

BULLETIN OF THE BRITISH

VINTAGE WIRELESS

SOCIETY

THE CHRISTMAS NUMBER
RADIO TIMES

6^D



**BULLETIN OF THE BRITISH
VINTAGE WIRELESS SOCIETY**

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**Information Exchange:
A Register of Members'
Interests**

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

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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



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.

The New Year

A busy New year is planned for the Society, including a dozen meetings, ranging from Swapmeets and major Auctions to small gatherings. We are anxious to include special displays and other activities at meetings and members would like to help to put on such events or loan items for display, we should very much like to hear from them.

Dates so far fixed for 1994 are: 9th January, Portishead; March 27th, Harpenden; 8th May, Portishead; 29th May, Southborough; 5th June, Harpenden; 14th September Portishead; 25th September, Harpenden and 4th December Harpenden. There will be several meetings at our new Wootton Bassett venue, the dates for which will be announced soon.

The Bulletin

Now that we are publishing six issues a year instead of only four as previously, the Editor requires a regular supply of good copy and illustrations. It is hoped to increase the range of topics we cover - to include more articles on such matters as the social history of radio, repair and restoration, the development of cabinet design, military radio, transmitting topics - in fact anything representing the wide interests of our increasing membership.

If you have any contributions for major articles or even snippets of information or photographs and news, don't hesitate to contact the Editor. We are happy to turn rough notes into publishable material - so please don't be afraid to send your effort, however humble you may think it is!

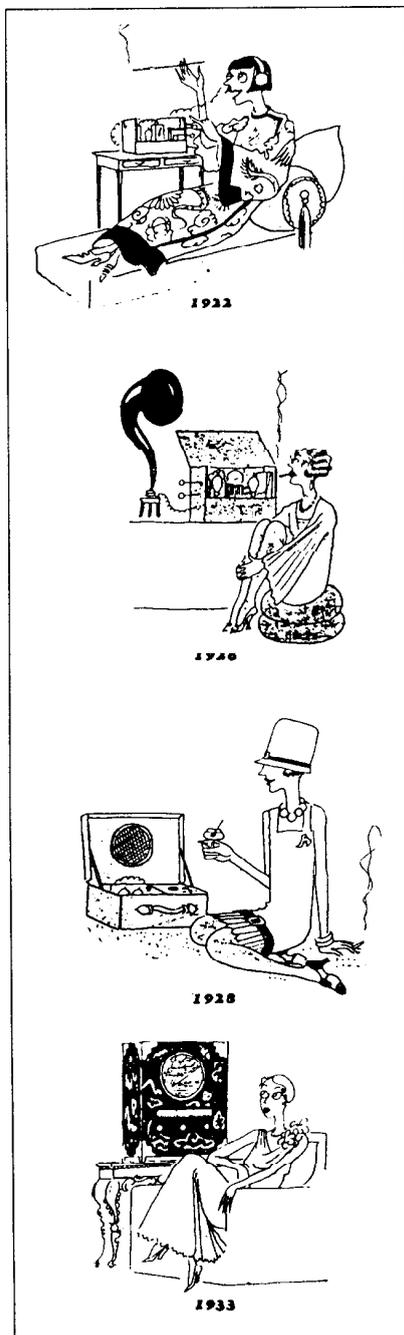
Subscriptions

Members should please note that this is the last Bulletin that you will receive unless you pay your subscription for 1994, which is due for all members, irrespective of their original dates of joining. A renewal form is being sent out and members are advised to return it with their remittances as soon as possible in order to retain their membership privileges. You will be pleased to hear that despite cost increases, the

subscription rate has again been held at the old level.

Museum News

The Burne-Jones "Magnum" receiver which featured in our last issue has



been donated to the British Wireless for the Blind Fund for which it was originally made in 1932. It has taken the set, which has braille markings, almost 63 years to return to its rightful owner - a Fund set up in 1929 to supply and service equipment free of charge to blind people, which is still going strong. The 1932 set as found in perfect condition, complete in its postal packet with battery and aerial wire and forms the nucleus of a small museum which the Fund is anxious to set up. The donation of the set was made possible through Mrs. Ivy Beresford-Cook of Chichester, who donated items left by her late husband for auction by our Society, raising funds to buy the set. The Wireless for the Blind Fund would welcome any other items for their museum - especially a Braille crystal-set.

Salutation

Society member Bill Wye of Hertfordshire, who attended the last meeting at Harpenden, has written in praise of the people who worked hard behind the scenes to make it a success. He added that he felt thanks were due but that since the AGM had to be short so that the auction could start, he did not manage to propose a vote of thanks. He sent the following instead to the Editor:

Exhortation, on the occasion of a missed vote of thanks.

*Was it a miscalculation
Oversight or aberration
That withheld the acclamation
Signalling our approbation
When our speakers' peroration
Well fulfilled our expectation.*

*There is, in my estimation
Need for some rectification
Of the silly alternation
Of our learned congregation:
Positive anticipation,
Negative congratulation.*

*Now, before our immuration
In our precious wireless station
We must change the situation.
We must send a late ovation
In a grovelling oration
And retrieve our reputation.*

In Passing: news, views, comment

A Wireless Wife's Christmas Carol

by Pat Leggatt

Oh please, dear Santa Claus, spare a thought for 'her indoors'.
I know old wireless makes my man ecstatic.
But to you I must implore, please don't bring him any more.
It fills the house from cellar to the attic.

Your reindeer are quite tireless with their loads of vintage wireless,
But none of it's for me I hate to tell.
I'd rather have my Sony than that hideous Marconi
And I really must decline the old Sobell.

You never bring me panties, just those dreary old Ferrantis
And S.G. Brown loudspeakers with the horns.
I wish that damned Igranic could be sunk with the Titanic
To gurgle tinny music to the prawns.

I shall run and get my pistol if you bring another crystal,
Whether Brownie, BTH or Metro-Vick.
The cat's whiskers that you're hawking: well really, look who's talking!
Your dirty, mangy relics make me sick.

Please keep away from my door with that ugly little Vidor
And the Murphv, Philco, Dvnatron or Pve.
I can shoot the Ever Ready if I hold my pistol steady
And the Alba also, If I really try.

You can take your nasty Philips and tiptoe through the twilips,
However Super may be the Inductance.
And stuff your kilocycles in that sack of old McMichaels.
I view them all with absolute reluctance.

No, I cannot stand the Geco or that awful old round Ekco,
And that goes double for the Double Decca.
Don't even want the KB as a plaything for the baby.
So fly away and drop the lot near Mecca.

My husband's just a punk: all he likes is wireless junk.
He's put seventeen transformers in the loo!
You can't see the kitchen table for his switches, knobs and cable.
So, while you're at it, why not dump him too?



'It's just occurred to me—perhaps there was nothing on'

New Chairman

Those of you who were able to attend the Annual General Meeting of the Society on November 28th will know that all the Committee members were re-elected for a further year. The one change is that Geoffrey Dixon-Nuttall has come to the end of his term as Chairman and I am taking up the position in his place.

We decided fairly recently in the committee that the Chairman's service should be limited to three years at a stretch, so you can look forward to a further change in 1995, if indeed I am re-elected at the next two AGMs.

Geoffrey has certainly served the Society well since 1990, guiding us carefully through the years and seeing the membership steadily increase.

On behalf of all of us I would like to express our gratitude to him and am pleased that he will remain on the committee as well as continuing his lively contributions to the Bulletin.

As to myself, I am very pleased to have the chance to have another spell as chairman, a position I have much enjoyed in the past. I am coming towards the end of my stint as a District Councillor and shall be able and willing to promote the interests of the BVWS as best I can. My thanks to the committee and all members for such a welcome opportunity.

Pat Leggatt

Editor's Note: I should like to add my own thanks to Geoff for his jovial "Chumnaship" and support to me during his office. I am relieved to know that he will continue his Bulletin articles - as will Pat: I need hardly say that good copy of the kind they have contributed for so many years is hard to come by!

The Committee

A full list of the members of the Committee will be found printed on the inside front cover of the Bulletin. Telephone numbers of the Chairman, The Treasurer, The Information Officer and the Bulletin Editor are also given there.

Reproduction – or Fake?

David Read discusses this thorny issue

For an object to be reproduced or faked the genuine article must have a value in the market place which is considerably greater than the cost of producing the modern imitation. There is of course nothing new in this and faking is itself an ancient activity. For instance carbon dating of the Turin Shroud has revealed a much younger object than was previously claimed although the technique of its manufacture remains unknown.

The Victorians produced vast quantities of reproductions which were sold as such, and whilst much of this imitated furniture and fine art, many objects were reproduced simply because the technologies developed in the Victorian age made this easily and cheaply possible for the first time. For instance Firemarks – the metal plaques on buildings denoting a particular mutual company's insurance cover and dating from the 18th Century – were moulded and cast in cheap metal by the Victorians more than 100 years later. Today many collectors imagine that these are original because they are old!

In the last 10 years or so modern technologies and materials have de-skilled and lowered the entry cost of making reproductions. Many of the techniques used have been pioneered by museums, initially as expert restorers and then to raise money in the museum's shop through the sale of reproduction artefacts. Unfortunately the techniques now available have not only transformed the economics of making imitations sold as reproductions but have attracted the attention of fakers whose objectives are quite different. Today it is virtually impossible to buy scrimshaw, carved ivory, art deco figures, and objects such as lamps, clocks and certain scientific instruments, and know whether they are genuine or not. Moreover a walk along the Portobello Road will demonstrate that the market in many

of these objects has been totally destroyed by a loss of confidence by the buying public.

How does this impact on early radio and related wireless objects, what should collectors beware of, and should the BVWS do anything for its members with respect to this thorny issue?

As one of the first members of the BVWS I remember an auctioneer's opinion of the value of early wireless: "crystal sets will never make enough money to justify their place in the catalogue". In the Autumn of 1977 as a BVWS Committee Member I assisted with the Autumn Show at the Victoria and Albert Museum which was a retrospective view of the wireless receiver from the birth of broadcasting to the introduction of the first transistor radio. The exhibition done in association with the BVWS was a great success and formed a watershed. In the auction rooms a crystal set with BBC and Post Office registration stamp would soon make £100 and then even more. The age that would make faking of radios worthwhile had arrived. The V&A effect extended to street markets and shortly after the V&A show was over I asked the price of a portable HMV radiogram at the junk end of the Portobello Road. The price was ludicrously high. "Why so much?" I asked. "Ah, this was made in the 1920's, and is rare and haven't you been to the V&A?", the stallholder asked. Even though I had personally catalogued the pre-1930 exhibits at the V&A, and this radiogram was made in '50's I decided that silence was the best policy. No doubt someone less knowledgeable bought the set and was later furious when the penny dropped.

What should a collector do?

Firstly, be more interested in learning about the subject than making money. A novice collector will make mistakes and learn, but a greedy collector, more interested in price than value, will get badly burned.

Learn the difference between new wood and old wood, French polish and varnish, black plastic and vulcanite, new screws and old screws, modern wire and old.

Acquire an eye for an achronism such as radios apparently made in the 1920's, yet with valve holders, transformers and variable condensers made in the 1930's. Very basic components such as capacitors and resistors are also a useful telltale.

These simple guidelines usually weed out the amateur fake. The professional fake is much more difficult but experience will develop your eye and intuition.

In an endeavour to provide guidance for its members, the BVWS will shortly be publishing a code of ethics which will also form part of the information attaching to application for membership. In the meantime the following guidelines should be noted.

The BVWS expects its members to be interested in the history of broadcasting and the preservation of early wireless before an interest in making money. Members for instance must not use the Society's name as a professional qualification in the furtherance of business.

We do of course have dealers amongst our members and most of these are entirely honourable. The better ones combine deep knowledge and integrity.

The BVWS specifically disallows behaviour that would bring the Society into disrepute. This is however very hard to tie down. A decision to disallow renewal of membership must inevitably be at the Committee's discretion and in the light of uncontested fact. For instance, clear and repeated cases where there is failure to honour cheques, or an individual manufacturing fakes for sale can be dealt with as a practical matter. However, the Committee is not able to intervene in contested disputes which are bound to occur from time to time.

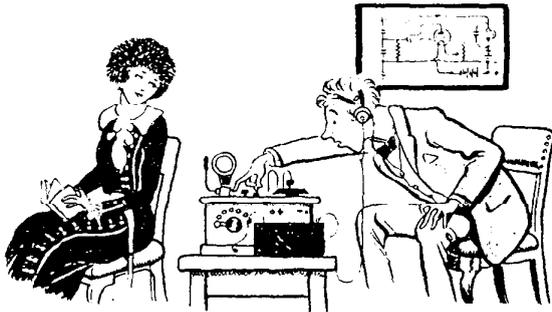
Lastly it should be remembered that within any society's guidelines, honest imitations and reproductions will form a legitimate personal or business activity. Many years and an owner or two later these may be fraudulently sold as originals by a person who "thought they were genuine". Truly the buyer must beware as the BVWS can never control and adjudicate such events.

Vintage page

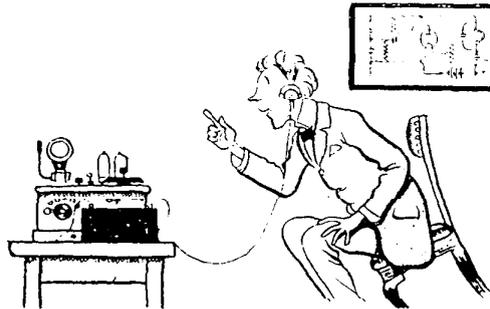
The Wireless Magazine July, 1925

That Super Set—

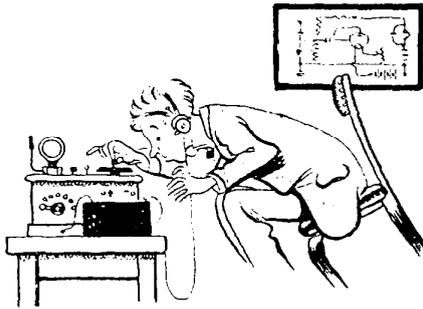
By
RENÉ BULL



ITS OSCILLATING. I OUGHT TO BE GETTING SOMETHING



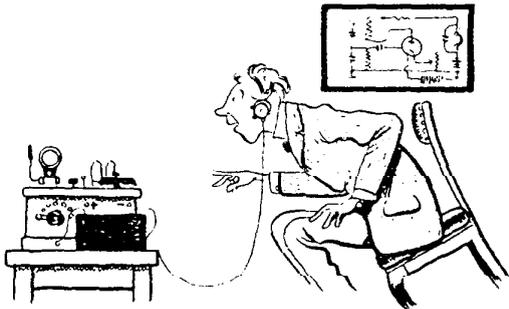
..... I BELIEVE ITS BIRMINGHAM



..... OR IS IT CARDIFF ?



..... NO! IT CANT BE CARDIFF. THERE'S NOTHING ON THERE ..



..... I'VE GOT IT! ITS ABERDEEN



..... AT LAST! QUITE DISTINCT I HEAR NEWCASTLE CALLING



..... WHAT ARE YOU DOING DARLING ?



René Bull



!!!!!!!

An American puzzle

by Geoffrey Dixon-Nuttall

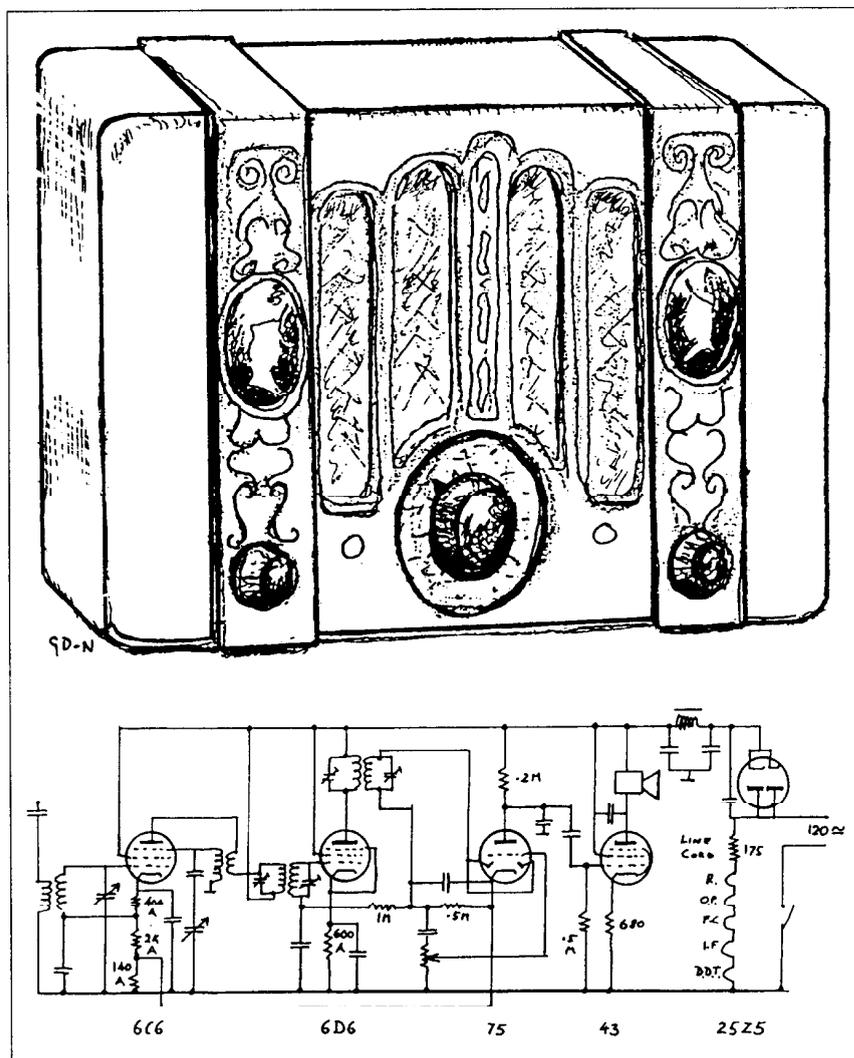
American midgets are the lowest form of radio life, as is well known, but being disposable there are very few of them left, and they are acquiring a scarcity value. When therefore an early one turned up I was interested enough to buy it.

It had obviously been severely "got at"; for example, two of the original valveholders had been changed to octals. The valve complement, as far as could be guessed, had been 6C6, 6D6, 75, 43, 25Z5. Luckily at this time they helpfully printed the valve types on the holders.

The un-original components having been cleared away, I was left with the aerial, oscillator and I.F. coils, and one of those contact-cooled Clarostat resistors. This had two sections, 400+2,000+140, and 600+2,000.

It was obvious that the valveholder marked 6D6 had been the frequency changer. At this time (about 1933) they used pentode frequency changers, as the 6A7 had not been introduced. A quick flip through the Rider manuals revealed that the typical circuit used feedback from anode to suppressor, with somewhat odd biasing arrangements. It was also common to use the same bias resistor for the L.F. stage. This is presumably to avoid using a large capacitor, as this gave a form of voltage stability. All very cunning!

It was assumed that a line cord dropper had been fitted originally, as there is no room for anything else. Down at Dulwich they have brand new line cord, so in it went. (I am running it on 120V). Having restored the circuit to something like its original form, it was discovered that the I.F. was 262 kHz, which was not unexpected, and the set worked very satisfactorily; but there were a number of unanswered questions. First, why were the first two valveholders the wrong way round? The vari-mu valve (6D6) should have been the I.F. stage, not the frequency changer! I assumed that this was an error. Then as the set is a superhet. and therefore quite a good performer, why has it a moving iron speaker? This is an Ohio type, with an



enormous horseshoe magnet, which only just fits in to the tiny cabinet.

There were no model numbers on the chassis, but around the eyelet for the mains lead was the name "International". As there are two vignettes of uniformed heads on the front of the cabinet, it seemed reasonable to assume that this was one of the "Kadette" series. (Why not "Cadet"?)

All the early "Kadettes" seem to have been T.R.F. sets, as far as can be ascertained. Also the same cabinet turned up at the last Harpenden meeting with a T.R.F. chassis in it; with a moving coil speaker too!

Then there is the question of that "Clarostat". I can account for all the sections except for one.

Also the chassis seems to have been connected to one side of the mains, as is normal. But there are two fixing

screws on the front of the cabinet going into the chassis. Even for an American, this seems highly perilous! The original cabinet back, by the way, is still present, and is Bakelite, which is a change from the usual thin card.

A nice picture of this cabinet appears in the May 1993 issue of "O.T.B.". This bears the work "Kadette" around the dial, and the tuning knob revolves through 180°, but mine lacks the name and the tuning knob is geared up to revolve through 270°.

So either International made a deluxe version (superhet, but with moving iron speaker) or did some ingenious person build himself a special? But the valveholder marked "75" is original, and so are the coils.

It may seem a waste of effort to spend time on something so cheap and dangerous, but I would dearly like to find the answer to this little mystery. Can anybody help?

Detector development

Why do crystal detectors rectify?

by Desmond Thackeray

Stephen Leacock (1910) just about sums up modern semiconductors too; N-doped germanium technology was cheaper than P-doped silicon technology. But silicon devices are the more durable; and the "holes" in p-silicon are due to absentee electrons, not moths!

I thought of this when I bought a 1N21 silicon diode at a Society swap-meeting. The 1N21 (see Fig.1.) silicon detector of Greenleaf Whittier Pickard. How did these metal-semiconductor detectors rectify? Well, non-technologists will be pleased to hear that they are not about to be baffled by a mystifying technical explanation. Actually, nobody knows how crystal detectors work! True, there are some splendid physical models of diodes based on materials of known structure and properties; but even chemically-purified silicon is likely to be far from predictable in structure and trace impurities, and carborundum and most natural minerals likewise. Nevertheless, if most of the theoretical refinements are ignored, one can still postulate that mainly unidirectional conduction of electricity across a rectifying junction is due to the differences in energy required by conduction electrons to cross the junction in the two directions. If one remembers that it takes less energy to cross a mountain pass if one starts from half-way up, then one has the key to the energy-barrier theory suggested in print as early as 1922 (Phillipi) and 1923 (Schottky). Neither that idea, nor the idea of conduction electrons arising from impurities, seems to have had much of an immediate press, perhaps because interest in crystal detectors was minimal during the thirties except to the few engineers secretly developing microwave radar. Reputedly, some of them scoured the flea-markets for old crystal detectors, before deciding to develop new diodes from scratch using pyrites and silicon. The 1N21 was the result. Why was carborundum not tried, one wonders?? Perhaps some microwave engineer can tell us.



lectricity is of two kinds, positive and negative. The difference is, I presume, that one comes a little more expensive, but is more durable; the other is a cheaper thing, but the moths get into it.

(Stephen Leacock 'A Manual of Education' 1910)

Steps to Parnassus??

In fact the search for the ideal contact rectifier seems to have started about 1906, with the discovery by Dunwoody (a General, no less!) who was working for De Forest, of the carborundum detector. Both Pickard and Pierce then took a hand in improving the engineering of carborundum-steel contact detectors, and the silicon detector was discovered in the same year. The carborundum Companies in England and in the USA both made excellent Carborundum detectors in the late 20s, long-lived and stable in characteristics, but they were doomed to neglect as thermionics boomed. And they were not even acknowledged in the literature of the '40s, when silicon point-contact mixer diodes in radar sets were a matter of life and death. Then development of these even slowed to a snail's pace as the easier technology of germanium provided "formed" point contact diodes. These are familiar to us today as a useful stand in to wire behind the panel when a vintage crystal detector can't be persuaded to work.

But actually, a genuine metal-semiconductor diode has the edge on junction devices in storing no significant charge during conduction. It will therefore respond faster to electrical signals. So be prepared to send your OA47 and 1N34a diodes to a museum; or alternatively hoard them at the bank as potential items for next century's collectors. For a data sheet from Mullard on the BAT85

"Schottky" diode tells me that "this device replaces point contact... diodes". For many purposes, it may well do so, along with the equally cheap UHF version BA481. But its very small reverse-leakage current also implies the need for a forward bias current of a few microamps to "turn it on", if it is used in simple small-signal detector circuits. A far cry from the 1N21 (shall we call it a "Pickard" diode?) which conducted well in both directions!

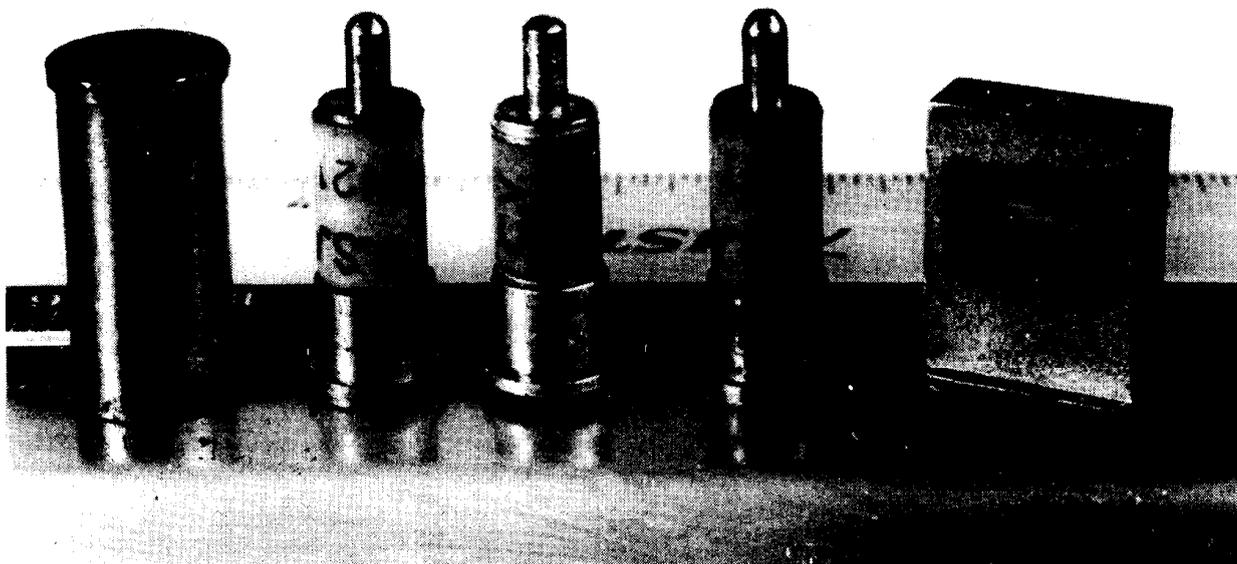
Have we seen the total demise of the carborundum diode, however? Being stable electrically, mechanically and thermally are advantages even in the silicon age. Perhaps it will not be used for Schottky diodes; but its use in blue LEDs was described in March 1982, the same month as the BAT85 data sheet. It is a pity that Pickard was never honoured by having his name associated with the 1N21 diode; but it is not too late to think of calling the carborundum LED a "Dunwoody Diode". Or you can pay personal homage by making a homebrew carborundum detector and labelling it with just that legend. It's likely to have a performance far superior to Dunwoody's efforts, generally!

Which Way Will the Current Flow?

The answer here is to use an ohmmeter and discover this for yourself. However, most useful samples of carborundum seems to conduct from steel contact spring to sharp asperity of the crystal rather than vice-versa.

Continued on page 76 >

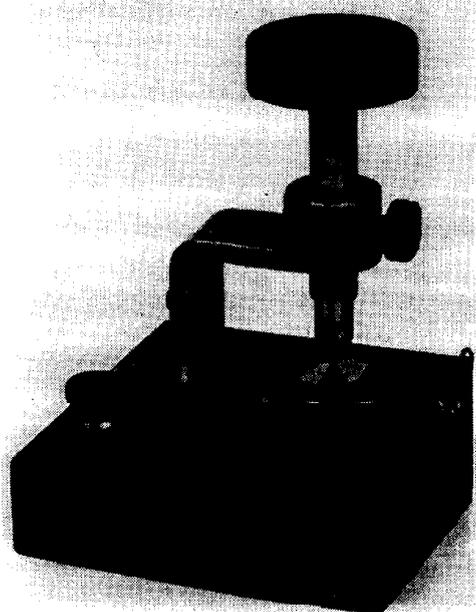
Detector development



Above fig. 1: Pickard Diodes of World War 2 (1N21) and later. (Point-contact silicon diodes).

Below left: Pickard Diode (of World War 1 and before?).

Below right: A Carborundum Company detector unit comprising their permanent detector cartridge together with bias potentiometer, dry cell holder and by-pass capacitor.

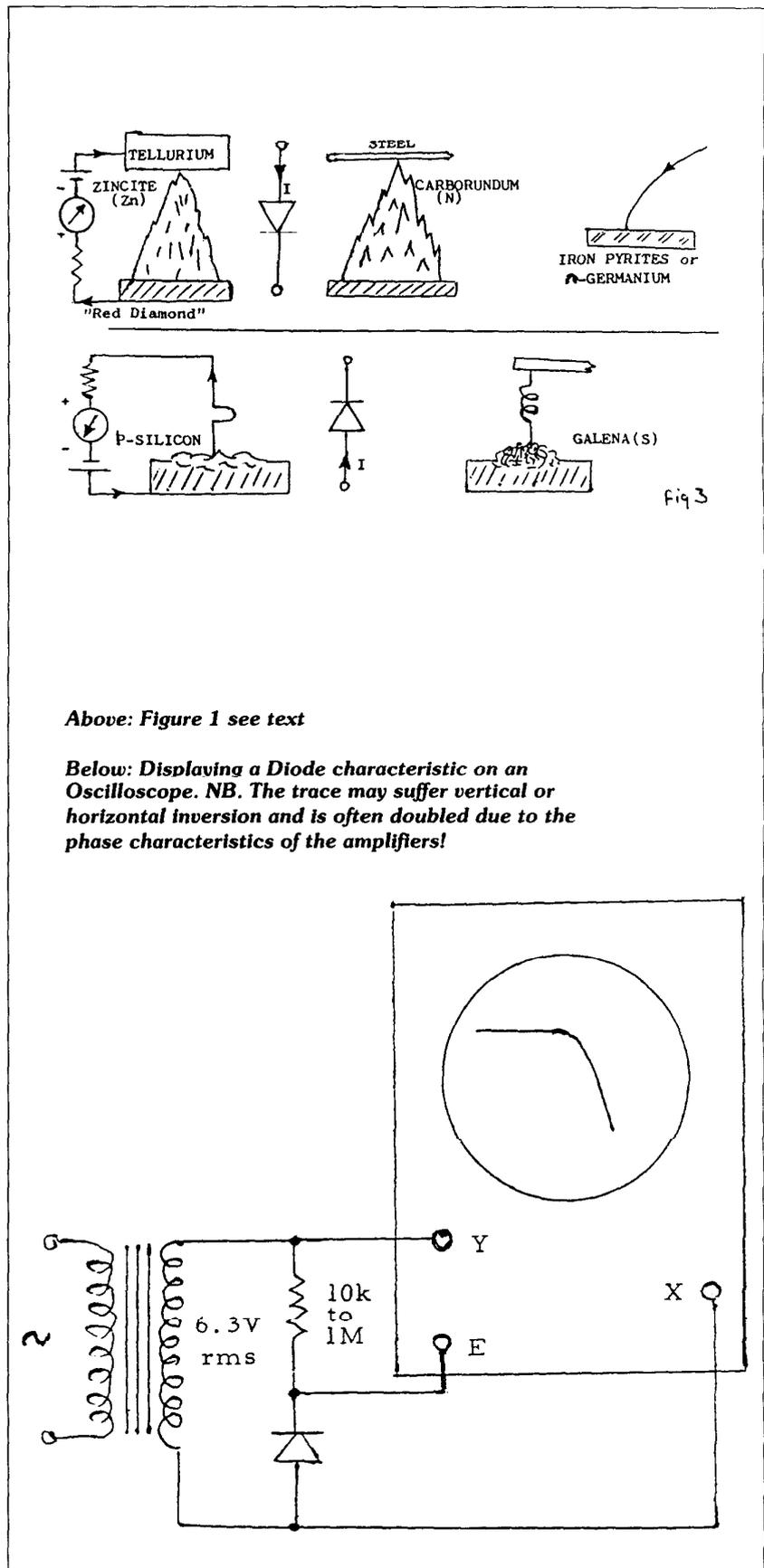


Detector development

Continued from page 74>

as does zincite if it conducts at all, iron pyrites and n-germanium. If so, they are all semiconductors containing as impurities electron donors, nitrogen in carborundum and zinc in zincite it has been suggested. Conduction is generally in the other direction in galena (which has the acceptor, sulphur, as an impurity) and in p-silicon. The diagrams (see Fig.2.) illustrate this, though in natural minerals there are often inclusions of opposite conduction.

Nature is kind to us in providing minerals with about the right impurity concentrations (Not too little, Not too much!) to provide the electrons (or holes) needed for crystal detectors, amongst a excess of material which either conducts much too well or not at all. And man-made semiconductors such as single-crystal silicon, and of course carborundum, also provide a wide range of impurity concentrations from which to select. An ohmmeter will provide a crude indication of rectifying ability for many crystal detectors, if the current is low enough to avoid damaging the "junction". If the forward resistance is less than 500 ohms and the reverse resistance is greater than 50,000 ohms then the detector is probably as good as it need be for headphone listening on strong signals. But getting it so depends upon selecting a suitable piece of crystal in the first place, setting the bulk of it securely in Wood's alloy in the mounting cup, and adjusting to optimum pressure against the crystal a compatible contact, steel for carborundum, tellurium (toxic) or bornite for zincite, or a metal whisker for most other materials. Even then, some detectors will be "more equal than others" in detection efficiency. A Carborundum Co. detector seems to require 6dB more radio-frequency power than a 1N34a germanium diode for equal audio to the headphones (both detectors biased) with a "Red Diamond" somewhere between. Interestingly, there is a "fudge factor" in junction theory to accommodate this practical variation in diode characteristics. But it's an inexplicable nuisance to the enthusiast "tickling" his crystal with the catwhisker (Fig.4) to find a "sensitive spot", rather than succumbing to the temptation to wire a diode behind the panel.



Above: Figure 1 see text

Below: Displaying a Diode characteristic on an Oscilloscope. NB. The trace may suffer vertical or horizontal inversion and is often doubled due to the phase characteristics of the amplifiers!

Avo valve tester data manuals

by Philip Taylor

Many collectors own and use the Avo valve tester in its various forms. The original two-panel version was introduced in about 1936, and the roller selector switch version a few years later. The switch enables any tester circuit to be connected to any valve pin, and was used in post war bench model characteristic meters and the suitcase model CT160 tester.

Avo published valve data books from an early date, issuing data in a common format to enable most valves with an anode dissipation of up to 25 watts to be tested. Information suiting the two-panel tester was included until 1968. The manuals were at first split up into maker's lists but most later manuals which are found now are in the more conventional alpha-numerical order.

In common with all data compilations, the Avo manuals are subject to errors. Some errors are small omissions and misprints, but selector switch errors are potentially valve destroying.

I have prepared a listing, made up from personal observations noted down over many years. A copy is available on sending a stamped self-addressed envelope to the Editor. Further corrections are invited from other valve tester users.

Another point concerning valve testing affects power triodes: for some reason, which has proved impossible to get to the bottom of, the mutual conductance for many power triodes listed is the maximum conductance. This maximum figure was traditionally at anode volts 100, grid volts zero. Looking through maker's valve data manuals will confirm this. Taking the mutual conductance figure at anode volts 100 started in the mid 1920s, at least as far as publishing the data was concerned. Avo however appear to run power triodes at their working points, i.e. maximum anode voltage and appropriate grid bias, producing maximum anode current for the average valve. Mutual conductance at this point is usually 1 to 2 mA/V less than maximum conductance, taking a

Amateur Wireless

DECEMBER 2, 1933



A NEW USE FOR SELENIUM CELLS

The Modern Infant, determined to get to the bottom of this Father Christmas legend, rigs up a ray-controlled alarm apparatus en route to the stocking

typical Power triode with a maximum conductance of 6 to 7 mA/V.

Power triodes appear to be the only triodes affected by this anomaly. Small triodes generally have the same mutual conductance at the working point as well as at Va 100, Vg 0, though it can be worth a check sometimes, taking conductance by both methods.

As far as valve manufacturers are concerned, the only one which published both mutual conductance figures for their power triodes in the 1930s appears to be Mazda. The other major makers, Cossor, GEC and Mullard all published a conductance figure taken at Va100, Vg 0.

Data for some power triodes has been included in the correction list to suit voltages available with the CT160 tester. Data has been checked using new samples of the valves concerned, and good used valves may show lower, but still valid, readings.

As usual, a valve tester will tell you everything you want to know about a

valve, except whether it will work in a radio set. The final question has to be whether the valve works and makes the equipment do what it is supposed to do.

Since these notes were written, a potentially meter-destroying error in the data manual has been pointed out by a New Zealand collector.

When testing diodes and rectifiers, the selector switch is used to connect the valves anode or anodes to D1, or D1 and D2, for half and full wave devices, to a suitable voltage supply and load resistor in the tester. Two rectifier valves in the data list, the EZ80 and EZ81, have their anodes connected to A1 and A2 rather than D1 and D2. If this setting is used when testing the valves, there is a strong possibility of the meter being damaged or burnt out.

The correct switch settings for the EZ80 and EZ81 are 8*1 23* 9**. Make sure when testing other rectifier valves that the roller switch settings includes 8 and 9 (D1 and D2) rather than 6 and 7 (A1 and A2).

Vintage page

When Mary Listens-in! By RENÉ BULL



Receiver Techniques of the 1920's

Part 11

by Pat Leggatt

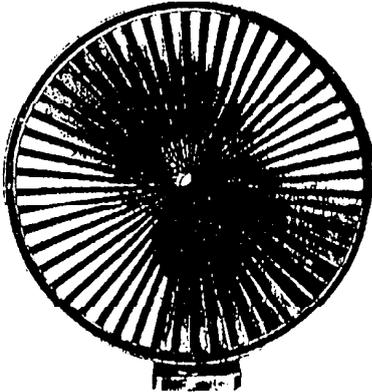
Here is number 11 of a series of short articles by Pat Leggatt reviewing the circuitry and other features of wireless sets of the 1920's. Each article will outline a particular aspect of sets of this period. Back numbers of Bulletins in which earlier parts appeared can be obtained from The Editor.

Loudspeakers

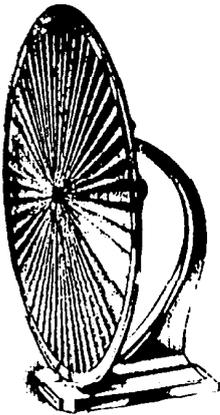
Early loudspeakers took the form of a headphone type drive unit with a horn on top. For domestic use the horns could not be very large, and hence had little response at frequencies below 200 Hz or so and exhibited marked resonances at higher audio frequencies. Furthermore the drive units were sometimes maladjusted or overdriven so that the armature hit the pole pieces on audio peaks. It seemed almost that the distortion and lack of bass response of loudspeakers made improvements to amplifiers hardly worth pursuing; or alternatively that the poor performance of amplifiers made loudspeaker development a waste of effort.

Nevertheless, improved loudspeakers of the cone diaphragm type made their appearance, the earliest being the 1923 Sterling 'Primax' using a Lumiere pleated diaphragm developed in France, originally in 1903 for gramophone use (Fig 13). From the mid-1920's more attention was given to overall sound quality, and resistance-capacitance coupling of LF stages became more common despite the higher HT required to allow for voltage drop across resistive anode loads: choke-capacitance coupling was sometimes used to avoid this voltage drop and high impedance, high μ valves specifically designed for R-C coupling could often make up for the loss of transformer gain. Advertisements began to emphasise the "purity of tone" obtainable from R-C coupling and from loudspeakers which were "The Very Soul of Music".

STERLING
"PRIMAX" LOUD SPEAKERS.
(Lumière's Patent).



No. R. 1291
Front View. Height 16½ ins. Dia. 15½ ins.



No. R. 1291. Side View.

THE pleated diaphragm of the Primax Loud Speaker is familiar to many, and its popularity is as great as ever. For reproducing the lower notes it is unexcelled, and it will fill a large room with a rich volume of sound, giving no sign of harshness or unpleasant vibration. Very strongly made and well finished in bronze shades.

No. R. 1291. Sterling "Primax" Loud Speaker.
Bronze finish, 2000 ohms £5 5 0

Figure 13

There would have been obvious advantage in mounting a loudspeaker in the receiver cabinet, but very few sets in earlier years embodied this feature. The difficulty lay in the susceptibility of contemporary valves to microphony: electrode structures were not very rigid in themselves and were not securely supported in the glass envelope, with the result that any mechanical disturbance caused them to ring like a bell. Acoustic feedback from a loudspeaker to the valves could set up continuous 'howl-round' if even an external loudspeaker was situated too close to the receiver. Spring-mounted 'anti-pong' valve-

holders eased the problem to some extent; and with the aid of these, and with careful attention to mechanical layout, one or two sets with built-in loudspeakers were on offer in 1923. But it was not until 1927 or so, when valve construction had considerably improved in this respect, that many sets appeared in this form.

At the end of the 1920's, moving coil loudspeakers started to appear for domestic applications. These of course really did justify claims for good quality reproduction, but they did not come into widespread use until the 1930's.

Reviews

Book Review

by Pat Leggatt

"The Early History of Radio: from Faraday to Marconi" by G.R.M. Garratt MA CEng FIEE FRAeS

Published by the IEE 96 pages; price £19, or £15.20 to BVWS members

Some books are boring; some are worthy works of reference; and some are a real pleasure to read. This book comes definitely within the last category.

The majority of Gerald Garratt's career was spent in charge of the Communications Collections of the Science Museum, where he earned a reputation as an expert on the history of radio. He was no dry-as-dust collector of facts and dates, but took a keen interest in the background and personalities of the main characters; thus his book comes across as an engrossing story of real people and their achievements, rather than just a technological history. Unfortunately the author died before finishing the final chapter; but luckily for us his daughter, Susan Garratt, has been able to complete it from her father's notes and lecture transcripts, and has devoted much dedicated and successful work to collation and general preparation for publication, with addition of a comprehensive index.

The history of radio from Marconi onward is well known and has often been told. Less well known is the story of the scientists who discovered

and developed the principles and techniques, although with no thought of any practical application. It took Marconi's vision and energy finally to gather it all together into a workable system of communication.

The author starts by recounting the work of Michael Faraday, son of a blacksmith with no formal scientific education, who first propounded the theories of electromagnetic fields – and even hinted, in 1832, at the radiation of electromagnetic waves. We are told how established scientists of the time were reluctant to take the totally non-mathematical Faraday seriously, but were confounded when the young Clerk Maxwell showed that Faraday's ideas on field and wave propagation could be supported by rigorous mathematical analysis.

The scene was thus set for someone to demonstrate that these hypothetical electromagnetic waves did indeed exist, and the German Heinrich Hertz came onto centre stage with his brilliant series of experiments. The author reveals most interesting details of Hertz' youth and early aspirations, including a passion for the classics and how he was nearly deflected into a career as a specialist in oriental languages.

We next hear how Oliver Lodge almost, but not quite, anticipated Hertz' demonstrations of radio waves: but nevertheless made a vital contribution towards practical radio communication by evolving the theories of resonance and tuning. There is then a brief chapter discounting the exaggerated claims by the former Soviet regime for Popov to

be recognised as the 'inventor of radio'; although the author does not deny Popov credit as an eminent scientist. Finally comes the chapter on Marconi, where we see how the young Italian was really the first to conceive how all this previous work could be harnessed into a practical wireless communication system, to the great benefit of all mankind.

This whole intriguing story is told very straightforwardly and can be read like a novel, with no mathematics to fox those of us who have forgotten what little we ever knew! The author's use of English is so lucid that one never has to stop and think "now what exactly does he mean by that?". I have spotted only one small imperfection in the book where, on page 81, it is said that William Preece has signalled across the Bristol Channel by electrical conduction through the water. I believe in fact that Preece had by then abandoned conduction and that his Bristol Channel system was based on induction, a point worth making since it demonstrates a step forward simple electric currents to electro-magnetic field concepts.

We must all have an interest in the origins of wireless and I certainly recommend the book to members, especially in view of its very reasonable price.

An order form can be obtained from the Institution of Electrical Engineers, PO Box 96, Stevenage, Herts, SG1 2SD. Tel: 0438 313311. If you want the 20% BVWS discount, you must write 'BVWS Member' on the form and get your order in by December 31st.



Feedback/Crossword

Letter:

from Douglas Byrne, curator of the Communications and Electronic Museum, Isle of Wight

Radios first home.

Following Tim Wander's story of "Radio's first home", here's an amusing story of when Marconi was operating his apparatus in the grounds of Osborne House, communicating with the Royal yacht "Osborne."

One morning, Marconi met Queen Victoria as she took her usual constitutional in the gardens, and wishing to be polite he doffed his hat and said "Isn't it a lovely morning your Majesty. I do hope you enjoy your walk."

The Queen was furious at the young man speaking to her, as etiquette commanded that nobody ever spoke to her before she had spoken to them. So she marched back into Osborne House in high dudgeon and demanded of her staff that they "get that young man off the grounds immediately." However, it was pointed out that Marconi was operating the wireless, whereupon the Queen snapped "Well, get another electrician!"

It was pointed out that only Marconi could operate the wireless, which was his invention, and in any case he

would not understand the English etiquette about never even speaking first to royalty - his mother being Irish and his father Italian. The Queen forgave him. In fact, she invited him in to have tea with her - a great honour indeed!

Letter:

from Pat Leggatt

Further to Dave Adams' reminiscences under the title "The First Broadcast Sermon" in the last Bulletin Vol 6 no 5.

From Popular Wireless of 26th October 1929:

Pop Goes the Parson

"The German village of Kleinow is about to dismiss its pastor, as a measure of economy, and replace him by a radio receiver which will deliver sermons broadcast from Berlin."

So it seems that the Rev. G. J. Jordan of Hull was right to be anxious about the effects of broadcasting!

In Popular Wireless of 6th January 1923 the following snippet appears under the heading "Radio Sermons?":

"An innovation in church concerts was made at St Thomas's schoolroom, Hull, recently, when, with the aid of wireless, a large company heard some of the concert broadcasting by a British company.

Rev. G. J. Jordan, the vicar, expressed the hope that people would not stay away from church to hear broadcasting sermons.

Answers to Crossword

- 26 So.
- 20 Iron: 22 III; 23 ITV; 24 APS; 25 Om:
- 9 Data: 13 PT; 14 Boo; 15 TA; 17 I-O:
- 4 Noon: 5 Phillips; 6 Ohms; 7 Edison:
- Down: 2 Atwater Kent; 3 Comical; 29 Television.
- 21 Eliminators: 27 ON; 28 Moo:
- 16 Captain: 18 Oral; 19 OK:
- 10 National; 11 SOS; 12 Tip; 14 Beta:
- Across: 1 Mercomphone; 8 Odium;

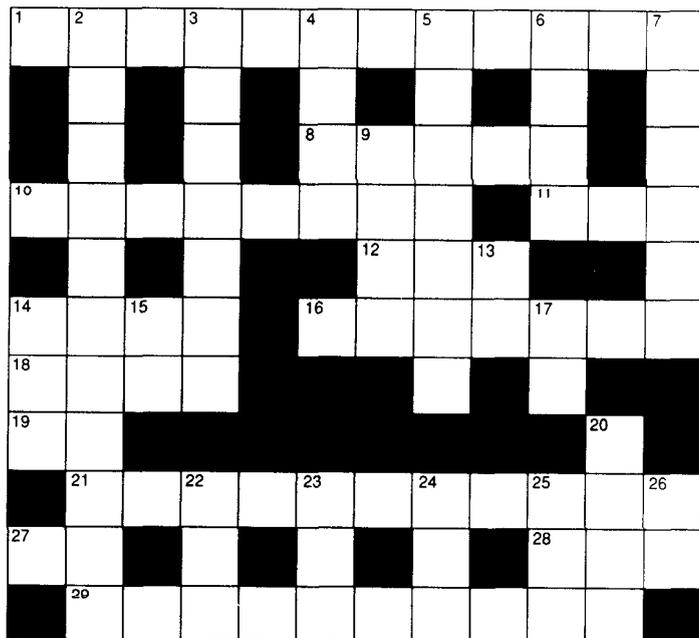
Crossword by Bob Smallbone

Across

- 1. Guglielmo, call home! (12).
- 8. Get the blame for this (5).
- 10. Not local American radio (8).
- 11. I need help with three, three and three again (3).
- 12. This part of 20 must be kept clean (3).
- 14. Greek video system (4).
- 16. We could come to panic badly by words on a picture (7).
- 18. It's like I said (4).
- 19. Not a knockout (2).
- 21. They save the batteries (11).
- 27. Switched off? No it isn't (2).
- 28. Made by 1 Across, no less, even if it sounds bovine (3).
- 29. Look into it (10).

Down

- 2. Aquatic county for this setmaker (7,4).
- 3. That's funny: there's a little microphone in the fuel (7).
- 4. High time for Ben's ding dong (4).
- 5. Not double Dutch, so only one L (7).
- 6. Severe cold kills them (4).
- 7. Alva made light work (6).
- 9. You may need this for your valves (4).
- 13. A little exercise (2).
- 14. If you don't like it, you know what you can do! (3).
- 15. Oh thank you (2).
- 17. We're switching to this. (2)*
- 20. Me, Ron the solderer (4).
- 22. You'll be sick when you get this (3).
- 23. Auntie's rival (3).
- 24. A little something to finish off with. (1, 2).
- 25. It used to be cleaner on TV (3).
- 26. Just this: exactly! (2).



*Vintage Wireless buffs accustomed to "On" and "Off" may not have noticed that these new International symbols are gradually displacing the old markings.

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Give 'your set'
a good time this
Xmas!

In the range of Marconi Valves there is the right valve for the right purpose, and a valve for every purpose, such as scientific — not feasible — designed to give unfailing performance, lasting service and absolute satisfaction.

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