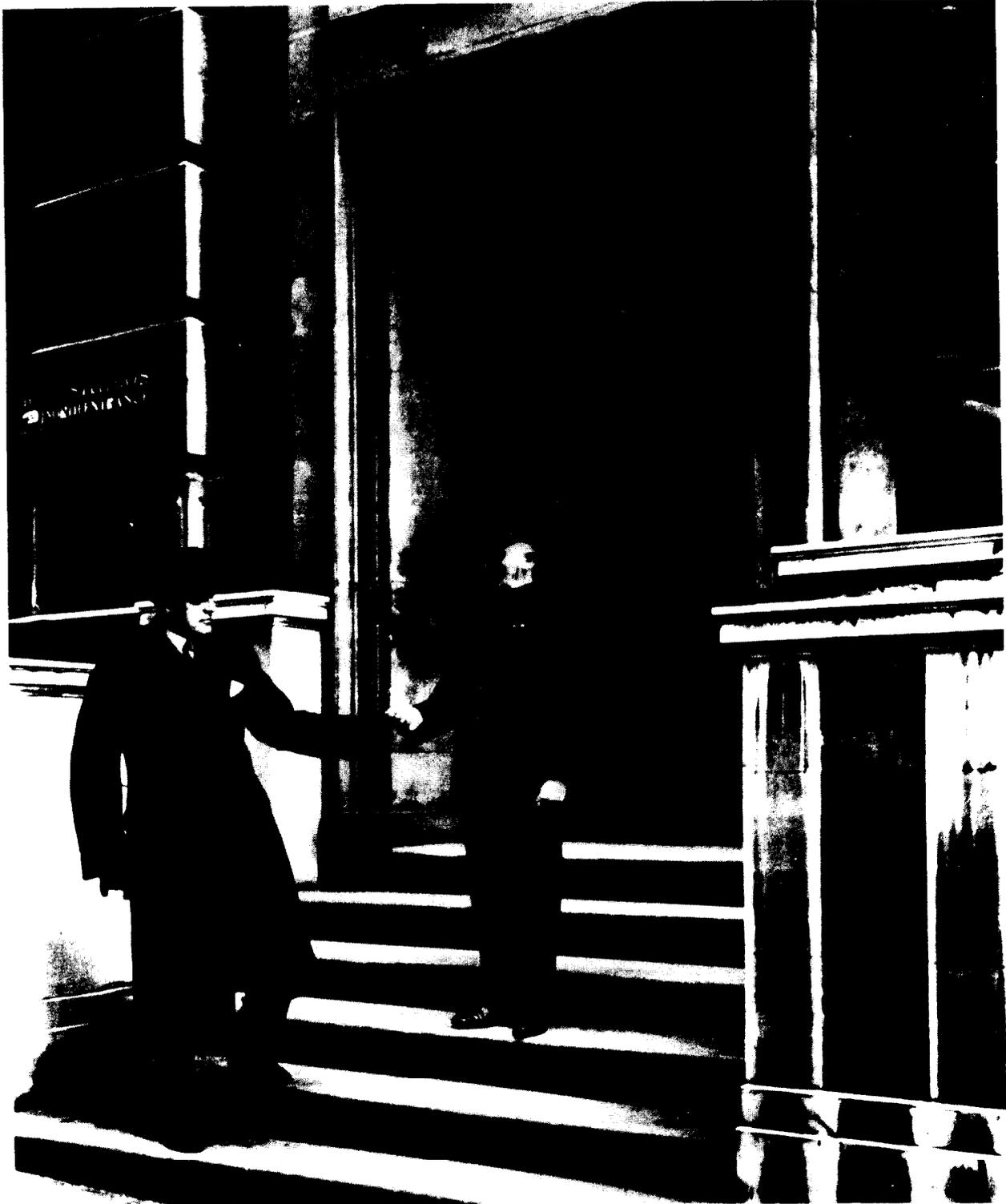


BULLETIN OF THE BRITISH

# VINTAGE WIRELESS

SOCIETY



*1922: Sir John Reith hands over the keys of Savoy Hill when 2LO moves on. See centre pages.*

**BULLETIN OF THE BRITISH  
VINTAGE WIRELESS SOCIETY**

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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

**BRITISH VINTAGE WIRELESS SOCIETY**

Chairman: Geoffrey Dixon-Nuttall, Longmeadow, Miles Lane, Cobham, Surrey KT11 2EA. Tel: 0932 862592. Treasurer: Alan P. Carter, Lime Tree Cottage, Loxhill, Hascombe, Godalming, Surrey GU8 4BQ. Tel: 048632 535. Membership Secretary: Gerald Wells, Vintage Wireless Museum, 23 Rosendale Road, West Dulwich, SE21. Tel: (081) 670 3667. Bulletin Editor: Robert Hawes, 63 Manor Road, Tottenham, London, N17 OJH. Tel: (081) 808 2838. Information Officer: Dave Adams, 69 Silver Lane, West Wickham, Kent BR4 ORX. Tel: (081) 776 1531. Committee Members: David Read, Ian Higginbottom, Rupert Loftus-Brigham, John Howes, Pat Leggatt.

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

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British Vintage Wireless Society  
Volume 17 no. 5**

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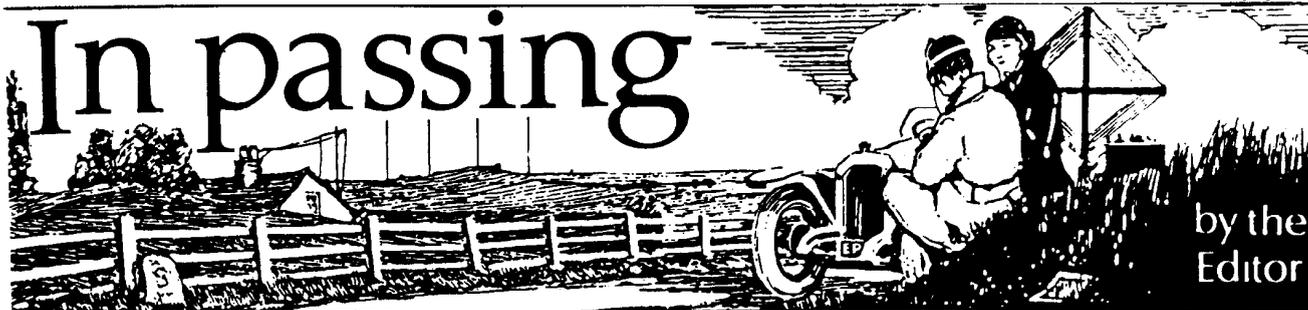


**VINTAGE  
WIRELESS  
MUSEUM**



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



by the  
Editor

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.

## Society News

At our recent Annual General Meeting, the committee was re-elected for the following year. Their names are listed on the inside front cover of this issue.

Members are reminded that annual subscriptions are due on January 1st and prompt payment will be much appreciated by the Treasurer. Despite increases in costs, the subscription has been held at the same rates as last year. It is our policy to plough back the maximum to members. With six Bulletins, six Newsletters, a Supplement on Early Television, a fine Marconi reprint and eight meetings this year, we think members have been offered value for money. Plans for 1993 include more meetings which will extend our activities over a greater area of the country and help to raise income.

## Meetings

Dates of our meetings for 1993 have now been confirmed and are as follows:

January 10, Swapmeet at Portishead; March 7, Major Auction and Mini-Swapmeet at Harpenden; March 21, the new meeting at Alexandra Hall, St. Augustins Gate, Hedon, Hull; May 9, Swapmeet at Portishead; June 6, Major Swapmeet and mini-auction at Harpenden; July 11, Swapmeet at Southborough; September 5, Swapmeet at Portishead; September 19, Major Swapmeet and mini-auction at Harpenden; October 17, Swapmeet at Southborough; November 28, Major auction and mini-swapmeet plus AGM at Harpenden.

Details and booking-forms for these meetings, which are open only to fully paid up members for 1993, will be sent to them for each event but enquiries can be made to the following Organisers:

Robert Hawes (Harpenden), 63 Manor Road, Tottenham, London, N17 0JH. Tel: 081 808 2838; John Howes (Southborough), 11 Crendon Park, Southborough, Tunbridge Wells, Kent, TN4 OBE. Tel: 0892 540022;

Alex Wooliams (Portishead), 11, Norton Road, Knowle, Bristol, Avon, BS4 2EZ. Tel: 0272 721 973; Ernie Roberts, (Hull), 33, Charles Street, Hedon, Hull, North Humberside, HU12 8HT.

Apart from the new meeting at Hull, it is hoped to add another new one during the year, near Stockton on Tees. Members are invited to contact Fred Hay of 27 Crayke Road, Stockton-on-Tees, Cleveland, TS18 4E (Tel: 0642 674560) and to offer their support.

Other meetings to which members are welcome are those of the NVVR – the Dutch Society – on March 27, June 12, September 25 and December 11; also the Open Day at the Chalk Pits Industrial History Museum, Sussex, on September 12.

Societies with related interests both in the UK and abroad are invited to send details of their meetings to the Editor.

## French museum

In November, the French Secretary of State for Communications officially opened the Musee European de la Communications installed at the 18th century Chateau de Pignerolle, saint-Barthelemy – d'Anjou, France. The museum covers every aspect of communications from the earliest times, including the telegraph, the telephone, radio, recording, photography and the printed word. Members on holiday in that part of France are recommended to pay it a visit.

## Replica contest

We have already received a number of entries ranging from crystal sets to a multi-value set, for our "Replica Contest" to be staged at our next meeting at Harpenden. Any member may enter. Entries must be working receivers, newly built or restored originals, based on designs published before 1940. The published original designs (wireless magazines, blueprints or photocopies) should be exhibited with the entries, which must be constructed using specified original components or from kits.

## Marconi reprint

Our reproduction "Marconi Cavalcade" reprint (for which we are grateful to Gordon Bussey for supervising printing), distributed to members with the last Bulletin, has been well received but one reader, Eric Westman of Weston-super-Mare has spotted an original error. He writes:

I was surprised, to read in the Marconi Cavalcade, the entry for May 13th 1897: "Experiments between Alum Bay and the hired ferry boat, the SS Mayflower, with 60-foot mast, prove successful, and on May 13th communication is achieved over eight miles of sea." According to the information I have, on Thursday May 13th, Marconi successfully transmitted from Flat Holm island in the Bristol Channel, over 3 miles of sea to his receiver on Lavernock Point on the Welsh coast, witnessed by a bevy of famous scientists. Later, on Tues 18th May, he successfully transmitted 8 (nearly 9) miles across the Bristol Channel from Lavernock Point to Brean Down (a couple of miles from here). Did the writer in Cavalcade get mixed up? Oddly, the boat in the Solent was named the "Mayflower", and the tugboat Marconi used in the Bristol Channel was the "May" and both events were supposed to have taken place at the same time in May! Actually, the Bristol Channel experiment was the most important thing that had happened to Marconi – it was make or break, and at first it looked like the latter, until someone moved his receiver down from the cliff to the beach and so lengthened his aerial by 60 feet. It was in November 1897 that Marconi set up his transmitter in Royal Needles Hotel I.O.W. That was an interesting blunder in the Cavalcade 57 years ago.

## Rare Televisor

A rare Baird Televisor came up for sale at Christie's South Kensington in December. Dating from about 1929 it was a "C" model, of which about 15 were made, some thought to have been for a Berlin exhibition.

Continued over page >

## In passing

> Continued from page 54

Although of the same basic design as the well-known "tin-box" Televisor, and employing a spinning disc, this model, known to Baird's staff as "The Noah's Ark", was supplied as a complete sound-and-vision receiver rather than a vision-only set. The components of the "C", including a 24" scanning-disc, were mounted on a proper diecast alloy chassis instead of being simply screwed down to a wooden baseboard as in the case of the tin-box set and it was supplied in an impressive mahogany case, costing altogether £150 (well over £3,000 in today's money).

The vendor had acquired the set from Baird's Hendon laboratory, following the abandonment of the Baird transmission system by the BBC in 1936.

One other example is known to exist, a slightly earlier model which is now at the Bradford Museum of Film, Photography and Television. At the auction bidding reached over £9,000 for the Televisor.

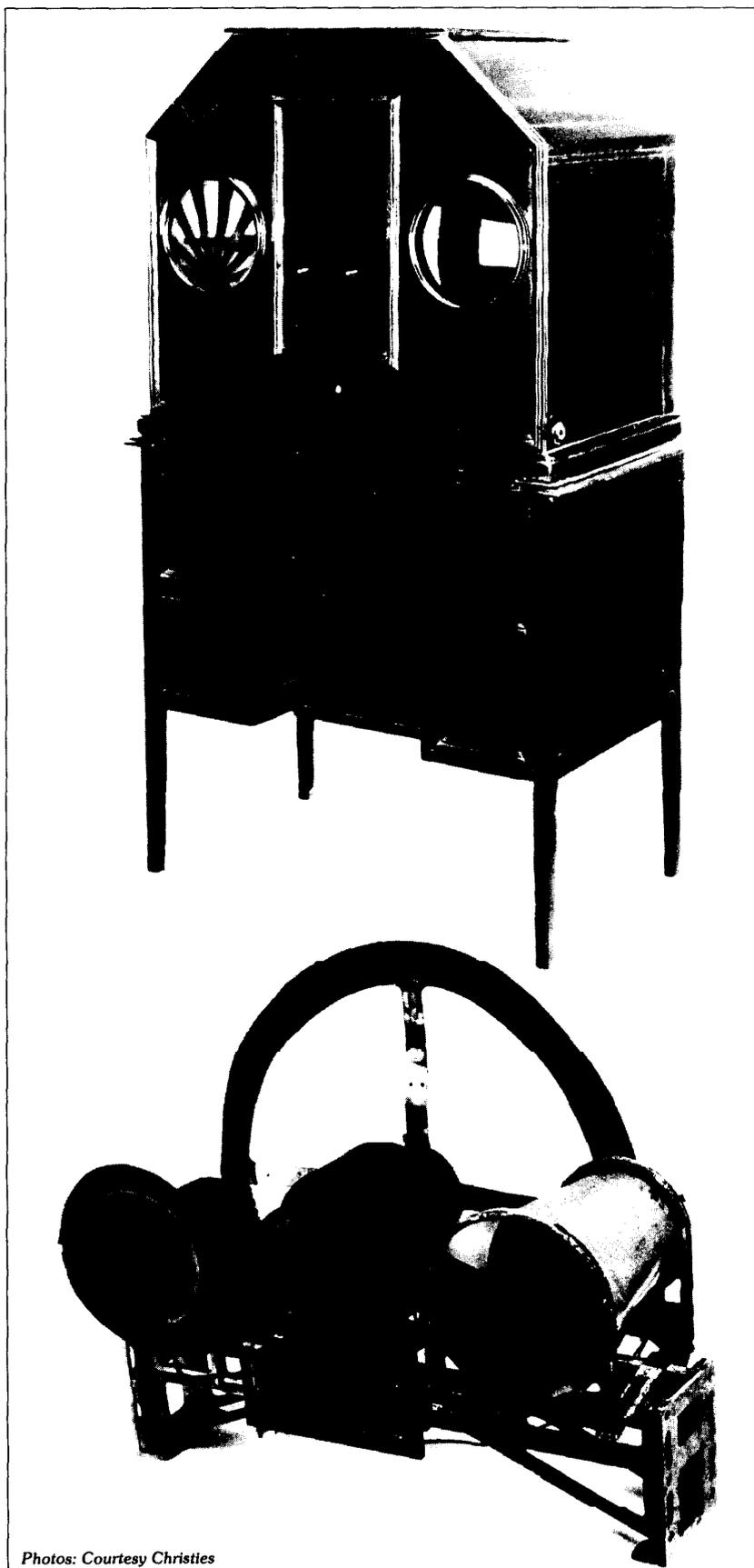
### Murphy biography

"A first class Job", Joan Long's biography of her father Frank Murphy, is to be republished after being out of print for a long time. It tells how, in the depression of the 1930's, Murphy founded a radio manufacturing company that became world-famous and introduced innovative cabinet designs and put forward ideas about industrial relations which were ahead of his time, then lost it all after a boardroom dispute. The book is well illustrated with splendid photographs and contemporary advertising material. It costs £8.50 including postage in the UK and \$15 for USA and Canada and is available from Mrs. Long at 5c, Weybourne Road, Sheringham, Norfolk, NR26 8HF.

### An ode

John Brown writes with a little lament that the age of more romantic writing - even on technical subjects - has passed, sending a poem about Wheatstone which he found in a book on wireless telegraphy:

"Around the Magnet, Faraday  
was sure that Volta's lightnings play  
but how to draw them from the wire?  
He took a lesson from the heart:  
'tis when we meet, 'tis when we part  
Breaks forth the electric fire"



Photos: Courtesy Christies

## Tasteful measurements

'A Currentless and Voltmeter-less Voltmeter'.

(A selective translation by F. M. Trier from 'Memento Tungfram' Volume 5, by Roger Crespin. in Editions Crespin, 65, Avenue Barbusse, Pavillons-sous-Bois, Seine, about 1952)

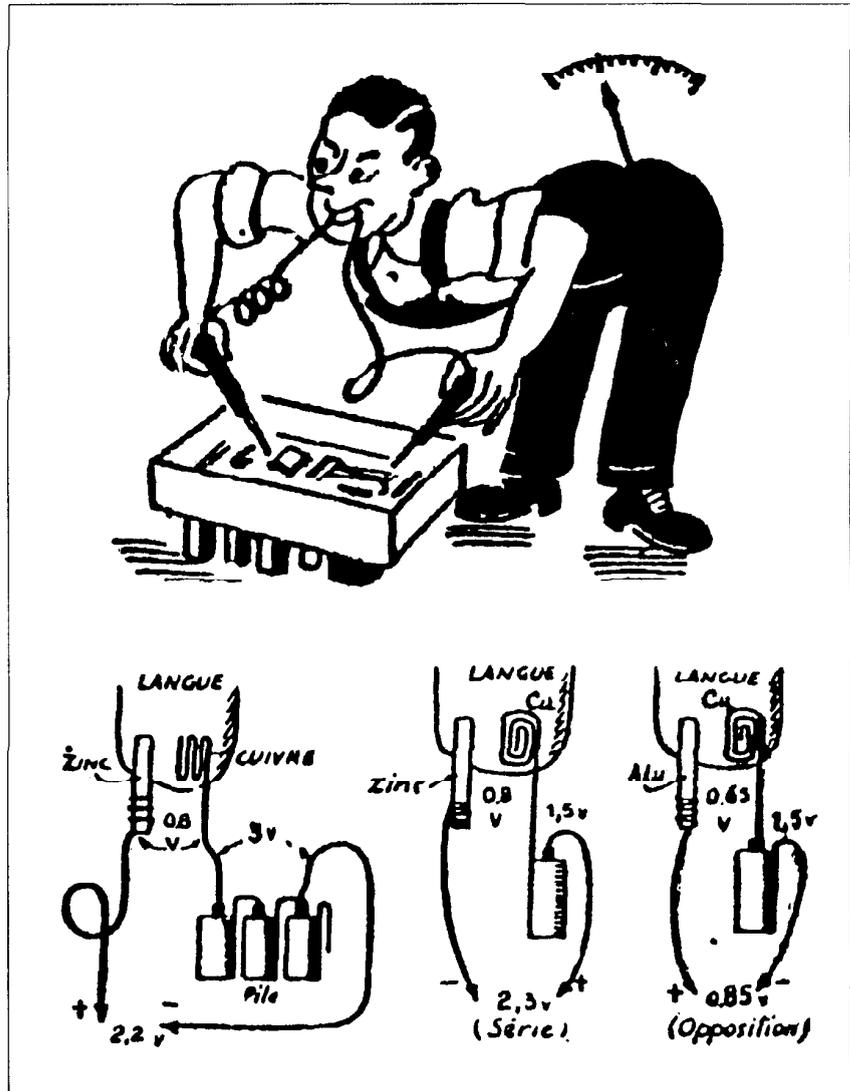
Lacking a 20,000 ohms per volt voltmeter, still less an electronic one, how is one to measure an AVC voltage or small d.c. voltages generally, where the ordinary voltmeter gives a false reading, or there is simply no voltmeter available?

Very simple: one has only to 'measure' with the aid of two wires held on the tongue but not touching each other. After a little practice the tongue judges voltages fairly accurately by the sensation produced.

Better still, if one, two or three cells of a pocket lamp battery, giving 1.5, 3 or 4.5 volts, are connected in series with one of the wires *in opposition* to the voltage to be measured, measurements can be made with excellent precision.

For example, if two cells of the battery in opposition to a voltage between cathode and chassis produce no sensation, a voltage of 3 is indicated.

A further refinement is to use a copper wire with one end bared for a sufficient length to be folded back on itself several times to form an electrode, plus a second wire terminated in a zinc electrode. These form on the tongue a copper/saliva/zinc couple, the voltage of which has been checked as 0.8 volt on an electronic voltmeter, while with a copper/saliva/aluminium couple 0.65 volt was obtained.



This gives the opportunity for real precision: if the two wires terminating on the tongue in copper and zinc produce a sensation when chassis and AVC line are touched, but none when the wires are reversed, then the AVC voltage is 0.8 exactly.

If to reach the no-sensation point with 2 cells of the battery one has to add the copper/saliva/aluminium couple, one has  $3+0.65$  or  $3-0.65$  volts, that is 3.65 or 2.35 volts depending on the connection.

"Certainly this makeshift voltmeter is not the equal of a 20,000 $\Omega$ /volt instrument, but it doesn't work too badly."

### Author's note:

"In the saliva couples, the voltage of the copper electrode is positive to that of the zinc or aluminium. The question of polarity could present difficulties in using this technique; although perhaps not, since the polarity of the voltages being measured is known.

"Although not mentioned in the original article, it is worth noting that when the voltage to be measured is exactly opposed by battery or couple voltages (giving no sensation on the tongue) then no current will be drawn from a high impedance AVC line and the measurement will be accurate.

"The electrodes could be mounted on a piece of plastic which could be held on the tongue by closing the mouth, I must say I've not tried the system!"

## Research

# The Lost Cord

by Geoffrey Dixon-Nuttall

As is well known, the mains voltage in the U.S.A. varies between 110 and 120, according to district. It is therefore usually taken as 117. (It is also 60 hertz, but that does not concern us at the moment.) Most U.S. sets in this country are run on a 117V auto-transformer, but these are clumsy things. When these sets were imported into the U.K. it was common practice to fit a line cord dropper. These destroy themselves in time, as the heat rots the rubber. It would be nice if these sets could be run without, wouldn't it?

In the days of valve T.V. sets the heaters were run in series, and some of the later ones used a diode as a voltage dropper. This works because if you remove one cycle of the A.C. you will remove half the energy supplied, and hence we have a wattless loss of power.

In theory all one has to do is to put a diode in series and, hey presto, 240 volts is turned into the equivalent of 120. I decided to see if it worked.

Well, it does, but there are several problems. Due to thermal inertia the valves seem to get hotter than they should, so an additional resistor is necessary. The resistance of the valve heaters is not ohmic, as they spend half their time cooling down. The valve heaters on a typical American set measure about 120 ohms cold, but nearly 800 hot! As the waveform is so peculiar (it is in effect pulses of D.C. every fiftieth of a second, with another fiftieth of nothing in between), it is as far as I know not possible to do any calculations. Meters don't like it either!

The only way to test the arrangement is to measure the power transmitted. A way of doing this is to fit up a bulb in series with the heaters, or use the dial bulb if there is one, and note the brilliance when running on 117 volts. This should then be the same on 240. I set up another similar bulb as a reference, fed from a transformer through a variable resistor.

It might be argued that a dial bulb is not the same as the densely packed heater of, for example, a 50L6, but although it heats up quicker, it also cools down quicker. Inspection of the colour of the heaters shows that the

bulb is a good guide to the power. The voltage distribution between heaters of, say, 12 volts and fifty volts is the same with the sine wave or pulses.

A complication is that, if you think about it, the diode does not affect the H.T., as the rectifier can only see the positive pulses anyway!

The series resistor will be more manageable when dealing with the later 0.15 amp valve series, so that was tried first. A bit of fiddling about produced the result of about 340 ohms in series with the diode to produce equivalent results to the original 117V.

I have tried this on several American AC/DC sets. In all cases the performance was apparently unaffected. The procedure is as follows:- Set up the set on 117, and check that it is working normally. Measure the H.T. voltage, and note the brilliance of the bulb. If possible, set up another one as reference. Then add the diode (right way round!) and 340 ohms and try again on 240. Don't worry, it won't explode. Check the H.T. voltage, and drop if necessary by a resistor in series with the H.T. rectifier only.

It is not easy to calculate the wattage of the 340 ohms resistor, but it feels like about 6-8 watts, judging from the heat generated. Look at the energy we have saved!

This is fine for a medium-sized set, but the real midgets require a bit of fiddling with heat shields. The cabinets in most cases have got used to being hot.

Most of these midgets were not really intended to be left on all day, and I am quite happy to settle for the odd half-hour of demonstration occasionally. The performance is on the whole not good enough for serious listening.

I have tried this system on the older series of 0.3 amp valves, but the wattage does get a bit excessive. I have a Little Maestro running on 240 without a line cord, but it really is HOT.

As a general rule the value of resistor seems about right, but trials continue. It would be interesting to do some experiments on things like the Marconiphone T11DA, which had two tappings on its line cord, and also the sets with 0.1 amp valves, such as the Alba C112.

So that is the state of play at present. Have a go and see if anything more can be learned. On the whole I think it is better to under-run than over-run. Do not forget that the diode and resistor are at mains potential!

# Tracking down data

by Dave Adams,  
BVWS Information Officer

It may have occurred to some of you to wonder what talents or resources, secret or otherwise, your information officer might have that equip him for the task. Well here are some facts.

I think it might be helpful for many of our members if I were to list the sources of circuits and service data - which is what most people are wanting most of the time - that are generally available.

First and foremost are the manuals and service sheets produced by manufacturers. These generally are the most informative, but not the most generally available, source. They were, in their day, mostly issued only to retailers and sometimes to accredited agents only. Manufacturers varied very much in their attitudes in the matter of whom, if anybody, they would supply.

In 1934 two trade magazines, 'Wireless & Electrical Trader' and the 'Broadcaster' began publishing, either in the magazine or as a supplement, their versions of manufacturers' manuals. I say 'versions' in that they appeared in a standard format. This meant, in many cases, some economy in space and words but I think it is fair to say that these 'Trader Sheets' and 'Broadcaster Sheets', as they became known, served the trade for many years. These, of the trade magazines, are the ones of greatest use to us in that they covered the period that we are interested in. Others came along afterwards.

The other main source is a rather diffuse one. It is, again, magazines - all the many others of any period including the present day. (The details and stories of the many periodicals that came and went is a fascinating study in itself.) Circuits and descriptions of commercial sets are to be found in most of them. One very important source is our 'Bulletin' and also 'Radiophile' and 'Radio Bygones'. These contain articles by accomplished, dedicated restorers who by the sweat of the brow have fathomed the circuit and have been generous enough to pass on this invaluable knowledge for the benefit of the rest of us. Of the many period magazines, one deserves a special mention and that is 'Wireless World'. This has been favourite reading

Continued on page 62 >

Book Review  
by Pat Leggatt

## Auntie's Birthday Book

"THE BBC: 70 YEARS OF BROADCASTING" by John Cain, former BBC Controller of Public Affairs (Published by the BBC at £9.95)

As noted in the introduction, this book is aimed at the general public and those beginning a study of the media in Britain. It concentrates on "programmes, people, policies and politics"; and in these terms it provides an excellent review of developments over the seven decades.

After a brief outline of the technological foundations laid down from the late 19th century to the early 1920's, we come to the formation of the BBC in 1922 with a staff of four and we then follow the rapid expansion of the Company up to 1927 when the Corporation took over. The vision and leadership of John Reith are given full credit in establishing what was to become recognised as the world's best and most influential broadcasting organisation.

Succeeding chapters take us through the developments of the 1930's, including of course the inauguration of the television service, and continue to the wartime years, post-war expansion and on to the ending of the BBC's monopoly in 1955. In concluding chapters the author reviews the competitive impact of the new technologies of video recorders, cable and satellites, and their continuing importance up to the present day.

In telling this story, John Cain follows two interleaving strands. First, the ever-changing political framework within which British broadcasting was and is constrained and the BBC's continual endeavours to counter Government control. The second strand concerns the internal development of the BBC's structure, organisation and programme policies as the audience grew and the social and political influence of broadcasting became increasingly significant.

In the first strand the key landmarks are the nine enquiries into broadcasting by Government



Jack Payne and the BBC Dance Orchestra in 1928

Committees, usefully illustrated in a colour pull-out calendar chart. Audible and visible evidence of the second strand is of course the broadcast programmes: and the author reminds us of a host of these, well selected to highlight the social and cultural contexts as these changed over the years.

The book includes a lavish gallery of photographs of personalities who have played a significant part in BBC development, whether in Government, in BBC management, or – the majority – as performers. It is a real pleasure to be reminded of so many earlier favourites whom one thought forgotten but who are in reality still old friends, to older readers at least.

While taking a generally objective line on programmes, John Cain is not afraid to reveal his own preferences here and there, a personal touch which adds a welcome liveliness.

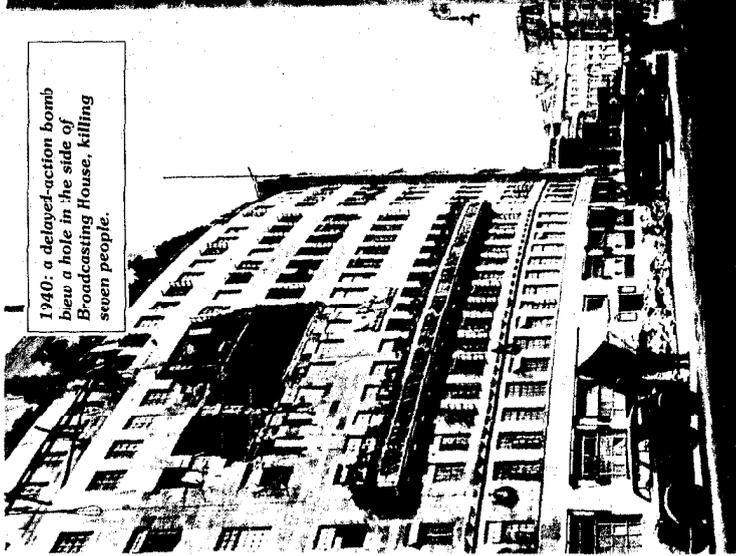
It is not the author's intention to dwell in much detail on the engineering aspects of BBC history but in what coverage there is we find a few misleading statements. These are of little consequence for the general reader, but should perhaps be noted for the more specialised BVWS audience. For example it is said on page 7 that 'The Marconi Wireless Telegraph Company' was founded in 1900. Strictly speaking this is true: but in fact 'Marconi's Wireless Telegraph Company (to give the exact title) was simply a renaming of the

'Wireless Telegraph and Signal Company' founded by Marconi in 1897. The aim of Marconi and other workers in the early 20th century was to develop point-to-point communication, and they did not then envisage broadcasting to 'thousands of individual receivers' as the author suggests.

Simultaneous Broadcasting (page 16) was not really conceived as a solution to the limited range of transmitters. It was introduced to enable listeners in any part of the country to be offered programmes produced in any other part, incidentally saving money by avoiding the necessity for continuous programme production at every individual station. The date of the first simultaneous broadcast is noted in the BBC Yearbook of 1930 as May 1923, not August as stated on page 17.

Also on page 17, a rather ambiguous sentence could be taken to imply that the long wave 5XX transmitter at Daventry lasted until 1992. In fact Droitwich took over the long wave service in 1934, as correctly stated later on page 35. Rather than Daventry being able "to transmit to virtually the whole nation", its range was 150-200 miles on a valve receiver, covering England and Wales but excluding Scotland and Northern Ireland.

# 70 Years of Broadcasting



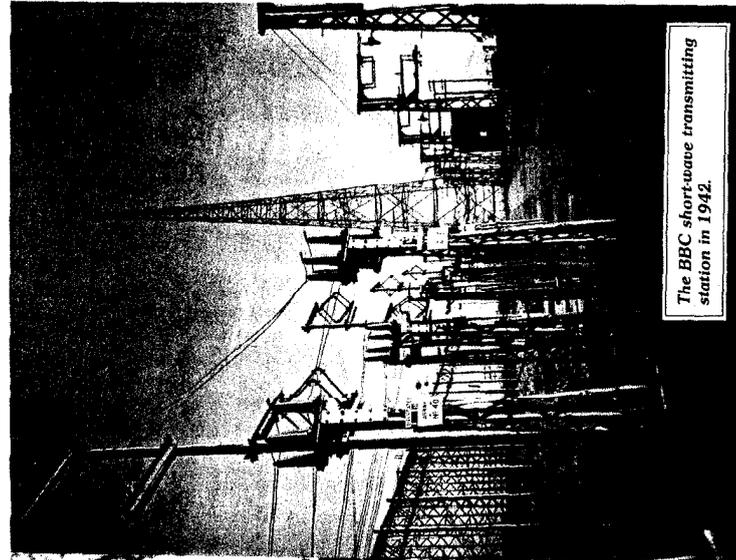
1940: a delayed-action bomb blew a hole in the side of Broadcasting House, killing seven people.



1928: Engineers with some of the primitive equipment then employed.



HRH Princess Elizabeth broadcasting to the Youth of the Empire on her 21st birthday.



The BBC short-wave transmitting station in 1942.



1939: J. 3. Priestley and Leslie Howard at the microphone.



1932: Stuart Hibberd reading the news.



1928: patients in Charing Cross hospital have the wireless installed.

## BBC Book



*William Joyce, known as "Lord Haw-Haw" because of his plummy accent, who broadcast German propaganda to the British in the last war.*



*Brian Johnston with a "Suitcase" outside-broadcast kit.*

*1927: testing microphones for a commentary on the Derby.*

> Continued from page 58

On page 20 the author ventures a brave but unfortunate sally into technicalities with a reference to "— valve sets, originally referred to in their more powerful form as superhets and heterodynes." I don't know quite what to make of this! On another point, while the use of Bakelite for radio cabinets was comparatively new in the early 1930's, a reference to it as "a new plastic" overlooks the fact that it was patented by Dr Baekeland in 1908.

Page 44 tells us that at the outbreak of war in 1939 all BBC transmitters were put on the same wavelength. In fact there were two separate synchronised groups, on 391 metres and 449 metres, both radiating the single Home Service. Later a 'Forces' programme was radiated on another synchronised group.

Finally on page 66 it is said that there had been a union of European broadcasters since 1926: indeed there had, but in 1926 the Union Internationale de Radiophonie (the predecessor of the post-war European Broadcasting Union) had been in existence for a year or more, having been founded in March 1925.

Although a list of minor inaccuracies has taken up appreciable space in this review, it must be said again that readers in general can safely ignore them and enjoy this lively and wide-ranging account of the history of the BBC.



> Continued from page 57

for professionals and amateurs for many years. It has provided many 'write-ups' of commercial sets.

How am I able to do this? My main source is Gerry Wells' library at his Vintage Wireless Museum at 23 Rosendale Road, West Dulwich, London SE21 8DS - the headquarters address of the BVWS. From Gerry's collection I can quickly find a manual, a 'Trader Sheet' or 'Broadcaster Sheet'. I wish I could say that we had facilities to photocopy there but we do not; so there is a little delay while I get the copies done elsewhere.

If the required data is not found thus, then I turn to other sources, mainly to magazines. Here one needs indexes (all right 'indices' if you prefer.) I confess to loving indexes. In fact I collect them. They are the 'Open Sesame' to knowledge. Gerry has many beautifully bound volumes - heavy stuff - literally. A search can be a real physical labour. If the indexes were separate one would need only to thumb the pages instead of doing weight-lifting exercises. I have, for some publications, compiled my own index. This is a good point at which to remind you that Pat Leggatt has compiled a very comprehensive index of the 'Bulletin'. I have also made one of sets reviewed in 'Radiophile'. (Regret I cannot provide a copy)

I hope our Editor will allow me space enough to ride another hobby horse. Actually this one is not mine alone in that there are several of us who have been working on the idea of a Society Library and Archive. No, we do not have impossible dreams of a building and a staff to look after it. We are thinking in terms of dispersal among members, each looking after a section, ideally, one in which he has a special interest. A small committee would have responsibility for all aspects. We are ready to offer our collections as a nucleus. We think there will be many who would share our aims. We think there will be members, myself one of them, who would be happy to think our collections could safely be willed to the Society.

We should be very grateful for any comments or suggestions.

A final word - I would like to know of any indexes you have and of any ideas you may have to make our information service better.

You can write to me at: 69 Silver Lane, West Wickham, Kent, BR4 0RX.

## Receiver Techniques of the 1920s. Part 4

by Pat Leggatt

### Improving Sensitivity: HF Amplifiers

Reaction, while cheap, had its drawbacks and was not easy for unskilled people to operate. A more 'user friendly' alternative was to add one or more stages of HF amplification and this was popular in the prosperous United States where the cost of additional valves and battery power consumption could be accepted.

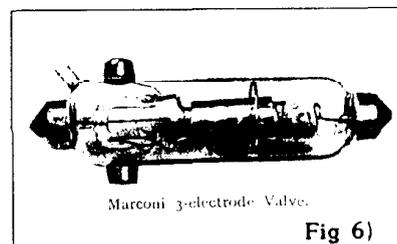
But with only triodes available in the earlier 1920's, unwanted positive feedback through anode-grid capacitance made it difficult to avoid self-oscillation of the tuned HF stages. The damping effect of the aerial on the input circuit of an HF stage was helpful in this respect, but additionally a number of methods were used to maintain stability.

The valve itself could be designed for minimum anode-grid capacitance by positioning anode and grid connections on opposite sides of a cylindrical glass envelope (Fig 6). Captain Round of the Marconi Company designed the Q valve and successors on this principle with encouraging results; but it was expensive to manufacture and was little used in domestic receivers.

Alternatively a controllable positive bias could be applied to the triode grid. The resulting grid current damping the tuned circuit and inhibiting the tendency to oscillation.

Another technique was to apply negative grid bias to reduce the stage gain below the point where oscillation would occur; or the filament rheostat could be adjusted to reduce emission and achieve the same result.

Both the latter two approaches were partially self-defeating since reduction of gain for stability left little sensitivity advantage in having an HF stage at all. On the other hand HF stages gave opportunity for additional tuned circuits to be introduced, with attendant selectivity improvement; and isolation of the aerial meant that reaction could be applied round the detector with no risk of radiating interference.



Marconi 3-electrode Valve.

Fig 6)

The best solution to the problem was to neutralise the unwanted anode-grid capacitance positive feedback by introducing a compensating degree of negative feedback. This could readily be done by using an anode coil with an earthed centre tap (actually taken to HT positive) and deriving the neutralising feedback from the free end of the coil where the signal was of course in antiphase to that at the anode. A small adjustable neutralising capacitor was connected from the free end of the coil back to the grid, enabling the circuit to be balanced. The arrangement can alternatively be regarded as a balanced bridge in which there can be no signal transfer in either direction between anode and grid, except by electronic valve action.

The American Professor Hazeltine patented the neutralising principle in 1919 under the name Neutrodyne. Another feature of his system was the mounting of the tuning coils a specified distance apart with their axes at 57° to the baseboard, a layout which minimised electromagnetic coupling between coils in different amplifying stages. Multi-valve neutralised receivers were not popular with English manufacturers owing to the high cost of valves and of royalties levied on a 'per valve' basis. But multi-valve sets with two or three HF stages stabilised in this way were widely used in America, although some manufacturers such as Atwater Kent avoided payment of Hazeltine royalties by very careful design and layout such that feedback was minimised and HF stages remained stable without the need for neutralisation.

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6. W. T. O'Dea: Science Museum "Radio Communication: Part 1" 1934; Page 68.
- K. R. Throver: "Evolution of Circuit Design for a.m. Broadcast Receivers", J.I.E.R.E. Vol. 56 No.10/11/12 1986. Page 332.
- George E. Sterling: "The Radio Manual"; D.Van Nostrand Co. New York 1928.
- Popular Wireless 5/6/26 page 523.

## History

# A Somerset Wireless Pioneer

By Eric Westman

Weston-super-Mare is known for the part it played in the Bristol Channel Tests of Marconi's apparatus in 1897, and in the Post Office trials of 1899-1900. But not so well known is Weston's radio pioneer W J Badman, who rigged up one of this country's earliest relay systems from his own powerful receiver.

Learning that a large number of citizens wanted to subscribe to his relay at 1/6d (71/2p) per week, the local Council in 1930 approved a scheme that would serve every part of the town. From Badman's premises at 9 Orchard Street (still trading as Radio Relay) wires were carried on special poles and gas lamp standards to loudspeakers in subscribers' homes. Soon he linked the town's main entertainment centres - the Rozel Bandstand, the Winter Gardens and the Marine Lake - to each other and to his system, so that a band playing at any one of these centres could be heard at the other two, as well as in his subscribers' homes.

From 1915 to the early 1930's Badman was a keen radio ham - W2ZG - known over the wide area for his Sunday morning concerts. Broadcast from a tiny studio on his premises, these consisted of a full hour of music, songs, poetry and readings put on by his staff and their families. That these concerts were greatly appreciated was proved by the large number of telephone calls and letters he received, often from quite far away.

During the early 1920's, if not earlier, W J Badman and Co manufactured wireless sets commercially - crystal sets at first and valve sets later. It is doubtful that any of these survive, but there is extant a handbook for his series of 'Tempus' time-signal crystal receivers. In the days before telephone TIM and BBC 'pips', almost the only way for a watchmaker or other person to learn the correct time

within one-tenth of a second, was to tune-in to the twice-daily time-signals transmitted by POZ Nauen, in Germany, or to FL Eiffel Tower in Paris. Both stations sent time signals every twelve hours: Paris at 10.44 am and pm; Lauen at 11.55 am and pm. The actual signals consisted of a formula of dots and dashes lasting several minutes, with the final one denoting the odd time of 10.49 in the case of Paris, and precisely midday or midnight in the case of Nauen.

The Type A version of the 'Tempus' came complete with a testing buzzer and batteries, in a box-like cabinet with a hinged lid. The whole outfit measured 8" x 7" x 5.1/2" and cost £5 for the Workshop model or £7 for the De Luxe model. The B version was pretty much the same, but bigger with a space to store the headphones. It measured 8.1/2" x 8" x 7" and cost ten shillings (50p) more than the A version. Headphones were not included, so Badman offered Browns 4000 ohm double headphones at £2 17s 6d (£2.87.1/2p) as well as Browns single 4000 ohm headphone at £1 5s od (£1.25p) The latter instrument came without headgear, so that the listener had to hold it to his ear - leaving him with only one hand free to tune the set, tickle the crystal, and adjust the time-piece.

The purpose of the buzzer was to check that the crystal-catswhisker combination was correctly adjusted so that the set would actually receive the signals when transmitted. The buzzer acted as a feeble untuned spark-transmitter; if the operator could hear it rasping in his headphones he knew that his detector was working well. He would then switch off the buzzer and, breathing shallowly and otherwise trying hard not to cause any vibrations that might upset the crystal setting, await the time-signal transmission.

The handbook that came with the 'Tempus' contained a set of graphical charts setting out, in dots and dashes, the form of the time transmissions from Nauen and Paris. It also quoted the Postmaster General's Regulations permitting an aerial not more than 100 feet long if it consisted of a single wire, or 140 feet if it had two wires, and not more than 100 feet above the ground. Buyers were told to make an

Earth connection to a water pipe, not a gas pipe. The wavelengths of the two transmitters were given, as well as a slightly fanciful description of how wireless waves function..

Mr Badman, who aged 92 retired to Bath in 1970 and continued as a wireless ham, claimed that, as a lad, he took Marconi's batteries from nearby Brean Down to be charged overnight at his father's electrical shop some miles away. Gerald Garratt, a Head of Department at the Science Museum, maintained that Badman was confusing the incident with another (probably the Post Office tests on Brean Down, which Marconi did not attend).

Weston's Museum has a moderate collection of vintage radios, including a few interesting specimens though apparently none of Badman's. Unfortunately, they are not on display, but can no doubt be viewed, preferably in the slack season, by appointment.

## Looking back . . .

From "Wireless World",  
12th January 1934, "News of the Week".

### Umbrella for Static.

Even when all man-made static is overcome, it seems that we shall still have somewhere to lay the blame for crackles in our loudspeakers. According to Dr. Willis E. Everette, an octogenarian radio enthusiast with a laboratory on "Radio Summit" at San Rafael, California, all frying sounds heard in the wireless set are caused by electrical dust emanating from a companion star of Sirius in the constellation of Orion. Dr. Everette has twenty three radio receivers, ranging from an old crystal set to the most modern multi-valve instrument.

The Doctor is now fighting atmospheric with an overhead insulation system or "static umbrella", using no aerial or earth, which he claims yields an efficiency in the receiver more than thirty times greater than that of the ordinary set. In a word it practically excludes static and fading. Unhappily he admits that the arrangement is not practical for every day use.

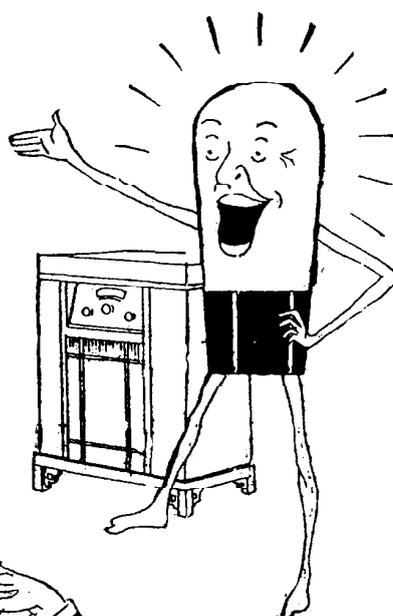
DECEMBER 3, 1932

Amateur Wireless

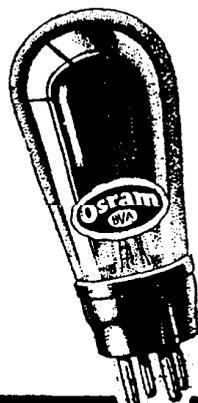
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# Feedback

Letter:

from: *Desmond Thackeray*

## Droppers and bleeders

**Bill Williams** (Bulletin Vol.17 No.3., page 49) didn't tell us *why* to use a surge suppressors in series with a capacitor "dropper".

There can be quite a big current surge otherwise at switch-on, and dial lamps are no longer thruppence each! I'd like myself to see a 1 Megohm resistor across the capacitor to get rid of any hazardous charge after switching off the power. Has anybody tried using old iron-cored chokes (and junked mains transformer primaries) as droppers? The reactance can be regulated to some extent by the amount of iron and the gap (if any) in the magnetic circuit.

from: *Geoffrey Dixon-Nuttall:*

I was interested to read the article on "Wattless Mains Droppers" in the last Bulletin. A couple of points occur to me.

The first and most important is that a bleeder resistor must be fitted across the capacitor, otherwise anybody picking up the mains plug will get a shock of up to 350 volts. About a megohm will do.

The other point is the question of the H.T. supply. The rectifier anode is usually fed from the same point as the heaters, and for an American set working on 115 volts the H.T. is usually about 100 volts. However, if the rectifier is fed from the capacitor the H.T. will be only about 65 volts. I confess I am not sure why; but try it! The answer, I am afraid, is to feed the rectifier through a separate dropper from the mains. The rather spoils the idea of wattlessness, if you will pardon the expression, but it need only be quite a small resistor, as it only carries the H.T. current.

from: *Dave Adams*

The article by **Bill Williams** was good as far as it went. A capacitive heater dropper was as far as I know first used in an early post was Philco receiver.

But what about the H.T. supply? The Pilot "Little Maestro" for example used a tapped line cord to give a smoothed H.T. supply of 150 volts that must be retained. As the authenticity of the set will now be invalidated by the proposed change to a heater supply capacitor why not go all the way by converting the set using a mains transformer to give say 70 volts for the heaters and 180 volts for the rectifier anode? The Majestic Transformer Company of Poole will wind a transformer to your specification for little more than the total cost of X type capacitors. Safety will then be assured.

Many receivers of the line-cord era used a single pole only mains switch in the neutral mains supply resulting in the chassis becoming live when switched off. Your soldering iron and signal generator etc. must of course be earthed: the danger is very real. Us not so old service engineers used mains isolating transformers that are now legally required when working on

"Live Chassis" equipment as the Health and Safety Executive will confirm. But even so equipped the danger is still present if two receivers (both with live chassis) are connected to the safety transformer simultaneously.

If you sell any electrical equipment even privately you are legally bound under the sanction of a possible £20,000 fine or 2 years jail to ensure and certify its safety, so my advice is to eschew live chassis receivers. Full details on the safety aspects regarding our hobby will be revealed in my articles in forthcoming issues of the Radiophile magazine.

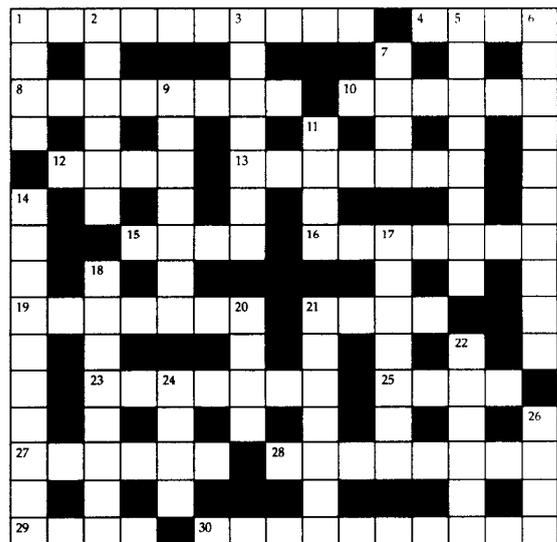
More letters on page 66 >

## Wireless Crossword No.6

Here's an attempt at a crossword using a few "wireless words" of which there really aren't enough in our vocabulary. Readers who think they can do better are invited to contribute their efforts. (This one comes from Geoffrey

### CLUES ACROSS

1. Provides a means of controlling volume of cats? (8,2)
4. Record which causes pain when it slips. (4)
8. Article in French paper fizzes! (8)
10. An asset, I believe. (6)
12. She was cheap in India. (4)
13. How characteristic to lose mother and how silly!(7)
15. Band used for tuning. (4)
16. Value that could be open, Ted. (7)
19. Tip heap untidily on the tombstone. (7)
21. A step that sounds exhausted. (4)
23. Steals valve mountings. (7)
25. Found on foot, and on P.C.B.s (4)
27. Idle the beginnings of the increase of surplus employees. (6)
28. Strauss and Schubert, for example. (8)
29. Stranded, but without much loss. (4)
30. Call, or so it wobbles! (10)



### CLUES DOWN

1. Sudden leap to avoid a potential difference. (4)
2. Upset minder can cause you to remember him! (5)
3. Sir Oliver's address? (7)
5. The enlisting American has the capacity to be a 30 (4)
6. Writer who was on the beam. (7,3)
7. Tough road material. (4)
9. A big drip! (7)
11. The backward Italian representative is feeble. (4)
14. A description of a reel of tape, possibly. (6,4)
17. Noun that gets knocked over. (7)
18. For example, LUCE. (8)
20. A funny fence. (4)
21. Composer of overtures and tounedos. (7)
22. The opening of the notice is coming. (6)
24. This feature is the opposition. we are told. (4)
26. Animal that stands to bring forth.(4)

Crossword solution on page 66 >

# Feedback

Letter:

from Jack Waller

### Earphone find

I was lucky to find some unusual earphones at a car boot sale. They are single earpieces fitted to a long handle. Research on them proved fruitful.

In response to a letter in the "Coventry Evening Telegraph", I had a telephone call from Mr. Ray G. Holl, ex works manager of B.T.H. Coventry works now retired. He remembers this particular type which was designated the "Lorgnette" after the style of eyeglasses or opera-glasses mounted on a long handle, which did not interfere with the ladies' hair styles of the day. He cannot recall the initial date of production but certainly from the crystal set days up to 1938 when my pair was manufactured.

He was a fountain of information of B.T.H. electrical products giving out a range of facts and figures beyond my ability to absorb. He said he would welcome any queries from BVWS members. He is on Coventry (0203) 414339.

I have recently contact the patent office and they sent photostats of the original copies. Although the patent does not refer to long handles I think it is reasonable to assume that the whole assembly was manufactured by B.T.H. in Coventry because of the high standard of workmanship. I worked in the late 50's at B.T.H. Coventry - maybe in the shop were the headphones were made! Perhaps the patent applicants, Messrs Ault and Boccock, are still alive and there must be many ex-workers in Coventry who will remember these. I'll write to the editor of the 'Coventry Evening Telegraph', maybe there will be some feedback. In our area details of Post 1960 patents can be obtained from computer records in B'ham through our local library. Pre-1960 ones can be obtained from The Patent Office, Sales Branch, Unit 6, No.9. Mile Point, Cwmfelinfach. Gwent. NP1 7HZ on payment of £2.86.

### Answers to crossword:-

#### Across

1 Variable-mu, 4 Disc, 8 Lemonade, 10 Credit, 12 Anna, 13 Idiomatic, 15 Gang, 16 Pentode, 19 Epitaph, 21 Rung, 23 Pinches, 25 Pads, 27 Otiose, 28 Viennese, 29 Litz, 30 Oscillator.

#### Down

1 Volt, 2 Remind, 3 Lodging, 5 Inductor, 6 Cathode ray, 7 Grit, 9 Niagara, 11 Limp, 14 Speech coil, 17 Ninepin, 18 Misprint, 20 Haha, 21 Rossini, 22 Advent, 24 Nose, 26 Bear.



Above: double "ladies" earphones made by Sterling, worn by opera-singer Tetrzzini (1922)

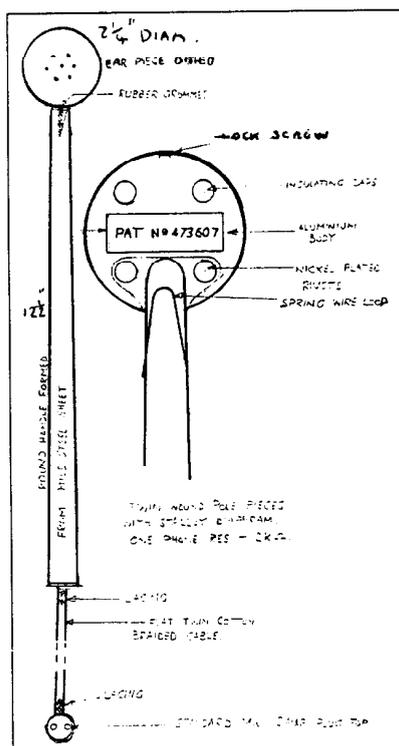
from: Desmond Thackeray

"If the cap fits,....."

The most notable contributions to distortion in crystal sets arise from the non-linear detection of small signal and the mechanical defects of "telephone receivers".

Small signal detection theory got off to a good start with a paper from Brandes in 1906, only months after Braun's patent on the crystal detector. But thereafter there seems to have been little theoretical development, a segment of history that perhaps never happened. It's an interesting exercise to fill that gap. The signal being small, it's vital to transfer the maximum RF power from aerial to detector, and then the maximum of A F power from detector to telephones. The use of an R F bypass condenser across the telephones should then prevent any wastage of R F power in AF circuitry. I find it curious however that I have never detected any difference by ear, when connecting and disconnecting such a condenser. Evidently there is enough distributed stray capacitance to do the job, as Pat Leggatt suggests. (Bulletin Vol.17 No.3. page 38)

Below: Details of Jack Waller's find.





*One of the BBC's early trend-setting shows: the 1938 "Band Wagon" with Richard "Stinker" Murdoch (left) and "Big Hearted" Arthur Askey - dressed in immaculate suits even though it was only a radio programme. They are using the celebrated ribbon-microphone developed by BBC engineers. This and other BBC microphones will be the subject of a special article in our next issue.*