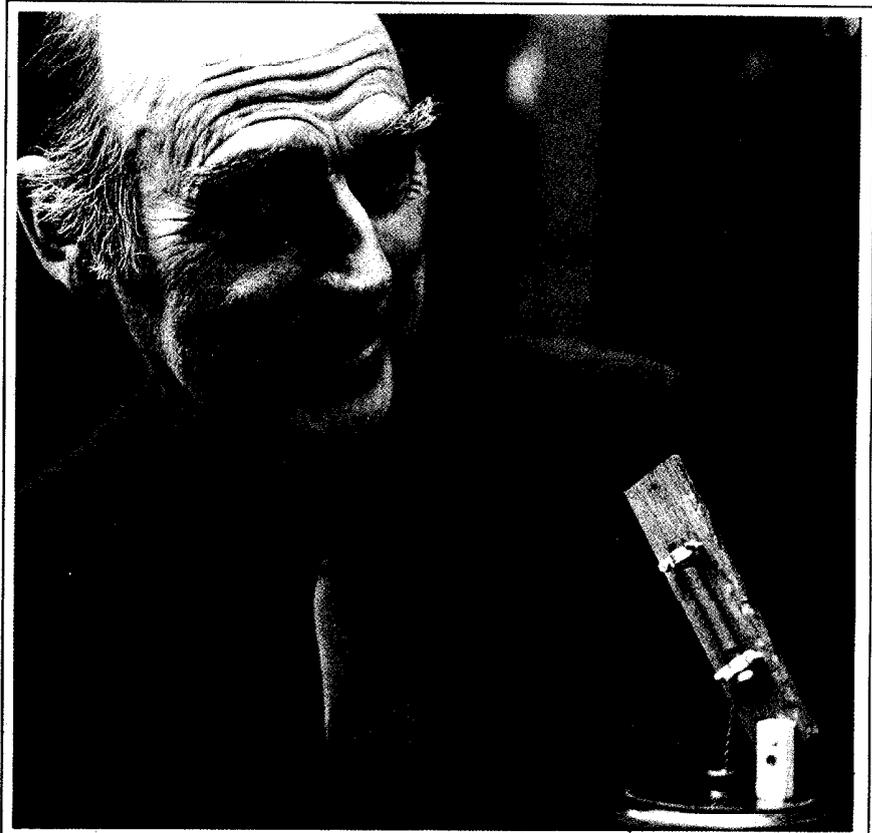


Photo: Robert Hawes

Ralph Barrett with the replica he constructed of Hughes' 1878 microphone, consisting of a carbon rod with tapered ends resting loosely between carbon cups. It worked well enough to use for a recording of the ceremony.

Mr. Barrett introduced a number of guests.

Pat Leggatt, BSc.Eng., FIEE, retired Chief Engineer, External Relations, BBC, said:

"It is a happy coincidence that Broadcasting House, the present headquarters of the BBC, is only a stone's throw from David Hughes' house here in Great Portland Street. The BBC – and indeed I can speak for all broadcasters – has much reason to be grateful for Hughes' work, since none of us would have got very far without microphones.

"While BBC microphones are not now quite the same as Hughes' invention, the ones we do use are in a direct line of development from his carbon contact original and it is therefore a great pleasure for us to see this plaque unveiled.

"Moreover, a particular form of his microphone also acted as a detector of wireless transmissions; and he was the first to discover and demonstrate the feasibility of wireless spark transmission and coherer detection. He did not fully understand the mechanism of his discovery – but nor do most original discoverers – yet he did

appreciate that it was an effect of considerable significance. Had it not been for the blinkered reaction of the then president of the Royal Society and his colleagues who pooh-poohed Hughes' achievements, the development of wireless communication could have been advanced by some years and we might even have enjoyed the benefits of the BBC rather earlier than was the case; so you can see what priceless advantage was missed!

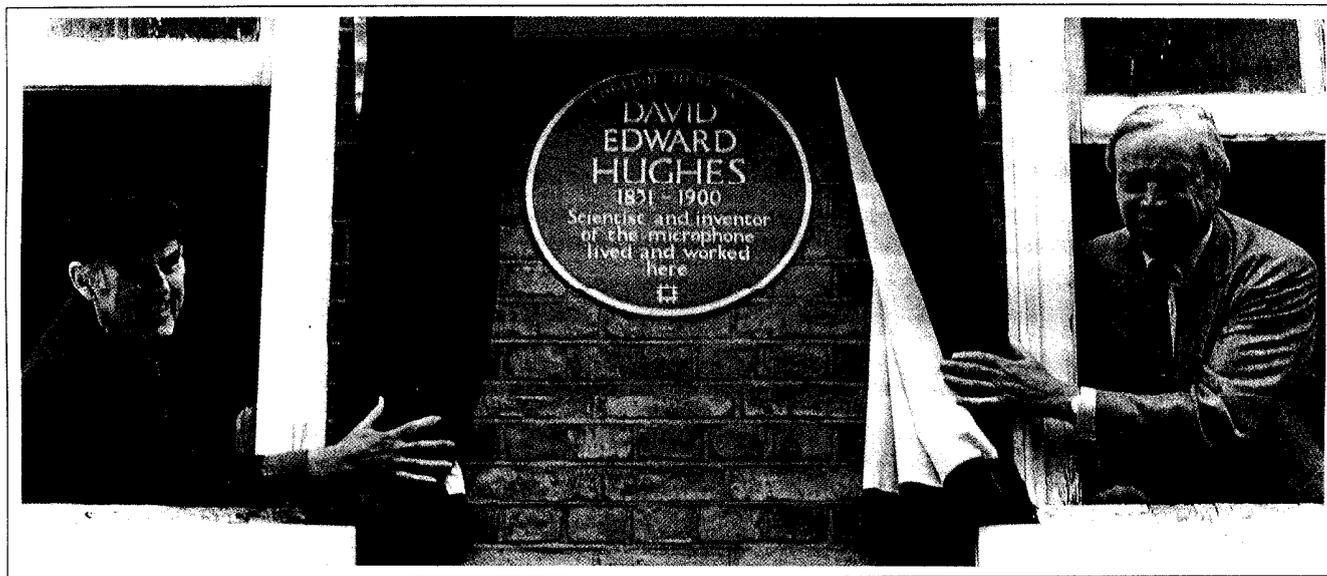
"We should like to thank English Heritage for making this occasion possible; and to applaud Ralph Barrett for initiating this recognition of David Hughes. These things are not done without considerable effort and dedication."

Tony Bridgewater, who worked for Baird age of 22 and served a lifetime in broadcasting, retiring as Chief Engineer, BBC Television, recalled how the late Campbell Swinton had been able to save some of the notebooks and experimental apparatus of Hughes, which is now in the London Science Museum. Quoting from early sources, Mr. Bridgewater, continued:

"Hughes had evidently carried on wireless telegraphy up to distances of

• Continued on next page

News



Unveiling the new blue plaque at number 94 Great Portland Street, London, are Ralph Barrett and Victor Belcher. The plaque reads "David Edward Hughes, 1831-1909, Scientist and inventor of the microphone, lived and worked here".

• Continued from previous page

some hundreds of yards. He had a clockwork apparatus by which he sent wireless signals, and he used to walk down the street with a telephone connected to some sort of cohering arrangement, applied to his ear, to see over what distances he could get signals. He succeeded in obtaining what was actually wireless telegraphy, but his ideas about the phenomena were all wrong, because he thought it was a case of electrical conduction through the air. This, of course, was before the date of Hertz' discovery of the electro-magnetic waves called by his name- waves, the existence of which had been predicted by Clark Maxwell."

Geoffrey Dixon-Nuttall, Chairman of the British Vintage Wireless Society and a retired director of Roberts Radio - Britain's only surviving radio manufacturing company, said:

"When asked to speak on 'Historical Societies' it was quite a surprise to realise that the title included the British Vintage Wireless Society. Anybody who stumbled on one of our meetings unawares might be forgiven for thinking that he was at a car boot sale. Nevertheless, among all the apparent junk, we have our serious side.

"We are part of a generation that is more interested in the past than any previous one. The David Hughes generation was concerned with the future; either we have more sense of history, or we are just insecure. This interest in collecting relics has consumed us at a great rate. An

antique was once something over a hundred years old, but now we have articles rated as antique which I can remember as new.

"This interest in articles which are old but not strictly antique has come just in time to save from complete destruction the domestic wireless set, which was once treated as a member of the family but then thrown out to make way for the TV.

"David Hughes and Hertz made the bricks with which Marconi started the radio industry. Over a span of about sixty years this grew to be a major employer in this country and then shrank with amazing speed. No television sets and very few radios are now made here.

'Valve radios are regarded now' as almost Victorian, but it is quite a shock to realise that they only went out of production about twenty years ago.

"The preservation of a lot of old radios will probably not really be welcomed by posterity, but as I said, we do have a more serious side. Were it not for Societies such as ours there would not be any 405 TVs left in working order so that we could appreciate how far we had come. We can demonstrate bright emitters and magnetic detectors. Astonishing things emerge, like the oil-film coherer which appeared only recently. The results produced by all this equipment vary from the impressive to the pathetic, and provide a useful way of puncturing legends.

"So forgive us for the junk which fills

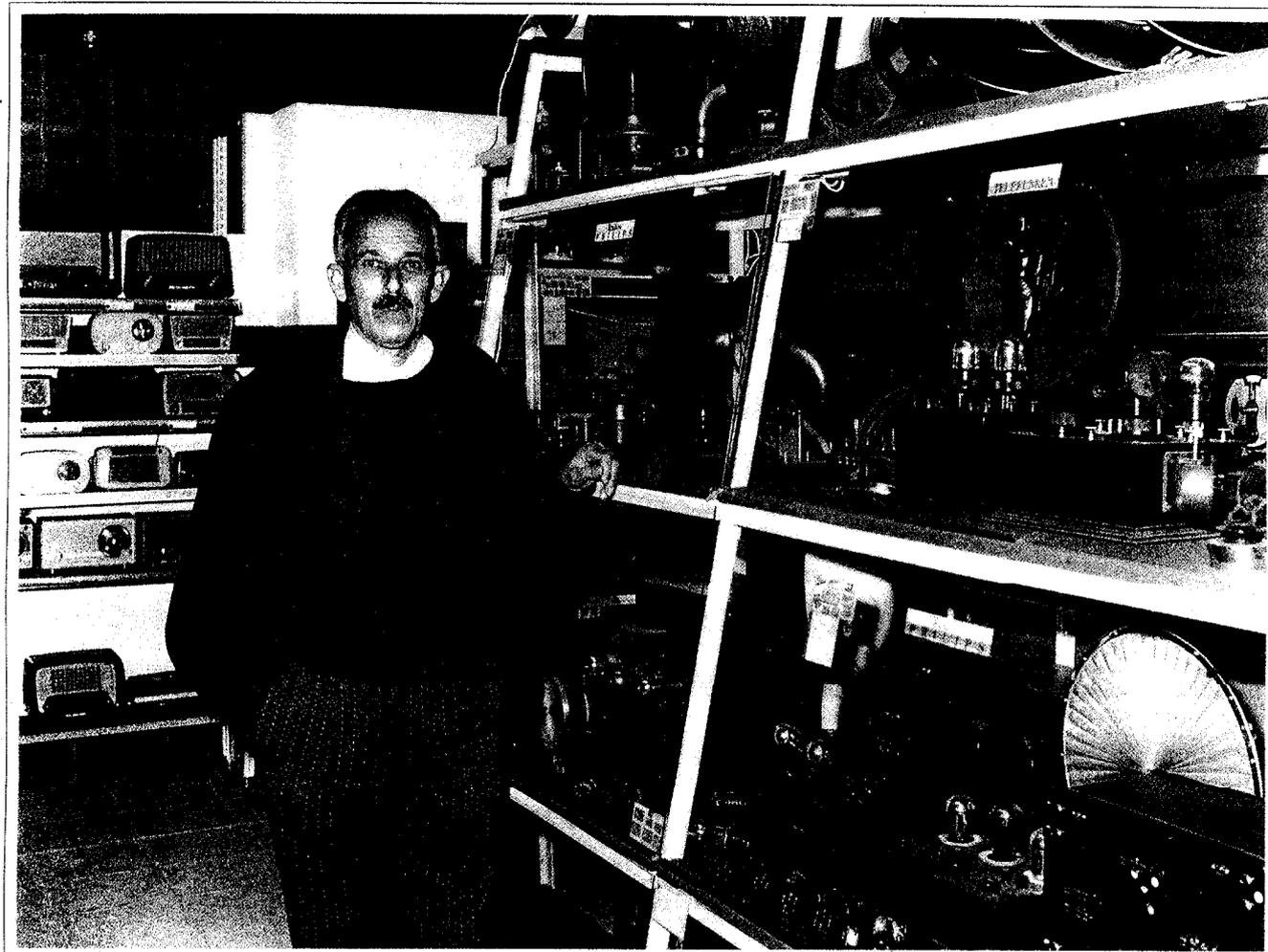
our spare bedrooms and exasperates our wives. Some day the equivalent of the True Cross may be found, in the form of the actual piece of coke used by David Hughes as a detector, and it will all be worth while."

After the ceremony of unveiling of the plaque, some of those present attended an informal dinner arranged by Mr. Barrett, where he introduced them to other notable guests including Irene McCabe, archivist of the Royal Institution; Janet Faraday, a relative of the famous scientist; and members of the Royal Society of Arts, the IEE, English Heritage and the BVWS.

Excerpts from the ceremony were broadcast in the "Science Now" programme on BBC Radio 4.

English Heritage, who are responsible for the erection of the distinctive blue plaques, have just published a guide detailing the 600 which have been fixed to London buildings over 120 years, mostly to men and the majority to people associated with the arts and politics rather than scientists and inventors, although Baird, Blumlein, Marconi, Morse and Muirhead are featured. The book is available at £6.50 from booksellers or the EH, P.O. Box 229, Northampton NN6 9RY.

Editor's note: Ralph Barrett has written a special article for the Bulletin on Hughes that will be published in a forthcoming issue. He is also presenting a lecture demonstration to which members are invited at 5.30pm on 18th May 1992 at the IEE, Savoy Place, London. There will be no admission charge and free refreshments will be provided.



Spanish Museum

Juan Juliá, of Sant Celoni in Spain, who has recently joined the Society, has his own radio museum near Barcelona, containing apparatus from all periods, mainly from European sources, but much from the UK too. He is here pictured in one corner of the museum, to which Society members on holiday are invited. Anyone who wishes to visit should contact the Bulletin Editor.

Well, it was Wireless Telegraphy

(Extract from Chamber's Journal Feb. 26, 1881)

The extensive use of the heliograph in the Zulu and Afghan campaigns has given a wonderful impetus to the art of signalling by means of flashes of light. The heliograph itself as now perfected leaves little to improve upon; but it is of course only applicable so long as the sun is above the horizon. Hence, the attention of inventors is chiefly concentrated upon improve-

ments in lamps for signalling at night. As our readers are aware, the alphabet used is a combination of short and long flashes, corresponding to but not exactly identical with the dots and dashes of the Morse telegraph system. The most obvious plan for signalling at night is to use a lamp with a movable diaphragm, which will shut off the light for long or short periods as may be required. Captain Colomb some time since contrived a lamp, in which a jet of pyrotechnic mixture, consisting largely of powdered magnesium, was propelled into a spirit-flame by means of bellows. This arrangement gives long or short flashes of intense light, which would be visible for many miles. M. Mercadier has lately proposed a cheaper, and at the same time an efficient form of apparatus for the

same purposes. It consists of an argand burner for oil or gas, to which is supplied on pressure of a key (like a Morse key) a stream of oxygen. This gas, of course, at once intensifies the light; and signalling can be carried on without difficulty.

The mind boggles at the spectacle of a scarlet-jacketed Tommy puffing firework dots and dashes from a bellows at 15wpm, or keying bursts of oxygen over a primus-like flame in Morse code.

The enemy would hardly need his heavy artillery if the apparatus went wrong!

— contributed by Eric Westman.

Feedback

Letter

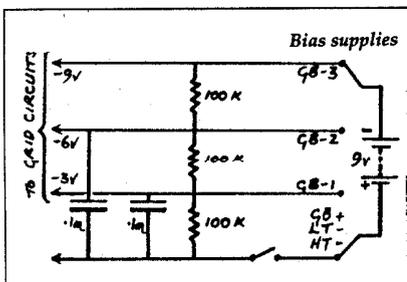
from Rod Burman

Battery radio supplies

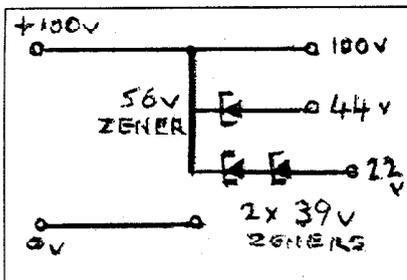
With regard to Pat Leggatt's article "Workshop" on supplies for battery radios. I would suggest that rather than using resistors to drop the 100V HT rail to lower levels for screens and detectors, a much better solution is to use a reverse biased zener diode in series with the 100V supply.

This method has the advantages of (a) No current measurement and subsequent calculation is required; (b) The voltage will not rise when the set is switched off, thereby preventing extra stress on decoupling capacitors; (c) The applied voltage will be substantially constant and independent of the current drawn, which is of particular importance for sets using filament resistors; (d) As the zener diode is a relatively low impedance device compared with valves, there will be very little increase in the source impedance seen by the lower level stages in the radio.

0.5 Watt wire ended zener diodes of the BZY 88 or BZX 79 series should be adequate for most applications.



Pat's circuit



Rod's modification

Comment from Pat Leggatt:

Rod Burman's proposal is certainly a much better solution than my suggestion of dropping resistors for screen and detector HT feeds, avoiding trial and error current calculations and the need for decoupling capacitors.

If only to show that I have considered his letter carefully, I would add the pedantic point that, with the set switched off, series zeners would not prevent voltage rise on any built-in decoupling capacitors if the latter were perfectly non-conducting. But any leakage current, of which there is almost certain to be some with old components, would bring about the desired voltage reduction.

Thank you Rod for this useful improvement.

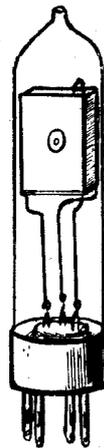
Letter

from Graham Dawson

What is it?

I have an item for the "What is it?" spot in the Bulletin except that the question is "How old is it, and what was it used for?"

The object is a Deuterium Arc, Type DF6, No. A490 presumably from the manufacturer's Supply Company (Wickham) Ltd. since it has their label. Filament Volts 4.0, Arc Current 0.5, British 4 pin base, 5ins. high.



The device was found in a box of valves in the stores of an ITV company some 20 years ago. Can any of your readers expand on the data printed on the label. Was it used in a projector or telecine machine and what was the colour and intensity of the arc? Any further details would be interest.

Letter

from Gordon Bussey

BBC Television Demonstration Film

In the fifties, 1953 in particular, there was a daily two-hour trade test programme from 10am to 12 noon. It comprised of six film sequences that alternated with test card 'C' and was accompanied by music. To recreate this two hour programme I require an accurate schedule (ie has someone got a copy of the 'running order'?) and the full music titles that accompanied test card 'C'.

Restoration Tips

Letter

from John P. Downes

Radio Marconi

With regard to the request for information concerning "Radio Marconi" published in Bulletin 16/1, I can recall this name being given to the station at Bologna, Italy during the 1930's. This was in honour to Guglielmo Marconi who was born in the area.

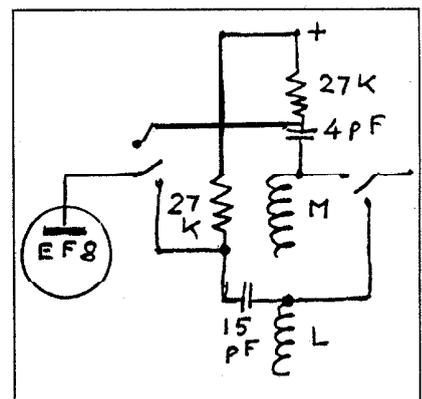
Restoration Tips

Readers are invited to contribute to this feature. Please send your tips to Geoffrey Dixon-Nuttall, our technical correspondent, at Longmeadow, Miles Lane, Cobham, Surrey, KT11 2EA.

No 1 Fine details: The modern biological detergents are very useful for cleaning fine details, such as the grooves on Ekco knobs. A soak in e.g. Biotex will be found to shift almost everything.

No 2 Aluminium cleaning: The detergent used in dishwashing machines (Sun, Finish) is very good for cleaning aluminium. A soak in hot water and a pinch of the detergent will work wonders on coil cans.

No 3 Coil problems: Unless you are very patient it is very difficult to deal with those Philips coils which have three bands in one can. The primaries of these coils seem to be wound with very fine wire and frequently are found to be O/C. Ray Whitcombe's method certainly works, but a much simpler way is to convert the circuit to resistance coupling (see diagram). This does not ruin the performance as much as one might think. The values have been found by experiment.



• Letters continued from page 21

Letter

from Pat Hawker

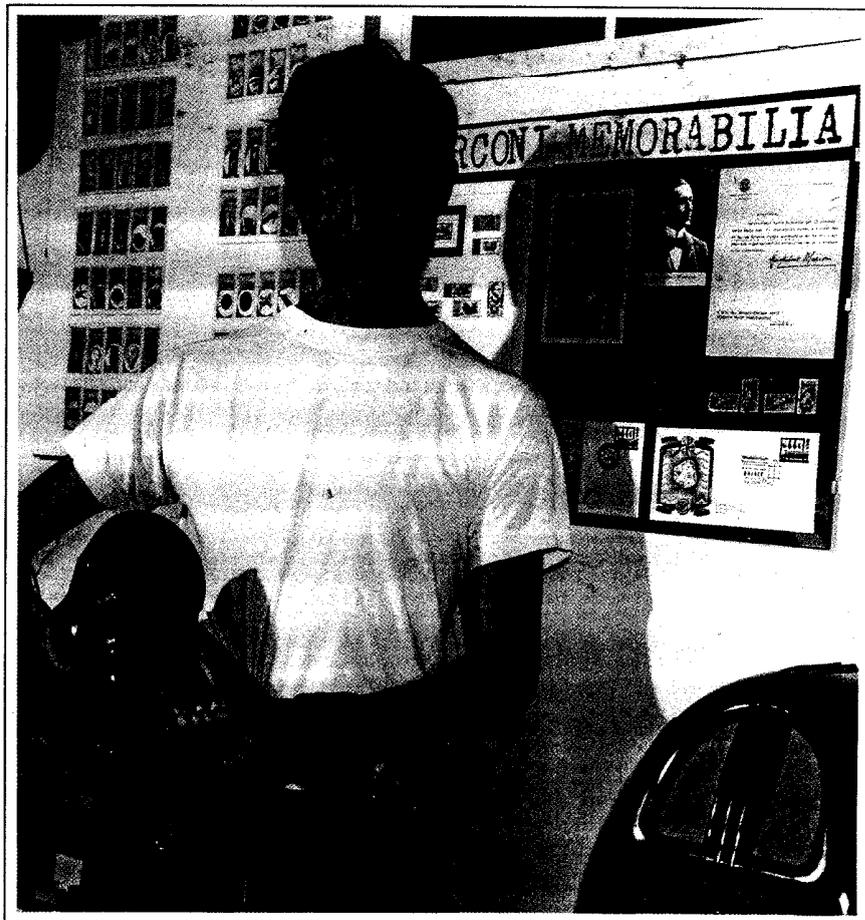
John Sargrove (Szabadi) innovator and pioneer

Geoffrey Dixon-Nuttall, in describing John Sargrove's early attempt to automate the production of radio receivers, questioned whether he is still remembered. Readers may be interested to know that details of his remarkable career as an innovator and pioneer of automation were given by Dr K G Beauchamp (University of Lancashire) at an IEE Weekend Meeting at Imperial College, July 1980.

He showed that Sargrove designed the UA55 as an "all-stage" valve capable of functioning as a variable-mu IF amplifier, an AF amplifier, a superhet mixer, audio power amplifier or as a power rectifier; he tried to introduce automation into the labour-intensive radio industry before its time had come. Sargrove set up a single massive machine, the ECME - Electronic Circuit Making Equipment - that, relying entirely on automation concepts, with minimum human intervention, could produce a continuous stream of finished and tested radio receivers from an input of raw materials only.

Independently of Dr Paul Eisler ("father of the printed circuit board") Sargrove made a 1943 patent-application for the form of printed circuit described by Geoffrey Dixon-Nuttall rather than the silk-screen printing technique of Paul Eisler not publicly disclosed until 1947, by which time Sargrove was developing the ECME machine for which the simple two-valve receiver was to be the first pilot project. It was then intended that the ECME would be used to produce a six-stage superhet with the RF section built as a conventional assembly on a sub-chassis, though this (and also a multiple-plate miniature oscilloscope) never reached quantity production.

Sargrove in 1947/48 announced the receipt of an order for 25,000 two-valve sets from the Chiang Kai-shek government of China and an order for 20,000 from the Indian government. Both orders were later aborted due to political changes in those countries and problems in getting the receiver into quantity production. In fact the ECME never reached its full production capacity. There were technical problems due to the poor



Italian Museum

Enrico Tedeschi, who is a member of the Society, has recently opened the "Museo della Radiofonia" at 242 via di Acilia, Rome, which members on holiday will be welcomed. On show are more than a hundred sets dating from the early Twenties to the Sixties as well as historical documents and novelties.

The museum is entirely devoted to sets used in the home - Italy already has an Electricity Museum and one covering post office telegraphy - and the curator is happy to help visitors with research. Enrico set out to create a museum where sets and working and can be handled: He told me: "Just as nature-lovers prefer to see birds in the trees rather than in cages, I think radio-lovers prefer their sets out of glass cases" he says., could be touched".

Visitors can listen to vintage programmes on the receivers and can see documentaries on wireless subjects on video monitors.

The museum is open four days a week (not Saturday to Monday) and you can telephone Enrico on Rome 60.56.085 or write to the museum for details.

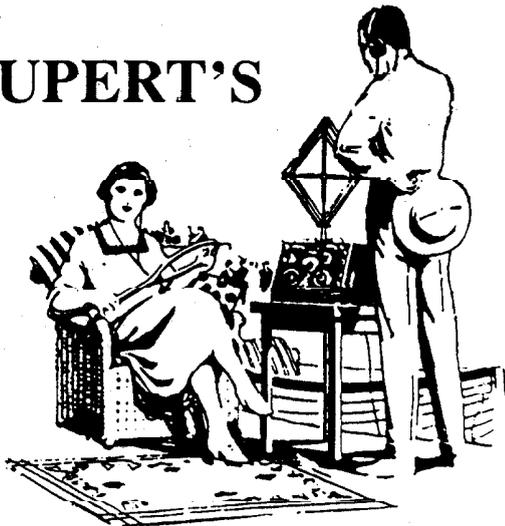
tolerance of some fabricated components and warping of plates during spraying. There were also difficulties due to the uncertain state of British industry with power cuts and material shortages in the winter of 1947. The firm John Sargrove Ltd failed when the financial backers withdrew. The large ECME was transferred to A C Cossor Ltd but no further use was made of it. Sargrove himself set up Sargrove Electronics but left that company in 1955 to form Automatic Consultants and Associates Ltd.

He was born John Adolphe Szabadi in London in 1906 of Hungarian parentage, spent his early years with his parents in Budapest but returned to

London in 1920 and studied at the Regent Street Polytechnic whilst serving apprenticeships with several small engineering firms. In 1903 he was employed by Tungram Electric Lamps Ltd (later British Tungram Radio Works), from 1933 to 1940 as Chief Engineer in the technical department. He changed his name to Sargrove in 1938, and in 1940 left Tungram for Mervyn Sound & Vision Ltd.

Editor's note: Our veteran member Frank Brittain, who was with Cossor for many years, confirms that the Sargrove equipment was purchased by the company, then kept under curiously rigid security arrangements. It was in a locked store and was unlikely to have been acquired to be put into use. Perhaps it would have threatened some development Cossor were envisaging. Its final fate is not recorded but it was probably junked.

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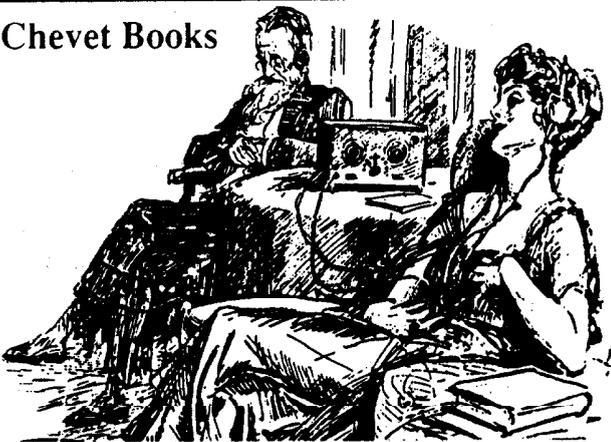
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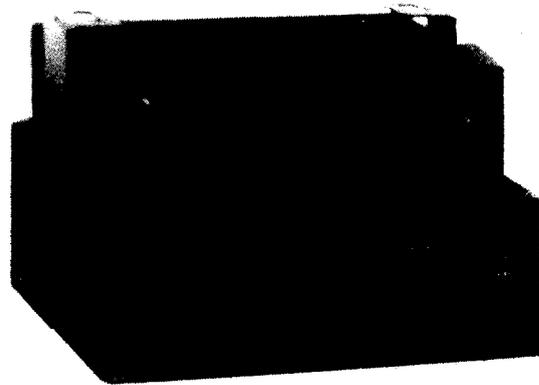
The Vintage Wireless Book List

A regular listing containing 100s of out-of-print, old and collectable
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