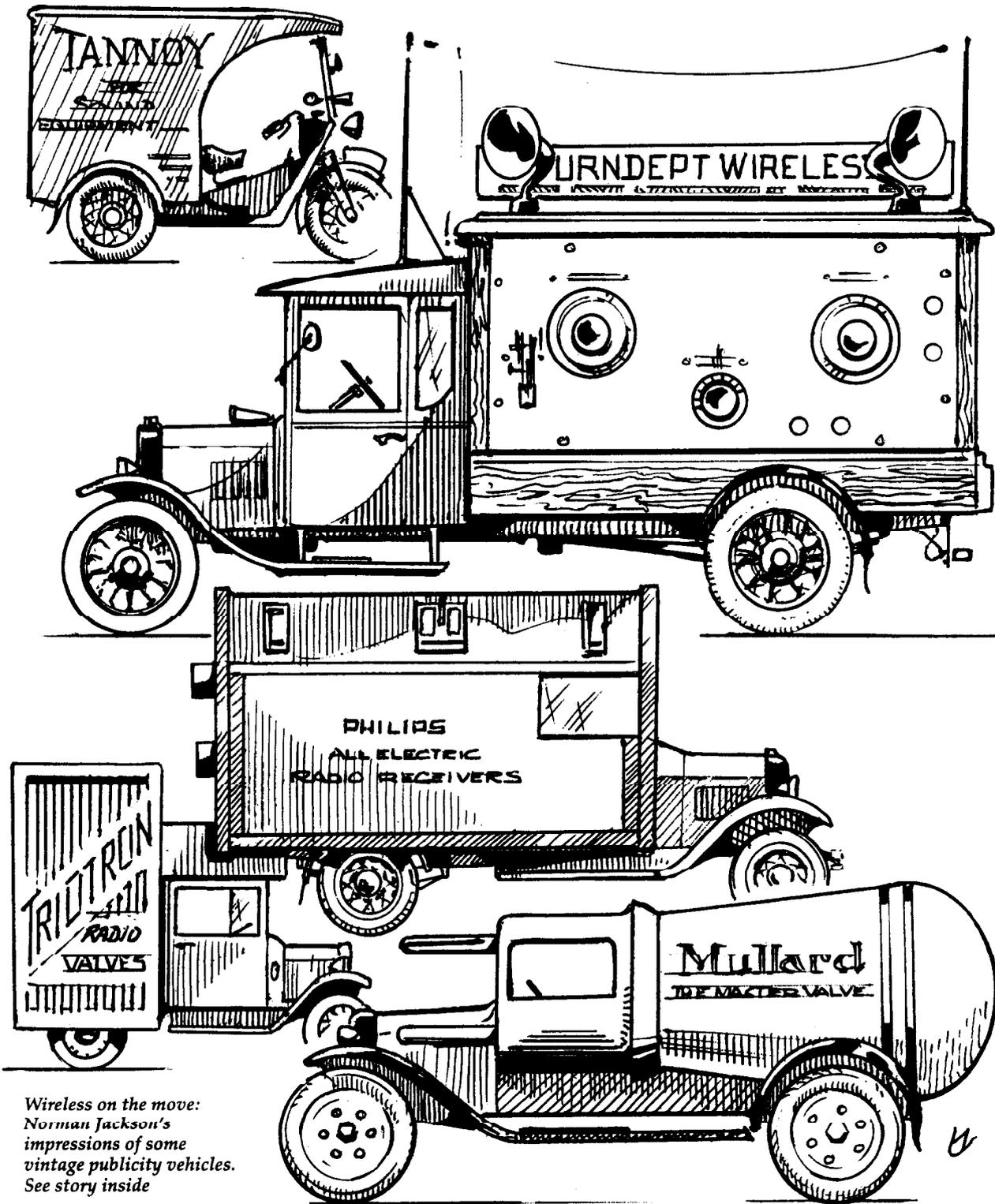


BULLETIN OF THE BRITISH

VINTAGE WIRELESS

SOCIETY



*Wireless on the move:
Norman Jackson's
impressions of some
vintage publicity vehicles.
See story inside*

**BULLETIN OF THE BRITISH
VINTAGE WIRELESS SOCIETY
VOLUME 15. No. 3**

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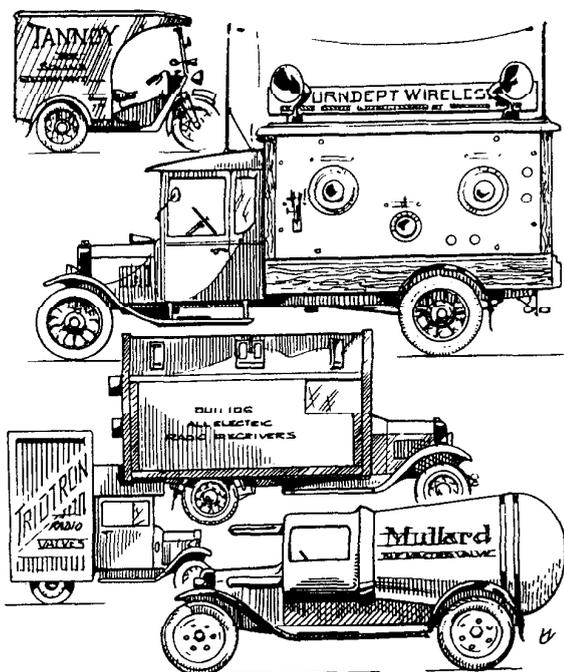
Layout and design: **Robert Hawes**
Cover drawing: **Norman Jackson**

BRITISH VINTAGE WIRELESS SOCIETY

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The exciting story of the '30s sponsored radio programmes from the continent, and how the Establishment in Britain fought to get them off the air. Illus 24p. booklet features Luxembourg Normandy, Lyons, Toulouse etc. 85p+20p pp from R. Montague, 39 Orchill Drive, Benfleet, Essex, SS7 2LS.



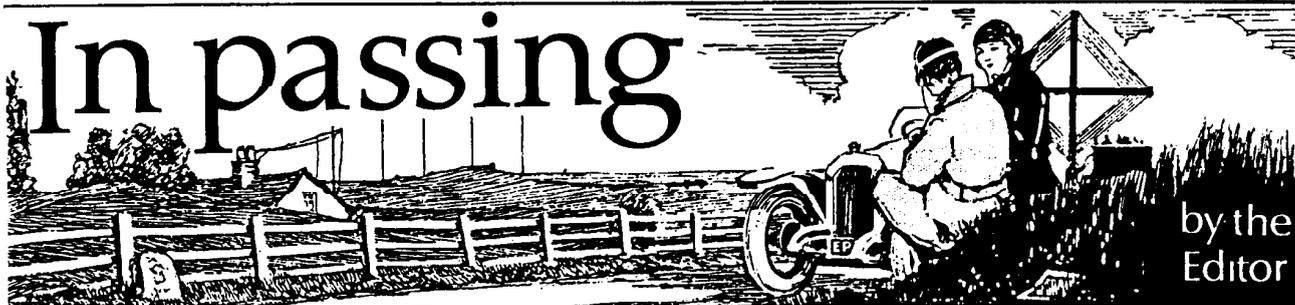
Cover story: In the late 'twenties and early 'thirties, enterprising manufacturers in the wireless industry used their delivery vehicles to advertise their merchandise. Some of them, like Burndipt's model T Ford, (pictured in Norman Jackson's drawing on the front page) even provided music on the move from a mobile receiver, fed from a rooftop aerial and relayed by horn loud-speakers. Other vehicles depicted are: (top) Tannoy's Raleigh van of about 1932; an unidentified small van with back converted to look like a Philips' Ford Model A; and Mullard's fine replica of a valve, mounted on a 1925 Fiat 505F of 1925. Readers who have other illustrations of this kind are invited to loan them to the Editor please).

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: (01) 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.

For your diary

Provisional dates have been fixed for Society meetings in 1991. Meetings at Harpenden are proposed for 16th June and 6th October. In addition it is proposed to have southern area meetings at Soughborough on 14th July and 8th September our friends at "Radiophile" tell me they have fixed swapmeets for April 14 and September 15.

Radio Time

Readers might like to know that there is now a little magazine devoted to the history and development of clocks and watches regulated by time signals broadcast by radio, which is called "Radio Time". The current issue contains articles on how the BBC started broadcasting the time and on the latest technology which has produced a wrist-watch which regulates itself by automatically tuning into a broadcast signal. The Editor and publisher of the magazine, David J. Boullin, of 51 Burford Road, Witney, Oxon OX8 5DR (from whom subscription details may be obtained by sending an SAE) is trying to locate an example of the "Horophone" crystal set, first made in 1913, which was used by watch and clock repairers into the 'twenties.

Post Haste?

When posting the Bulletin, we are always careful to include the postcodes in the hope of speeding delivery, but despite what the Post Office claims, this does not always seem to work. There seem to be curious anomalies: non-postcoded items arrive earlier than coded ones, second class beats first and distant destinations get post earlier than "local" ones. One of our members, Captain Maurice Seddons of Berkshire, recently told me how, as an experiment, a friend posted two identical envelopes to him on the same day, one uncoded and the other not. Can you guess which arrived first? Yes, the uncoded one. It took three more days for the other one to arrive.

An Orkney Museum

The unique private collection known as "An Orkney Wireless Museum" which preserves the island's local communications history and especially that of the activities there in the second world war, recently celebrated its seventh anniversary with an "Open Day" and by setting up a "special event" station. The museum, now run by a charitable trust, was founded by BVWS member the late Jim MacDonald at his home at St. Margerets Hope in 1983, but Jim died five years later before he could enjoy the fruits of his labour in retirement. His son Peter, also a Society member, continued the work and is now one of the trustees.

Bo'Ness Museum

Society member Harry Matthews, who set up a humble wireless collection in the James Clerk Maxwell Building at Edinburgh University in 1973 which was to develop into the Museum of Communications there, has had a busy time in what he thought was going to be his retirement; for the collection, having twice outgrown two sites, is still growing and planning a permanent home in Bo'Ness, perhaps in Scotland's only circular cinema — a defunct 1911 building. Highlights for Harry in the last six months have included being presented to the Princess of Wales on her visit to the museum at the University; a visit from Chinese museum directors who presented him with an award and many touring displays, especially for children. As well as running the permanent exhibition at King's Buildings, Edinburgh University of which he is Curator, Harry is also busy with Bo'Ness Heritage, which runs a steam railway and an industrial museum and is now reconstructing a 1920's village. These activities show his wide interests, as does the Communications museum where exhibits range from telephones, typewriters, television and telegraphs to wireless-sets, wire-recorders, Wimshurst machines and wind-up gramophones. An independent and unfunded collection, it welcomes donations of artifacts, books, data and practical help.

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Irish Society

The Irish Vintage Radio and Sound Society has had a busy time since its formation, only a year ago, organising small exhibitions which have created a good deal of interest and new members. For the winter season they hope to organise lectures, a swapmeet, repair and restoration classes and perhaps a repair service for members who are non-technical. Details can be had from Vincent Farrell, 39a Lower Drumcondra Road, Dublin 9. Please send an SAE.

In Passing news and comment, continued

Chairman's notes:

New Treasurer: As noted in the last Bulletin, Desmond Thackeray has been succeeded as Treasurer by Alan P. Carter, subject of course to ratification at the October AGM. Desmond took over as Treasurer in November 1985 and it is nice now to repeat our appreciation of his four years' work keeping the Society's finances in apple pie order. In addition he has kept an eagle eye on the correctness of the membership records which I maintain on my computer; and I have many times been grateful for his spotting of the errors which I make on occasions.

Alan P. Carter — we have to include the 'P' to avoid fellow member Alan G. Carter being inundated with cheques which he couldn't spend — has fairly recently retired as a senior engineer with BBC's Transmitter Capital Projects Department. He is a long-standing BVWS member, with a collection which is notable for the meticulous standard of his restoration work. He also has a comprehensive collection of valves, on which subject he is very knowledgeable. Alan will certainly ensure that Society money is used wisely for the benefit of us all, maintaining the high standards set in earlier years by John Gillies, Ian Higginbottom and Desmond Thackeray.

Honorary Member: It was with great pleasure that the Committee recently resolved to offer Honorary membership of the Society to our Editor Robert Hawes. It was unanimously agreed that, as Bulletin Editor and Harpenden Organiser, Bob does more than anyone to further our interests; and I am sure that all members would wish to join me in welcoming this recognition of his work.

— Pat Leggatt

Information Officer's Report

Register of Members' Interests: Thank you to all of you who have sent in forms and letters. I am sorry I cannot reply individually but assure you all that your comments and suggestions have been noted. If, in due course, they do not seem to bear fruit I invite you to enquire. And thanks to those who also reported on GPO numbers. Our master list, which is being maintained by Pat Leggatt, is growing. Thanks also to you who have sent details of your collections. They make fascinating reading. (This, by the way, is entirely optional and is not connected in any way with letting us know your particular interest.) Your efforts have already borne

Great Wireless Bores of today number 5 "Wally Wangle"

Wally is an ordinary sort of chap who has a somewhat sketchy knowledge of wireless but has pretensions of grandeur. He attempts to wangle his way into the grandiloquent, high-Society circles of the *Technical Literati* by employing words and phrases he doesn't quite comprehend. Not so much a name-dropper as a term-twister, he hopes to make himself acceptable in circles which he feels might otherwise reject him. A sufferer from severe malapropism ("I've just bought this lovely crystal-set: it's a BTH Bidet") he requires sympathetic treatment, for he's not a bad bloke really, just a bit insecure. If only he would admit his limitations and if only others would accept that we all have gaps in our knowledge, Wally would feel much more at home in the world of wireless.

fruit, even before the publication of the list you will find in the Newsletter, which Ian Higginbottom compiles. There is a wealth of knowledge and expertise within the Society. In this first instalment, I have chosen those with interests that are specific, as distinct from general. Most of us, I know, could only describe ours as 'general'. Subsequent lists will include this category. The point of being in the list is to indicate a wish to contact other members.

Please use me as a channel for any kind of query. I am fortunately placed in having ready access to Gerald Wells' Museum archives (and, of course, his own encyclopedic knowledge) and I am in the position of being able to say, 'I know a man who does'. — Dave Adams, 69 Silver Lane, West Wickham, Kent BR4 0RX.

American guide

Trader Harry Poster of USA is offering his "1990 Price Guide to vintage televisions and collectable radios" at \$10 (\$14 airmail to Europe). It has 25 pages and features catalin, bakelite and mirror radios, some of which now sell at hundreds — even thousands — of dollars. It can be obtained from Sight Sound Style (a quarterly newsletter on the subject), Box 2224, South Hackensack NJ 07606, USA.



What is it?

This picture has been sent to the Editor by Douglas Burne of the Isle of Wight wireless museum. The glass envelope is reminiscent of Cossor "P" type pip-top valves of the early twenties, but not the pins nor the curious internals. What was it for?

Battery Eliminator: Maurice Steadman, a member of the Society, has designed a power supply giving 2 volts LT and 9 volt GB suitable for use with an HT supply such as is given by a vintage "Battery Eliminator" (he has built his design in an old eliminator box to match a complete one). The design uses modern components and circuitry. A copy of it may be obtained by sending an A5 SAE to the Editor.

The Weather and your wireless

by David Read

Pioneers in wireless telegraphy had noticed before 1900 that lightning causes interference in reception. These early pioneers called this unwanted noise "atmospherics", and soon believed they could use it to tell the nature of future weather. Weak cracklings preceded frosts or temperature falls. Cold-front thunderstorms signalled their approach with violent cracklings. Hail storms produced a slight hiss.

Amplitude-modulated (AM) radio circuits pick up storm generated static. A cheap transistor radio, especially one with a ferrite antenna makes a good detector of atmospherics. This kind of antenna is highly directional, so the source of static can be located by turning the radio. Tune the radio to an empty spot on the low end of the band and turn up the volume. Faint cracklings are a sign of good weather; definite crackles mean that electrical activity is several hours away. As the storm approaches, the crackling increases. The high side of the AM band produces less crackling than the low side, but when the storm gets nearer, the amount almost equals that of the low side.

The electrically charged layer above our atmosphere is known as the ionosphere. During daytime, solar radiation excites particles, and the ionosphere drops. At night, it rises and becomes a reflector of radio signals. It is for this reason that distant radio stations begin to crowd into the AM band after sun sets, while many small, local stations sign off for the night.

The early ham-radio operators found that the state of the sky made a big difference in how far they could receive and transmit. Several studies produced the following results:

Sender and receiver in cloudy area: good transmission 83% of the time. Sender cloudy and receiver clear: good transmission 83% of the time. Sender and receiver in clear weather: good transmission 46% of the time. Sender clear and receiver cloudy: good transmission 46% of the time.

In the 20's Physicists in West Virginia found that the nearby Morgantown radio station could be monitored and used to give accurate weather forecasts. Since the signal bounced off the ionosphere, this meant the electrical layer must be influenced by

"The weather will remain fine for the next twenty-four hours — if there is no change"

— from an early 'twenties picture postcard.



or be influencing, the changing atmospheric conditions.

The signal intensity of the radio station was plotted against the coming weather. It was found that an increase in signal strength meant cloudy weather, and a decrease indicated better weather. If the night-signal strength rose for several hours and then fell, it meant that the morning would be cloudy, and the afternoon would be clearing. During February 1929, the forecasts were 90 per cent accurate and only one was wrong. During March they were 88 per cent accurate, with 3 wrong forecasts. This method provided forecasts for future weather on a short term basis that were more accurate than those of the broadcast weather forecast.

Further radio detective work was done by Father Ernest Gherzi in China. He sent a 6 Megahertz signal from an ordinary radio transmitter just after sunset and just before sunrise. The length of time it took for the signal to return indicated which ionosphere layer had bounced it back. A signal returning from the E layer meant maritime air with overcast and rainy weather. An F-1 layer return meant cold, dry Siberian air was over the area. A return from the F-2 layer meant that a warm, tropical air mass was present.

Radio signal weather forecasting was subsequently neglected, but used again during World War II. There was

a 7-mile long plant at La Porte, Indiana, which produced shells and bombs. Because of the danger of explosions, the plant was shut down during thunderstorms. Radio static was monitored every half-hour, and as electrical activity increased, the plant was shut down in sections.

This led to the idea that official weather forecasts could be made using radio receivers, and a serious attempt was made in England after World War II to set up a radio network to improve weather forecasting.

A circuit that detects and plots atmospherics was written up in the March, 1959, issue of Scientific American. When measurements of electrical activity in the sky were combined with wind and barometer readings, nearly every forecast was accurate. In the Midwestern states of the USA, banks of cumulus clouds build up on many afternoons. They usually dissipate with the setting sun, but they can turn into good thunderstorms. The atmospheric detector reliably forecasts storms at a time when the weather bureau was only 50% accurate on its afternoon predictions.

The next time you listen to a weather forecast remember that your radio might provide as good or better indication of the weather to come!

References: Scientific American 1959; Radio Transmission and Weather by A. H. Taylor; Proceedings of the West Virginia Academy of Science 1929 — The effect of weather conditions of radio reception; Physical Review 1914.

Workshop

A "battery" for small portables

by Martin J. Loach

A small, "All Dry" Semiconductor Battery based on Ray Whitcombe's Inverter Design (Vol. 13, No. 3). A novel way to use the inverter design to pose as small original HT and LT batteries in your set.

For some time I have been considering the design of a small inverter to provide HT from an LT source in "all dry" battery portables, commonly requiring 1.5v and 90v supplies. I had already built one based on a larger 100 w inverter intended to provide 240 v from a 12 v battery. Scaling down and operating in reverse was the theory, but in practice some problems were found. Although these could probably have been overcome with time, Ray's design seemed to be a better bet, especially as my design would have required at least 6 volts, but Ray's only 2 V?

The specification for my version was slightly different from Ray's.

The whole circuit must fit into a box no bigger than an Ever Ready B101 67.5v battery. This is the smallest HT battery I have so far encountered and therefore would fit all my sets, even the Marconi P20B! The internal size of this battery is 67 x 31 x 84mm! Thus the size of my version would have to be much reduced from Ray's B103. The layout explained here will fit into an empty Ever Ready B101 box!

The inverter must be capable of providing up to 90 v for all sets.

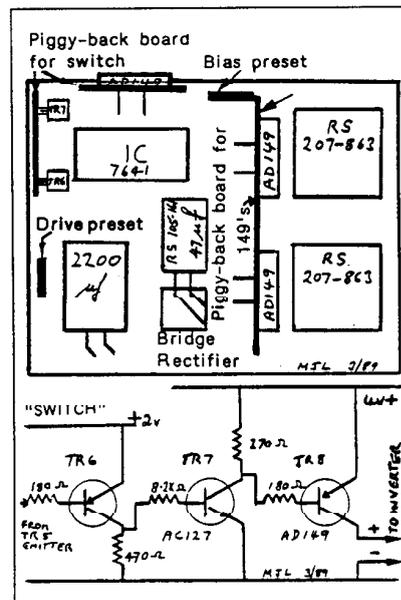
The provision of an automatic switch, working from the presence of a load, was also vital.

Construction details

I was prepared to concede that the LT supply would have to be in a separate box, with an interconnecting lead. Again the maximum size was the smallest LT battery I use, the Ever Ready 1.5v AD35. Although this was used, it would not fit in the P20B, but more of that later!

The whole thing is constructed around a piece of veroboard of the maximum size that will fit into the box.

The first major component to reduce in size was the transformer. A 1 watt version should in theory be adequate. The smallest RS transformer with the required voltages and rating is the RS



207-863. This is very small and will just fit nicely on one end of the board with plenty of room to spare for everything else. In fact two were fitted side by side, working in parallel, for maximum efficiency and minimum impedance.

Most of the circuit was unchanged in principle. However the BD136 drivers were omitted and the AD149s driven direct from the IC (IC1). The most efficient frequency for my transformers was found to be 50Hz, thus the capacitor on the feedback from pin 1 of IC1 was changed, from 47 to 0.47 μ F. In order to drive the AD149s from IC1, 270 Ω resistors were inserted into the base circuits. To get the required output voltage the LT had to be increased to 4v. This was no problem since two 2v 2.5AH Cyclon batteries fit into the AD35 case, and the capacity of this size of battery is quite adequate for at least 2 hours use. The current drain in operation is around 750 mA. A centre tap is used to provide 2 volts to the regulator transistor for the heater supply. 5 Amp fuses were included in the case of the AD35 for safety.

The two boxes were connected by the use of a flying lead from the HT battery which plugs into the AD35.

1N4148 diodes were substituted throughout, except for the bridge rectifier where 1N4002s were used. The smoothing was changed to just one reservoir electrolytic of 47 μ F, 100 v, which is a very small component, RS part 105-161. As zener diodes with a breakdown voltage of around 100v are available, these could be used to prevent overvoltage.

The AD149's fit in quite well tight up

against the transformers, sideways on a 'piggy back board', as indicated in the layout diagram.

Finally, the automatic switch was designed. Since up to 4 volts were available, the AD149 type could be used again as the actual switch for the HT generator. This is driven by the AC127 (TR7) which will operate in correct phase with the 2 volt swing obtained from an AC188 (TR6) connected to the regulator AC127 in Ray's circuit (TR5). The quiescent current when 'off' is around 250 μ A. This will in theory take 10,000 hours to drain the Cyclon cells, in other words over 1 year. This was felt to be acceptable and in any case was longer than the cells would hold their charge. In fact, original dry cells, particularly the LT battery, would probably have not had a shelf life which was any longer!

The AD149 (TR8) was mounted on its own on another piggy back board, and the rest of the solid state switch circuit was mounted on a third piggy back board on the end of the main board.

The final problem was to find a way of accommodating the sockets for the radio battery plugs most commonly found. The solution was to use a small box on the end of fly leads from the B101 box. The box used is a BT screw terminal plug box, RS part 470-320. This is just big enough to take three types of sockets (with phone plug removed!): the two pin and three pin versions of the AD35 and B126 respectively, and the small four pin of a combined battery such as B141. These batteries are often used in small sets where space is important, and the BT plug box is not too big for them. Other sockets such as the combined B136 or the wander plugs of larger sets are no problem; there is then plenty of space to use an adapter if required.

The Marconi P20B was a problem. This would not take an AD35 box. The solution was to use another pair of Cyclon batteries not in such a box, for which there was just room.

There are other variations in the battery sets which need a mention. There are different heater currents to contend with; adjustment of the heater dropping circuit may be needed. Also the battery/mains type usually use 7.5v heaters. Since these can be authentically used on mains directly, their use on batteries is not so important, but of course the inverter could be redesigned to cope with this situation.

Could I point out one other error in the original article. The link drawn as shorting pins 1-2 on the IC should be removed.

Readers wishing to have a photocopy should send an A5 SAE and 30p stamps to the Editor, 63 Manor Road, Tottenham, London N17 0JH.

Philips 634A: not so super inductance

A groan from
Pat Leggatt

Many collectors are intrigued by the Philips Superinductance 634A of 1933 and some, I believe, regard it as an outstanding engineering job.

There is no precise definition of good engineering, but it might be agreed that the following points should be included: (a) Requirements should be met with just a small margin for production spreads and ageing, (b) Design should aim for maximum economy of resources such as materials, production costs and time, (c) Design should offer reasonably economic serviceability of the finished product.

A 634A recently came my way needing restoration and I must agree it is interesting, but largely because it is a notable example of bad engineering on the above criteria.

To begin with, the basic concept is wrong. To undertake, in 1933, production of a TRF receiver to match the performance of a superhet was a very ill-judged engineering decision, when a superhet configuration could have given performance at least as good and at appreciably lower cost.

The 634A incorporates four valves plus rectifier, no fewer than a superhet would require. To achieve adequate sensitivity and selectivity, without reaction, two pentode RF stages are employed, with four ganged tuned circuits. Since all pre-detector amplification is at signal frequency, quite comprehensive screening and decoupling is needed to maintain stability, all adding to production cost.

The admittedly satisfactory performance of the set is usually credited to the tuning coils, to which the name 'Superinductance' refers. They are wound with Litz wire on 2" diameter glass formers, splendidly low-loss in the minds of the enthusiasts; but the windings are all smothered in a thick layer of glossy wax, so perhaps the inductors are not all that 'Super'. In any case the good sensitivity and selectivity of the receiver are only what might be expected from two RF stages and four tuned circuits, with



little need to ascribe any very magic properties to the coils.

Unusually for a TRF set, AVC is included and this of course would be a good feature — if it were effective. But despite the AVC, the designers found it necessary to provide a manual 'sensitivity' switch to apply increased negative bias to the RF stages when strong signals threaten overloading. Furthermore it seems that the initial design may have overlooked the fact that the 'Q' of the four signal-frequency tuned circuits — and hence the sensitivity of the receiver — would vary appreciably over the tuning range. An expensive bodge has been necessary in the form of variable RF stage bias derived from a specially constructed potentiometer driven via a phosphor-bronze belt from the tuning spindle. All in all it does not seem that the AVC is capable of doing much of a job.

Examination of the circuitry reveals a number of eccentricities and redundant components which one can imagine could have been dispensed with. It would be tedious to detail these, but worthy of mention is the RF filter in the detector audio output circuit. Where most designers would be content with a simple series R/shunt C combination, Philips opted for an expensive two-section HF choke with condenser to earth from the junction point. The second section 'sees' only a series resistance of 50k Ω with no capacitance to earth apart from wiring strays, so one wonders whether this section of the filter serves much useful purpose.

Turning to mechanical aspects, the construction and layout show the disregard of good production

engineering typical of Philips sets of the period. Mechanical assemblies are often clumsy and expensive, the 4-gang tuning condenser and the complex slow-motion drive being particularly remarkable examples. Accessibility for dealing with faulty components is as usual very restricted: thorough cleaning of both sides of the wavechange switch travellers, for example, requires much of the surrounding wiring and screening arrangements to be dismantled.

To reduce losses and unpredictable inductance variations in the famous coils requires screening cans over 3" in diameter. For no very apparent reason the cans have soldered seams which must somehow be undone to gain access to the windings, as I needed to do in one case to repair an open-circuit connection.

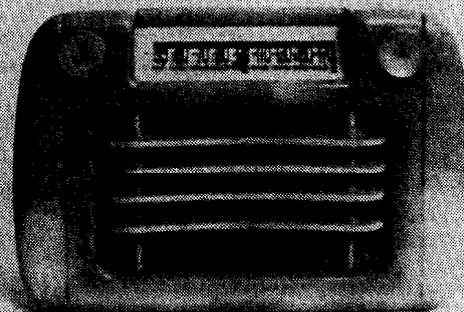
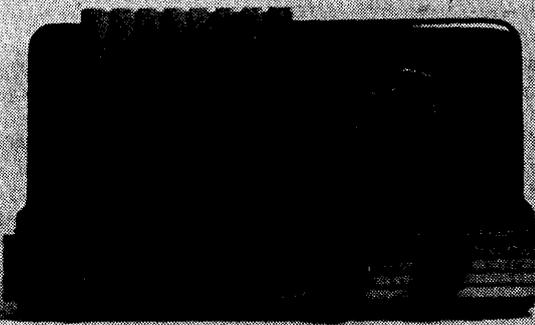
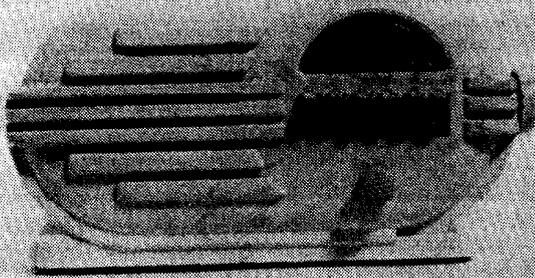
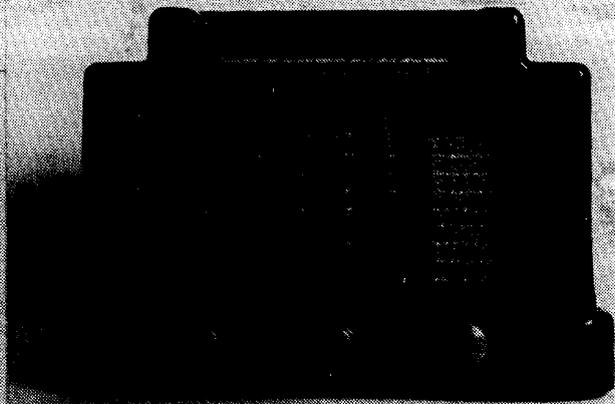
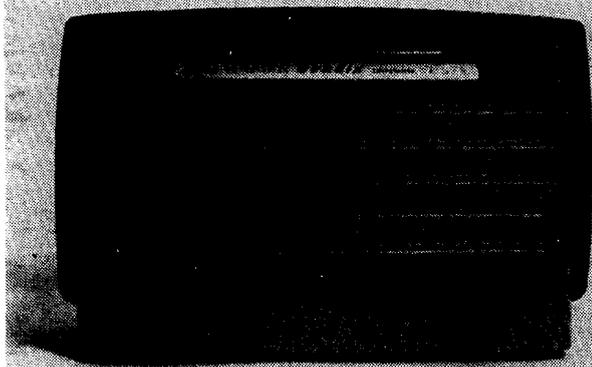
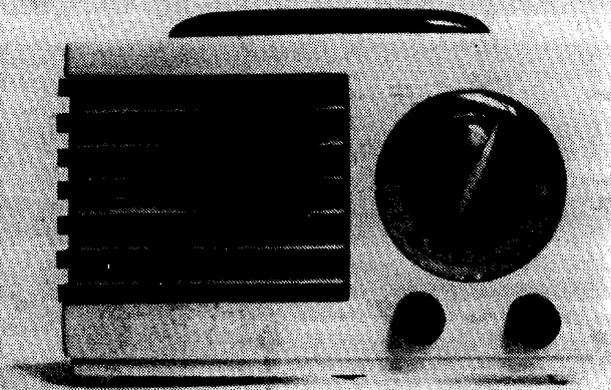
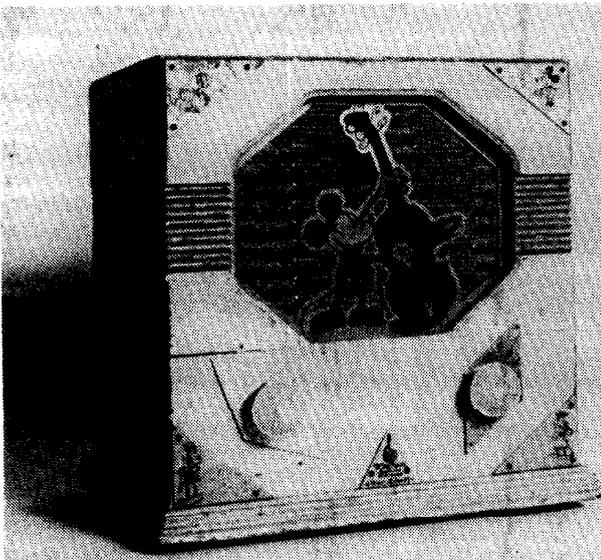
Nine decoupling condensers are grouped together in a steel box, also with soldered seams. These are paper condensers impregnated with wax; and no doubt Philips thought the wax and a hermetically sealed casing would make them everlasting. But they overlooked the fact that the wax (organic?) might decompose with time, which indeed it has done to the extent that all these condensers in my set exhibited severe leakage and had to be replaced. Having with great difficulty opened the box and extracted the old condensers, I found that even the fibre washers round the external soldering tags were markedly conductive and had to be removed and de-waxed!

The detector HF choke also had an open-circuit connection. This component is contained in a large screening can the size of a half-tin of baked beans, but fortunately the seams were not soldered in this case.

To show that I am in no way biased against Philips (!?) let me say that I do not blame them for the fact that I had to remove the loudspeaker cone and clear the gap of accumulated rubbish: no one sealed off their speech coils in those days. And to end on a genuinely positive note, it is to Philips' credit that every one of the resistors I tested (carbon film on ceramic tube) was within 10% of its nominal value; pretty good after nearly sixty years! The only one I had to replace had been burnt out by a shorting decoupling condenser.

References: A description of the 634A was given by John Gillies in Bulletin Vol. 1 No. 2. In the accompanying circuit diagram there is a minor error in that R20 should be connected to the junction of R16/R17, rather than to the junction of R16/R4. The 634A, and other sets in the 'Superinductance' range, were featured in a more recent article by Geoffrey Dixon-Nuttall in Bulletin Vol. 8 No. 4.

Round the collections



The art of radio

Robert Hawes

An increasing number of vintage wireless enthusiasts are becoming interested in the external design of radio sets as well as "the works", particularly in objects which are lately being defined under the portmanteau term "Deco". Strictly speaking the term "Art Deco" from which it is derived, refers to a style which began with a Paris exhibition of 1925 and lasted only into the early 'thirties, but since then, "Deco" has lumped together almost anything which people consider "modern" from exotic glass femmes-fatales to 'sixties chrome teapots. Radios are included in the genre, ranging from the mid-thirties round Ekco to the post-war Pye "Sunburst", but the sets which most attract collectors are the brightly-coloured, plastic, American midget and novelty sets of just pre-war and just post-war; a period regarded as a "Golden Age" of imaginative design more or less ending with the austerity of the second world war.

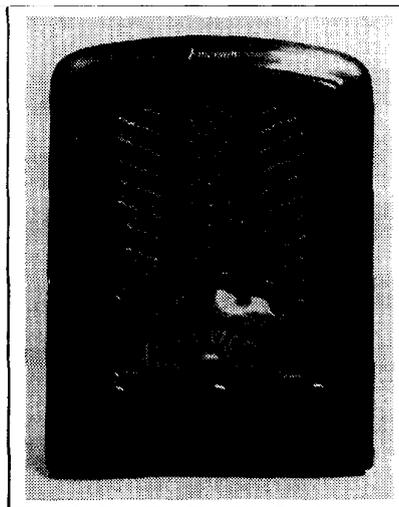
The attractiveness and technical interest of these sets is mostly skin-deep, for they were often built down to a price and were hardly innovative in circuitry and construction. But the cases were made from plastics which are never likely to be used again, some hand-made and hand-polished to produce a beauty which would now be impossible to match on an industrial basis. Today, they are rare in the UK although they were imported in fair numbers. It seems they did not, in those days, appeal to conservative Britons, who preferred good solid, brown wooden boxes and regarded anything made from plastic as a "cheap and nasty" imitation of the "real thing". They are anything but cheap these days, often costing a thousand pounds or two apiece; and few people would regard them as nasty, except in respect of their "works".

One Society member who has a special knowledge of sets of the period is Gad Sassower of London,



Above: Gad Sassower with some of his sets and below, his favourite a 1938 green "marble" Emerson "Tombstone".

whose fascination with them stems from his interest in art and design, which must have something to do with the fact that his parents, Gabriel and Renate Sassower are both architects. Gad acknowledges that there are elements of both architecture and sculpture in many "Deco" objects and he is fascinated by their beautiful colours as well as their shapes. The materials from which they are made are synthetic but seem almost to be like natural "living" substances which change with time like other antique objects which develop "patina". Gad reckons people are getting tired of "Japanese black boxes" and yearn for beautiful objects in their homes — a notion which set him off on an enterprising and successful radio business venture a few years ago. He has a collection of radios at his home, but much of it can be seen at his stylish shop in the prestigious "Mall" antiques centre in



Camden Passage, Islington, London, where he has assembled a carefully-chosen and quite delightful selection of radios and other objects of "Deco" style in plastics and metal.

Photography:
Paul Straker-Welds

Book Reviews

Book Review

by T. C. H. Going

How a bright spark met resistance

Eisler, Paul — *My Life with the printed circuit*. Cranbury, N.J. (USA) and London (GB): Associated University Press — Lehigh University Press. Price £14.95. ISBN 0-934223-04-1.

This is a most interesting book, especially for historians of technology and anybody concerned with the fate of inventions and the politics of research, development and industry today.

You might suppose that anybody who arrived waving a patent and saying "Now you can forget all those hand-wired joints, this is how to print yourself a radio set" might be on to a winner. Not so; and this illuminating book covers in detail the many setbacks which beset Paul Eisler on his path.

Eisler was born in 1907 in Vienna, an inauspicious time and place to be Jewish, with little chance, after university, of a job. Following a brief period of work with the HMV agent in Belgrade, curing interference problems on piped music systems on the railway, he joined a Social Democratic publishing house "Vorwärts" which produced a radio weekly, "Rundfunk". Here he became intimately acquainted with the technique of printing, which was to serve him well later. After the Fascist putsch of 1934, he needed to escape from Austria. Fortunately he had two patents to his name, one on sound recording which secured him an invitation to visit British Thomson-Houston in Britain, and the other on stereoscopic television methods he managed to sell to the Marconi company.

Thus, at a stroke he was assured permission to enter this country, and, more fortunate than many of his fellows, to escape imminent starvation and worse. Once here, he was not permitted to take a job which could go to a Briton, and he had to find a way of supporting himself from his small room in Hampstead. In earnest he studied printing in the British Museum Library, and in 1936 applied for a patent on his "Printed Circuit". Laboriously he glued up a board with copper strip, for a small working radio and took it to Plesseys for evaluation. No luck — "Girls are cheaper and more flexible".

Following this setback, he worked as a one-man research and development section for Oscar Deutsch's Odeon Theatres group and assisted with the introduction of the remarkable Scopphony large-screen television system, until the war put paid to this. Eisler became deeply convinced that his printed circuit could be a key to breaking Hitler's Germany, and he worked hard on developing it. He nearly got his lucky break with one financier — but this man had to choose from two projects, and probably justly selected on Frank Whittle — and the jet engine. In 1941 he signed away his printed circuit board patent for just one pound and became an employee of Henderson & Spalding (Technograph Ltd.). By 1943 he had perfected the etching technique as we know it today, and had prepared twenty four chassis for distribution. The Ministry of Supply and the heads of missions were just not interested. However, Eisler had the satisfaction that the National Bureau of Standards of America did take up the idea; the proximity fuze was the outcome and more than 4,000 doodlebugs destined for London were destroyed thereby. This was Eisler's moral reward.

In the meantime, Eisler was not spared some of the tragedies affecting the rescue of his nearest and dearest from Austria. After the war, things began to take off, but not greatly to Eisler's financial advantage. The story of the appalling behaviour of British firms of household repute is a little shocking, and in many ways the later parts of the book are the most interesting for the insights they afford. Printed telephone exchange wiring was killed stone dead by the manufacturing cartel. The United States patents were comprehensively infringed by US industry which had no intention of paying a bean. The patent position in Holland and Germany was not properly secured. The heating-film development for aircraft de-icing largely foundered on bureaucracy and the bullying tactics of firms like Dunlop. Finally the British Government NRDC — the National Research & Development Corporation — came into the picture, the "Kiss of Death" as Eisler puts it. Our author's life has been long and inventive; the insights into why the lone inventor's life so rarely works are most valuable and should be more widely read, and he seems surprisingly lacking in bitterness, taking pleasure in the universal acceptance and establishment of his techniques.

This book is very readable, though there is a slight impression that it was written over a period of time and that minor irregularities might have been cleared up. There is a list of patents, but the number assigned to the key patent of 1936 is not of the correct form — maybe it was only provisional. There is also a full bibliography and useful concluding notes from Dr. Mairi Williams. Dr. Eisler's other tome "The technology of printed circuits: The foil technique in Electronic Production." (1959) London: Heywood & Co. and New York: Academic Press, remains a classic.

Tungram Valves

Of topical interest is the fact that (American) General Electric, Inc. (GE) has recently taken a 50% stake in the Hungarian company Tungram. Before the war, Tungram were a well-known manufacturer of valves. They had factories in several European countries, and in 1934 opened their factory in London, in West Road, Tottenham. They produced an extensive range of types, including all the important American, Continental, and some British valves, either directly numbered or as equivalents.

This might seem puzzling, unless you knew that they were partly-owned by — yes, you've guessed it — American General Electric. According to one reference, they were only 17% Hungarian-owned, the rest being made up thus:

- 55% — GE of America and RCA
- 13% — Osram of Germany
- 10% — Philips of Holland
- 5% — GEC and BTH, Britain

What a small world! And how cosy when it comes to patents, prices and competition.

—Tom Going

Ref: BIOS Report No. 248: The radio valve and lamp industry in Vienna London: HMSO (ca. 1948).

What's on

Readers may like to know that the book "What's on the Wireless" by Society member David Lazell, an affectionate recollection of popular programmes and broadcasters of the early days, is still available. It can be obtained at £7.95 including postage from Evergreen Books, PO Box 52, Cheltenham, Glos. GL5 1YQ.

Book Reviews

Book Review

by Robert Hawes

Impressive

"Radios von Gestern" by Ernst Erb. Hardback A4 size. 118 Swiss Francs including post from the publishers M + K Computer Verlag AG, Postfach 1401, CH-6000 Luzern 15 Switzerland.

"Radios of Yesterday" is described as "the best book on the subject" and in many respects that is certainly so: its sheer size, historical scope, illustration and comprehensiveness is immediately impressive.

The book is likely to become a "Bible" for collectors in Europe, where its German language text will be acceptable but this will be a disadvantage to British enthusiasts who happen to be mono-lingual and it is hoped that an English-language version will eventually become available. That said, it must be pointed out that this sumptuously produced 2-kilogram, 500-page parcel of goodies packs in a lot of visual appeal: a thousand illustrations ranging from old etchings and historical diagrams to 600 black-and-white photographs of radios and a superb 16-page colour section. The illustrations are so clear as to be fairly self-explanatory so that with a translation dictionary and a bit of patience even readers without any knowledge of German will be able to glean quite a lot from them. Along with German, French and other continental things illustrated are British and American made sets, some of which may even be unfamiliar here.

Ernst Erb of Switzerland must have undertaken a prodigious amount of research in producing a work which is much more than a mere collectors' book. He traces the history of the subject from the beginnings of discoveries in magnetism and electricity to the transistor, showing the stages with some fascinating illustrations; there is a large section on valves complete with data, drawings of bases and photographs clear enough to show electrode assemblies. There are also separate essays on historical developments in various countries; sections on repair and restoration work, useful lists, details of the work of radio-amateurs, a description of early television, and even a section on how to photograph objects.

At around £60, the book is unlikely to be on every British collector's Christmas list, but compared with some of the highly priced books now being produced for the library and



university market which are sometimes of little academic importance and of no interest to the average enthusiast, this is good value for money.

You can obtain an explanatory leaflet and order form for the book by writing to M + K Computer AG, Postfach 1401, CH-6000 Luzern 15. Despatch is prompt.

Book Reviews

Book Review:

by Robert Hawes

Hot Air

"When the Ovaltineys' Sang" — a salute to some intrepid broadcasters of the 1930s by Ron Montague from whom it is obtainable, price 85p plus 15p postage, at 39 Orchill Drive, Benfleet, Essex, SS7 2LS.

In his amusing and most-interesting home-produced 28-page booklet, Ron Montague, Chairman of Southend United Nations branch, tells how in his schooldays in the 1930's he tuned-in with millions of others to the lively programmes which were beginning to be beamed to Britain from what were then to most people romantic-sounding places like Luxembourg and Normandy, unaware of a battle that was going on behind the scenes.

This extremely entertaining booklet reminds us that when excited Britons began to listen-in to chatty disc jockeys and advertising jingles from far away places, alarm bells began ringing in the ears of Auntie BBC, the British Establishment and its Corridors of Power. The BBC had adopted the motto "Nation shall speak peace unto Nation" (still carved in stone on its portals) but perhaps should have added: "but not from Continental stations in English". They objected on two grounds: they considered they had the sole right to broadcast to Britons and objected to advertising on the air. In addition, John Reith and his supporters, who always seemed to advocate that broadcasting must be morally uplifting rather than simply entertaining, seemed alarmed that Britishers were beginning to actually enjoy their knob twiddling especially at un-Godly hours when respectable people ought to be abed to prepare for the next day's toil. The Establishment, sometimes using dirty tricks and operating in a clandestine way, launched a very serious campaign to try to stop what they considered to be the rot. They lost the battle and soon the brighter kind of programmes beamed at Britain from the continent were seen to have an appeal to a great many listeners and this soon had an effect on BBC programmes, although it was to be a very long time before Auntie adopted anything like a policy of "If you can't beat them — join them".

As well as gathering together an amusing story, the author has the serious point to make that such broadcasting was a really worthwhile international effort which helped to forge international links. The wireless booklet bargain of the year at a pound!

Book Review

by Desmond Thackeray

Wrong number?

Vintage Telephones of the World, P. J. Povey & A. J. Earl. Peter Peregrinus 1988, hardback 8vo, £25 (?) Contents: ix + pp 193 + 30 references + index 4pp, 263 ill.

This book makes a good visual impression when opened almost anywhere, a big improvement on one of the earlier volumes in the same IEE History of Technology Series. And moreover, the reader who wants 263 captioned illustrations of generally good quality is getting them for less than 10 pence an image. I am less happy about the reader who is looking for £25 worth of information from the text, for that seems to have been fitted in where it could and without enough reference to the illustrations. My own view is that more than 200 octavo pages is required to do justice to this subject; and to adapt a policy of "almost all technicalities have been omitted" in a subject so technical, and this in a book promoted by the IEE to serve today's interest in technology, I find very difficult to understand. But,

if I make it clear that this is not the scholarly monograph or reference book that my personal bookshelf still needs, I am nevertheless quite sure that "Vintage Telephones of the World" will find a welcome on the shelves of every public library. If the index had been more thorough, the welcome would be warmer, not least from the schoolchildren who base their essays on library source material. For example, they will find *Campbell's* contribution to *induction coil* theory indexed only under "Telephones: Anti side tone, 167"; and with no mention of anti side tone in exchange equipment prior to 1920, since this book is about subscriber instruments. Wireless buffs might reasonably expect to find obvious index references both to use of telephone transmitters (i.e. microphones) in *RT* and *broadcasting*, and to the *Nellie Melba* picture on page 73. Let us hope that if the IEE sponsor a second edition it will have a more thorough index, and embrace in a longer text the technicalities that would bring the book much closer to the author's expressed hope "that this book . . . will give an insight into the problems of telephone design". And how about a few words on toy telephones, too?



Looking back . . .

From *Wireless World and Radio Review*, Feb 3rd 1932.

S. G. Valve in LF stage

The use of an S. G. valve in an L.F. amplifier was discussed by Mr D. McDonald B.Sc., at the last meeting of Slade Radio, Birmingham. After the circuit of the amplifier had been described and various response curves shown, a demonstration was given. With an R. K. Senior permanent magnet type of speaker the reproduction proved very good. The lecturer showed how, by the use of various resistances, needle scratch could be almost eliminated.

From *Wireless World and Radio Review*, Feb 3rd 1932.

Baird television

By the purchase of 800,000 Baird deferred shares, Mr. Isidore Ostrer, President of the Gaumont-British Picture Corporation, has, we understand, secured control of Baird television. Voting control will be registered in the name of L.B.T., Ltd., the directors of which are to be Mr. Maurice Ostrer, assistant vice-chairman of Gaumont-British, and Mr. Sydney Moseley, vice-chairman of Baird Television.

From *Wireless World and Radio Review*, Feb 3rd 1932.

A critical moratorium

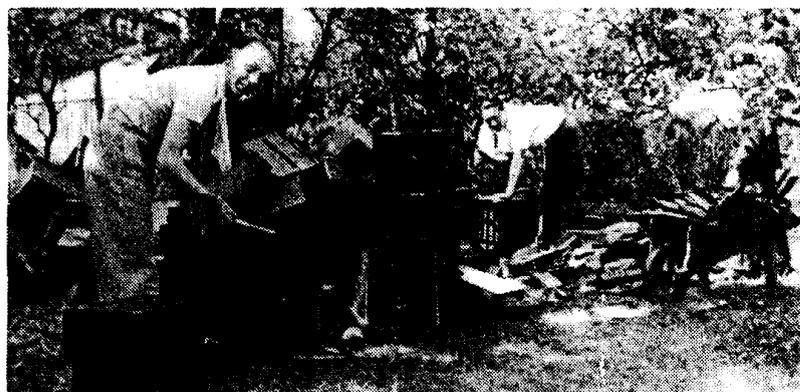
Here is a timely warning for all who may be tempted to use precious stamps and paper on a fruitless task. The B.B.C. have decided to ignore all criticism of Henry Hall's broadcast dance band during the first three months of its service.

From *Wireless World and Radio Review*, Feb 10th 1932.

Watch Luxembourg

Europe's first "publicity broadcasting station" is nearing completion at Luxembourg. We understand that the initial tests may be expected on or about April 15th next. Considering that the power will be in the neighbourhood of 200 kilowatts, the "publicity" should be fairly extensive. The wavelength will be 217.4 metres.

From *Wireless World and Radio Review*, Feb 3rd 1932.



Smashing old sets

If this pre-war photograph is typical of the sort of thing 'hat used to happen in the wireless trade before the second world war, it gives an important reason for today's shortage of vintage sets. The photograph was sent to "The Wireless Trader" in June 1937 by a Mr J. B. Postle of Norfolk, who said "It will give you some idea of what we do with old radio sets in our area. We smashed up about 300. It is what we call 'cleaning our market'. I would not like to state the loss incurred, but it certainly keeps our business on a good footing". Most of the sets were apparently taken in part-exchange for new ones. How many "goodies" can you spot?

Another American relay

"Hello, Europe!" Is the title of the programme which is to be relayed by the Columbia Broadcasting System from the United States to Regional listeners on Monday next, February 15th. The programme consists entirely of Negro spirituals. The Fisk University Chorus, directed by Edward Matthews will be heard in the following:- "Rise, Shine, for the Light is Coming," "Balm in Gilead," and "Go Down Moses." Ray Francis Brown will direct the Chorus in "Listen to the Lamb."

From *Wireless World and Radio Review*, Feb 10th 1932.

Top notes in trouble

Distinction came to one member of the South Croydon and District Radio Society at its last meeting, when he imagined that a heterodyne whistle was actually a continuation of a jazz number which had just been received. The evening was devoted to quality reproduction, particularly in regard to the high notes, and experiments with various types of loud-speaker showed how certain notes in the musical scale suffer when reproduced on different instruments. The test was carried out by means of a very high heterodyne note which, in the case of some loud-speakers, was not reproduced at all!

Feedback

Letter

from Dr. César Milego-Pertierra

"No Future for TV"

Last summer I was in West Berlin (my wife, "eine Berlinerin", used to work for the TV and Radio Station, Sender Freies Berlin), and on the 13th August I celebrated with some friends (also interested in broadcasting) the 100th anniversary of John Logie Baird's birth.

We spent several pleasant hours exchanging information, memories and schnapps. After the first toast to the memory of the "Televisor", I read aloud:

"Saturday, April 7, 1934. Mr. H. M. Pease, former Vice-President of the British Radio Manufacturers' Association, now Director of Standard Telephones and Cables, has been interviewed in New York, by "The Broadcaster" New York correspondent. Mr. Pease said that he was interested "in the USA exploitation of short-wave reception, and I believe that the ultra-short wavelengths offer great possibilities in radio development. Along with this, will come the development of television to a really practical stage.

"When television does arrive, it will bring along an entirely new technique in broadcast procedure. Television programmes will be much more difficult to construct than ordinary broadcast presentations. However, television is more apt to be used in the theatre than in the home. People will undoubtedly be willing to pay for admission into an auditorium, where they can watch a boat-race or similar event while it is taking place. "But, in the home, it is questionable whether the listener cares to stare continually at a singer or speaker."

Famous last words, indeed! How wrong can you get? Mr. Pease's dismissal of TV's future provoked a lively debate amongst my circle of German aficionados.

In March 2, 1936, at Manchester Radio Traders' Club, John L. Baird said:

"I think I am fairly safe in saying the B.B.C. will be having a television broadcast service well under way by the time the Olympia Radio Exhibition opens in August. "We, ourselves, have receivers available, and I expect that other firms will also have instruments on the market."



A 1935 photograph of William Taynton, who in 1925 became the first person ever to be seen on a television screen. He is holding a 15" dia. TV tube, manufactured in the Baird Crystal Palace laboratories, and the largest then available.

He added "television will not kill ordinary radio business, but will open a new and profitable territory. We are at the beginning of a Television Era, in which it will become a permanent factor in the life of the community, like the kinema and sound broadcasting".

He anticipated that television "would ultimately supersede the kinema film and that performances would be transmitted from central studios to the kinemas. The radio set of the future will also include television".

To return to Berlin, some 53 years after J.L.B.'s more accurate predictions: More lively discussion took place, after my second reading on TV's prospects in the 1930s according to the 'gospels' of those pioneers, and when somebody remarked on how the German pioneers had vanquished the 25-35 miles' range drawback "by being the first to introduce what today we are beginning to take for granted, i.e., cable-television. The sensation of the 1936 Leipzig Spring Fair was the opening of the world's first two-way and high-definition Television-Telephone service between Berlin and Leipzig, using coaxial cable.

The sinister Dr. Goebbels must have been very pleased at the propaganda coup for Nazi scientists . . . particularly with the Berlin Olympiad a matter of weeks away.

But I had, up my left sleeve, a final Baird trump-card, dated 28 January 1926, a good ten years before the Leipzig Fair 'first'.

Letter:

from Brian Pethers
Grandad's set

I often visited my grandfather during the late forties, when he was helping me to build my first one-valver. His own short-wave receiver was a three-valve battery set which was always being modified or rebuilt. One of the modifications tried was the substitution of a vari-mu pentode for the screen-grid h.f. stage. Four-pin coils were used, the lower frequency ones wound on proper ribbed formers and the 10 metre and 5 metre ones on old valve bases. The aerial coupling was a loosely wound coil placed over the h.f. coil. Separate tuning was used in the h.f. and detector stages, with a bandspread condenser in the latter. Raymart condensers were used, fitted with large knobs having integral, two speed slow-motion drives. The h.f. stage was choke-condenser coupled to the detector, the condenser passing through a screen and terminating in a short length of lead with a croc clip to a tap on the detector coil. The reaction circuit was of the series condenser type, and experimenting with the H.T. battery tapping for the triode detector stage gave the smoothest control of reaction. The detector was resistor-condenser coupled to a small pentode in the output stage. The headphones were directly in the anode circuit of this valve. Sandwiched in the plywood chassis was a sheet of tinfoil (cut from a cocoa-tin) that acted as a ground plane. Another sheet behind the plywood front panel was to remove hand-capacity effects.

With a good, long aerial and a wet earth rod, the world was there for the listening. There was no hardship in having non-gauged tuning. As long as the two dials were kept on roughly the same number, one could explore over a limited wavelength range with the detector bandspread tuning. If something interesting came in, the h.f. stage could then be tuned for maximum volume. The background quietness of a battery operated receiver is something one never forgets.

Editor's note: Reminiscences from other members are welcome.

Letter

from Norman Burton (Australia)

Those three dots

Whether or not Marconi heard the 3 dots in Newfoundland it seems to have been overlooked that they were also heard by Mr. Kemp, and since Marconi was an honourable man he would not have claimed the hearing of them had he not done so.

The suggestion that keen listeners at favourable sites in Newfoundland attempt to hear the BBC Long Wave station using crystal sets would be unlikely to succeed today, although crystal sets were used extensively in the early days on commercial traffic across the Atlantic. Today, there exists over virtually all the world a high noise field generated by the use of domestic appliances etc. which was *not* the case in 1901. Furthermore an amplitude modulated station does not have the range of a spark station; this was very noticeable in the early days of broadcasting, when one could always hear the coast stations over a much greater distance than the broadcasting stations of the time.

Freak conditions must also be taken into account. As an example of these, a Mr. Hally New of Philadelphia, U.S.A. had verified by the pre-British Broadcasting Corporation station in Birmingham, 5IT, reception of their programme on 12th April 1923 which was transmitted at noon GMT-7AM in Pa. It must also be taken into account that the signals were transmitted over the ideal medium-sea water.

On freak conditions I have in my possession a tape recorded in West Australia at noon local time of the transmission of VT, Bermuda, on 500K/cs. This is clearly an example of freak conditions and it is interesting to conjecture by what mode. Shadow graphs lead to nothing that could be considered conclusive and the mode suggested is the "Whispering Gallery" mode where the signal is trapped between reflective layers emerging at a point where the refractive index is different. Such a signal could go round the earth more than once before coming down to earth.

How signals from Poldhu propagated themselves across the Atlantic on December 12th 1901 really does not matter: they did, they were heard, and eventually, there evolved from them the long distance communications

services we have today. We should be grateful for Marconi's faith and persistence.

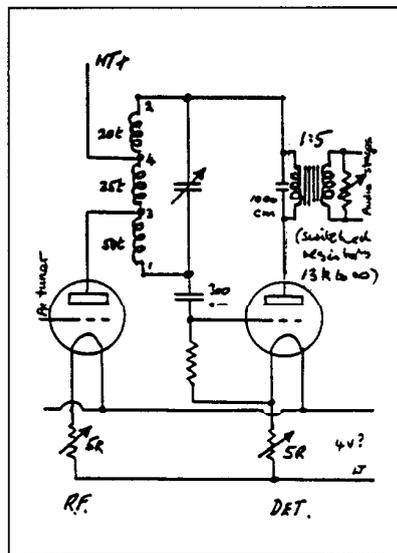
(The above letter has been abbreviated)

Letter

from Desmond Thackeray

Information wanted:

from Desmond Thackeray, 7 Beech Close, Byfleet, Surrey KT14 7PS. Tel: Byfleet 41023.



This is the circuit of a mid-20s HF and Detector arrangement which seems to have two unusual features. The first is the use of *tappings on the tuned HF coil for HF coupling*, rather than a primary untuned winding. The second is the presence of a variable resistive loading on the secondary of the audio transformer. I'd like to know *where* either of these ideas originated, and whether in a manufactured receiver or in a magazine design. For those unaccustomed to sorting out the remaining features visually, note that the regenerative detector could well have been called an 'ultra-audion', though a later version would perhaps see it as a Hartley oscillator. It would obviously have been an improvement to put the audio transformer in the common HT lead. Turns on the coil windings are my own estimate and therefore only approximate; the coil is shielded from the aerial tuning arrangements. Valve types not known, but could have been R4B or D.3HF perhaps. *Ideas???*

*This transformer loading feature also appears in Marconiphone receivers V3, V4 and their amplifier NB2.

Letter

from Chris Price

Among the Optimists

I recently went to a large open-air antiques fair at a showground. Judging from the "antiques" it was held about fifty years too early, but despite pouring rain I found a few wireless items.

The first was a valved power-supply of the 'thirties which stood in an inch of water and was declared by the vendor to be a bargain at £55 since it was "in perfect working order" and complete with (soggy) original flex. I also spotted two Gecophone 1 empty boxes, stripped and refinished, plus enough parts to complete one and with a price-tag of £170. But I did manage to buy an early 30's pickup at half the £10 marked price and was lucky to find for £20 a rusty but un-dented Eddystone horn speaker (even the Eddystone private museum does not have one) which after restoration looked nice but produced poor sound even for a 1924 speaker: is this why they are so rare? My highlight of the day was found among some acoustic gramophones: a diminutive Alba C112 priced at £150 which had a plastic cable fit to run a 3kw fire. The stallholder spotted my BVWS badge and asked if I knew anything about the set. I sent him the circuit and explained the excitement of running it without the linecord! I've heard no more of him since: perhaps he tried to use the set and can't write back from his present situation?

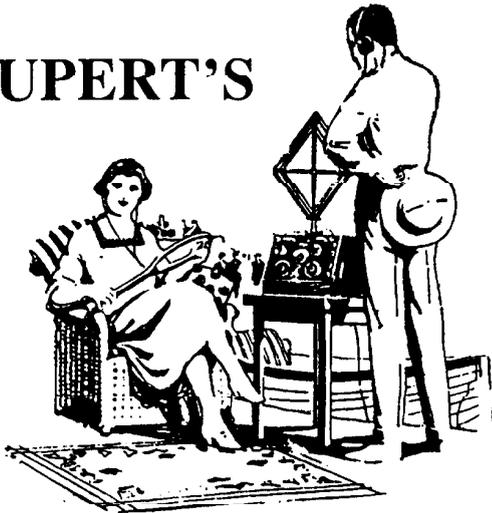
The last item of interest was a crystal set. It was described as "in fine condition" having had the cabinet and panel re-polished, new terminals fitted (old holes remaining) and a crystal detector which had recently been turned up on a lathe. I was assured that the crystal had been "soldered in with best solder". All this was a pity. The maker's name - Phillip Harris. Birmingham" just visible, showed it to be a rare one.

Optimists are also found at Car Boot Sales. At one, a stallholder showed me a black Ekco AD76. One knob "had gone brown with age"; it had various holes in the side and had "two valves, you can see them from the back" (through the damaged back). The price asked? I quote: "I had to give £100 for it, so I can't do it for less than £250".

But there was a brighter moment: I got four pairs of BBC stamped earphones for £10 - "no offers".

Editor's note: I should be glad to hear tales from other optimistic scavengers.

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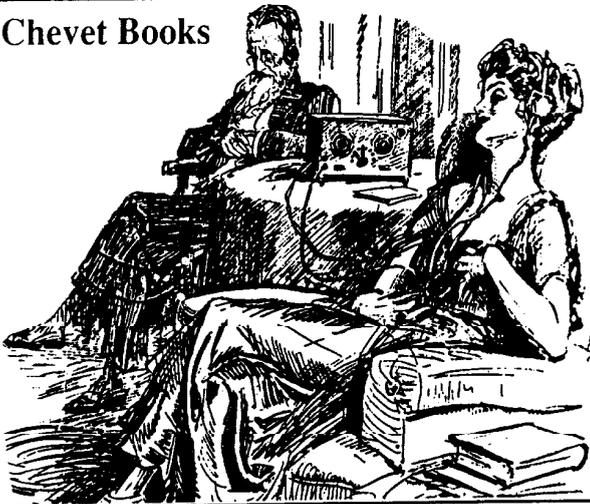
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