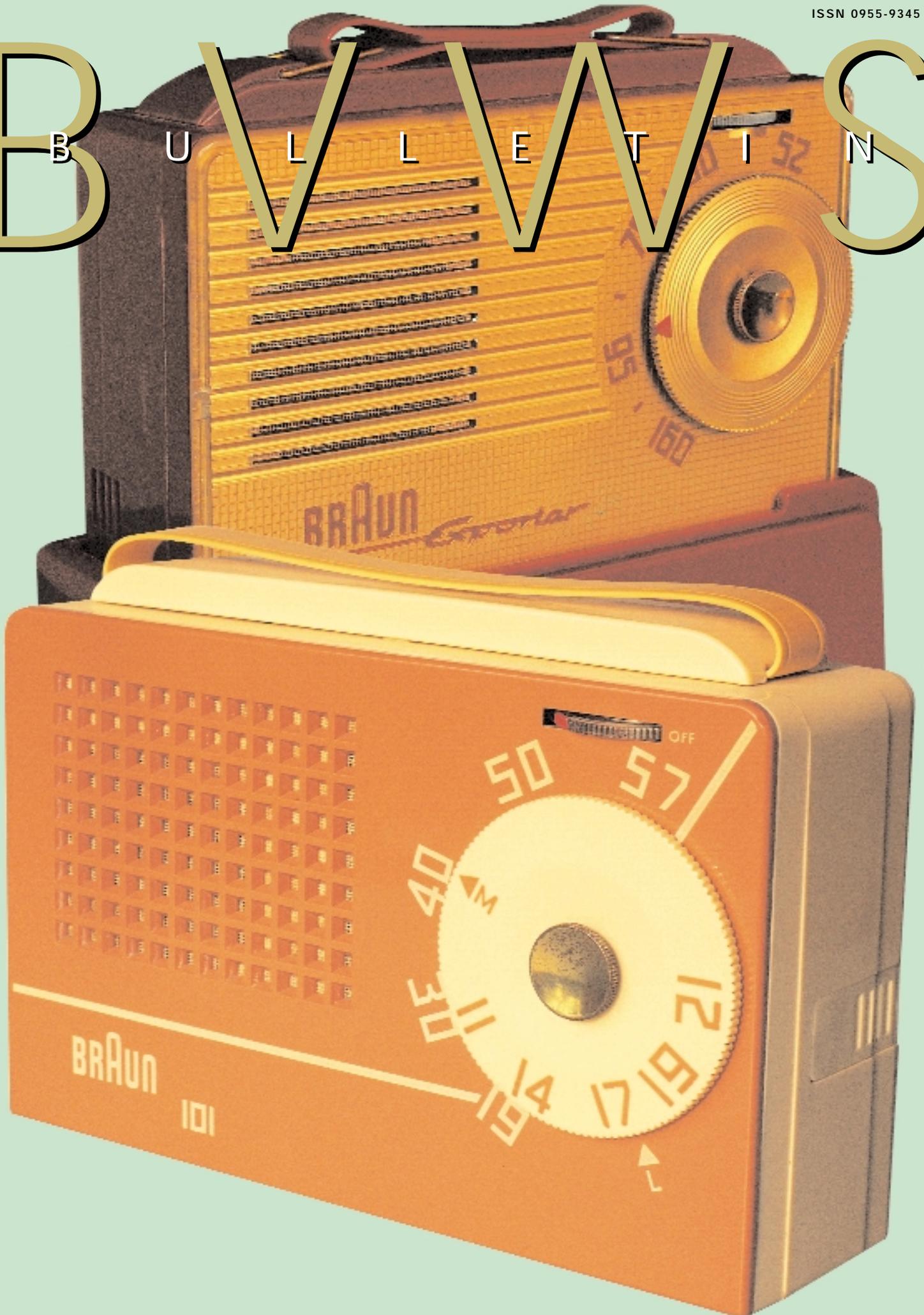


# BULLETIN



# BULLETIN OF THE BRITISH VINTAGE WIRELESS SOCIETY

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**Emergency Editor:** Gordon Bussey.

**Interim Production Editor:** Carl Glover, c/o BSS 1  
Rothsay Street, London, SE1 4UD (to whom all editorial enquiries should be addressed). Tel 0181 469 2904

**Layout and Design:** Carl Glover & Gordon Bussey

## Emergency Committee

**Chairman:** Geoffrey Dixon-Nuttall,  
Longmeadow, Miles Lane, Cobham, Surrey KT11 2EA

**Deputy Chairman:** Gordon Bussey

**Treasurer:** David Read

**Committee Member:** Dr Tom Going

The following provides a service for the Committee  
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# I N P A S S I N G

## COMMENTARY ON THE 1994 ELECTION

The Officers on the 1995 Committee have been elected for the first time by Postal Ballot, organised by the Electoral Reform Society through its balloting services subsidiary. On one level, the cost has been fairly high - £926 but, at approximately 90 pence per head, it will come to seem a small price to satisfy the wishes of members present at the AGM on 4th December 1994, and the needs of the Society as a whole.

With stability reached it should not be necessary to use Electoral Reform Ballot Services again, and voting papers will be included in the appropriate issue of the Bulletin. In addition the AGM might be better preceding a programme of talks or films, rather than swap meetings or auctions, which tend to be pre-occupying for members. The ballot obtained a valid return of 52% from members, a very good response. Neither the members of the present committee nor the future committee will ever see the voting papers, which will be held by Electoral Reform (Balloting Services) for 12 months.

You will notice that three of the jobs were unopposed. Whilst this is a pity since competition is preferable, it is by no means unusual in societies and clubs where certain more onerous tasks are concerned. You will also see

that we used "Single Transferable Vote" for the part of the election concerned with "ordinary members". This is considered the fairest method of all, because if, for example in an election of four members, your first, second and third choices are all "outright losers", your fifth, sixth and seventh choices are "bumped up" to take their places. This is a complex mathematical process for which the Electoral Reform Society use a computer, and if any member has difficulty understanding the table above and would like a copy of the Electoral Reform Society's explanatory leaflet I will send it on receipt of an S.A.E.

I believe the time has come for future elections to be postal ones, and this will give a fair voice to our far-flung membership. However, it may be appropriate for these ballots to be internally organised with independent scrutineers. It will be up to the membership to keep the new committee "on their toes". By the same token, they will need your help, need your encouragement and need your feedback. I wish the Society and new committee well.

Tom Going  
Election Organiser

## RESULTS OF THE 1994 BVWS ELECTIONS

### 1995 Committee

Chairman	Willem Hackmann
Bulletin Editor	Carl Glover(unopposed)
Minutes Secretary	Dave Adams
Events Organiser	Ken Tythacott (unopposed)
Newsletter Editor	Ian Higginbottom
Treasurer	David Read(unopposed)

### Ordinary Members

Gerald Wells
Rupert Loftus-Brigham
Mike Barker
Peter Bannon

The following were not elected:  
Guy Peskett, Simon Wade, Christopher Ryle and Enrico Tedeschi.

The final voting statistics were as follows:

No. of ballot papers distributed	1,031
No. of ballot papers returned	566 54.8%
No. of ballot papers spoiled	2
No. of ballot papers unsigned and un-named	25
No. of valid returned ballots	539 52.3%

### Votes Cast:

Chairman	Willem Hackmann (elected)	323
	Peter Bannon	209
Minutes Secretary	Dave Adams (elected)	297
	Mike Barker	235
Newsletter Editor	Ian Higginbottom (elected)	307
	Simon Wade	120
	Christopher Ryle	105

Ordinary Members The table presented gives the full matrix of single transferable votes results.

Candidate	Stage 1 First Preferences	Stage 2 Surplus of Wells Gerald	Stage 3 Surplus of Loftus-Brigham	Stage 4 Exclude Ryle Christopher	Stage 5 Exclude Peskett Guy	Stage 6 Exclude Wade Simon
Higginbottom Ian	WITHDRAWN					
Loftus-Brigham Rupert	59.00	+70.35 <b>129.35</b>	-21.35 108.00	108.00	108.00	108.00
Bannon Peter	32.00	+31.49 63.49	+2.94 66.43	+6.55 72.98	8.41 81.39	+17.83 <b>99.22</b>
Adams Dave	WITHDRAWN					
Hackmann Willem	WITHDRAWN					
Wells Gerald	<b>332.00</b>	-224.00 108.00	108.00	108.00	108.00	108.00
Peskett Guy	16.00	+18.09 34.09	+5.88 39.97	+3.64 <b>43.61</b>	-43.61 0.00	
Wade Simon	20.00	+23.45 43.45	+3.57 47.02	+3.55 50.57	+7.95 <b>58.52</b>	-58.52 0.00
Barker Mike	37.00	+39.53 76.53	+4.62 81.15	+4.35 85.50	+14.90 100.40	+11.00 <b>111.40</b>
Ryle Christopher	12.00	+10.72 22.72	+1.05 23.77	-23.77 0.00		
Tedeschi Enrico	30.00	+28.14 58.14	+3.15 61.29	+5.01 66.30	+9.05 75.35	+17.05 <b>92.40</b>
Non-Transferable	0.00	+2.23 2.23	+0.14 2.37	+0.67 3.04	+3.30 6.34	+12.64 18.98

The vote in the bold type represents the final vote given for each candidate, after redistribution of "surplus votes" of "outright winners" and the total votes of "outright losers". The counting process goes through a series of stages. In this case, these re-dealt out, in proportion, the excess votes of Gerald Wells and Rupert Loftus-Brigham, and then those of the "losers", in sequence. The underlining marks the stage at which the winners became identifiable. The figure of 108 votes represents the "quota" or minimum number of votes to ensure election of the candidate. At each stage, 1-6, all the voting papers were recounted before the correct proportion was distributed among those candidates still "in the running", and this accounts for the decimals.

It is interesting to note that the final order of preference for the candidates would have in fact been the same if the first preferences alone had been followed.

Now that the postal ballots are over the Emergency Committee is looking forward to handing the management of the affairs of the Society over to the newly elected Chairman and Committee Members. This will take place at a formal handover at the Committee's traditional meeting place (the Vintage Wireless Museum 23 Rosendale Road, London SE21) shortly after the completion and posting of this Bulletin. We are very grateful to Tom Going for the immense amount of work and dedication he has put in to planning and managing the election process.

It is appreciated that some members have decided to "wait for the dust to settle" before they decide whether or not to renew their subscriptions and indeed many have been quite explicit in this respect. During the very small period of time since the Emergency Committee assumed responsibility it has produced three Bulletins, two with a new face and to a new standard, and carried out postal elections to a successful conclusion. At the same time it has managed the many day to day issues that arise in a busy Society. Those members with a genuine interest in vintage wireless and TV should now feel able to get off the fence and renew their subscriptions. Members who have not renewed will have noticed that a period of grace has been allowed but will appreciate that this cannot continue indefinitely.

In handing over to the newly elected Committee the Emergency Committee will table a number of recommendations and key issues which will form part of the first agenda and it is appropriate to touch on the major ones here.

1. In the future the Committee's deliberations and decisions should be reported in summary form in the Bulletin.

2. Since the Society was formed in 1976 questions of its Constitution, the possibility of charitable or limited liability status, and the need for externally provided services such as secretarial, membership and accounting have often been considered. These questions will continue to loom large with the new Committee because with the membership now over 1,000 it is becoming increasingly difficult for Committee members, particularly those in responsible full time jobs to give enough time for a professional job to be done.

3. Other items for consideration include the possibility of fixed maximum terms for service on Committee in named jobs, readers' surveys for Bulletin content and lapsed membership, the seeking of advertising revenue and a review of the quality of the various services the BVWS provides to members.

Finally we extend a warm welcome to new members who have joined since 4th December 1994 and hope to see you at one or more of the Society's meetings.

David Read  
For the Emergency Committee

# VALVES: WHAT THEY DO AND HOW THEY DO IT

## PARTS 3 & 4

By: Pat Leggatt

### PART 3 The Triode

As one might expect from the name, the triode has three electrodes. As with the diode, there is a filament or indirectly heated cathode and there is an anode: but there is a third electrode, the grid, placed between the cathode and anode. The grid is nearly always in the form of a coil of wire, circular or flattened, and serves to control the current flowing from cathode to anode (Figure 2). The reason it is called the grid is that originally this control electrode took the form of a flat criss-cross of wires like the grid of a drain cover.

To understand the operation of the grid all that is needed is to recall the "like charges repel, unlike charges attract" slogan. If the grid is made negative to the cathode (known as negative grid bias) it will tend to repel the emitted negative electrons so that some are unable to get past the grid to the anode. The more negative the grid is made, the fewer

electrons pass through the gaps between the grid wires and the lower becomes the anode current: if the grid is made quite strongly negative, the anode current may be completely cut off.

If, on the other hand, the grid is made positive to the cathode then the grid will attract the emitted electrons and accelerate them. Some of the electrons will actually hit the grid wires and form a small grid current: but since the grid wires are quite widely spaced, most of the electrons will shoot through the gaps and end up at the anode.

In practice it is quite unusual for the grid to be made positive to the cathode, because the grid current which will then flow has an undesirable loading effect on the preceding circuit which is feeding a signal to the grid. This grid current loading can spoil the selectivity of a tuned circuit, or give rise to distortion in an audio amplifier. So it is nearly always the case that the grid of a triode is biased *negatively* to the cathode so that no grid current flows.

With a negatively biased grid restricting the current from cathode to anode, one may wonder what happens to those electrons emitted from the cathode which are held back by the grid: do they just pile up in a frustrated heap? Well the answer is yes they do: they form a cloud in the space immediately surrounding the cathode and this cloud is known as a 'space charge'. Being made up of electrons, the cloud is negatively charged and tends to repel other electrons which are trying to break out from the hot cathode. The electrons which are needed to form whatever anode current is flowing are drawn from the space charge 'reservoir'; the space charge cloud thus becomes less negative and allows some electrons to escape from the hot cathode to maintain the balance.

So to sum up, the cathode emits electrons which form a space charge cloud and limit further emission; and the negatively biased grid controls the number of electrons which are allowed to leave the space charge cloud and proceed to the anode. Since the grid is negatively

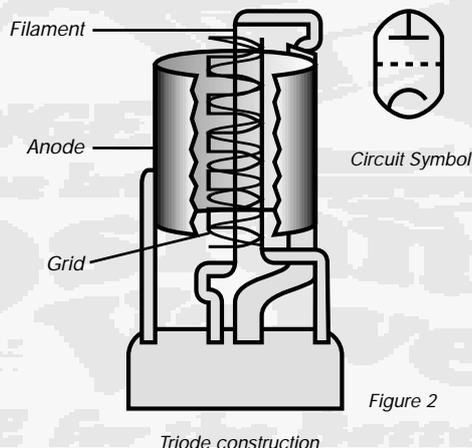


Figure 2

Triode construction

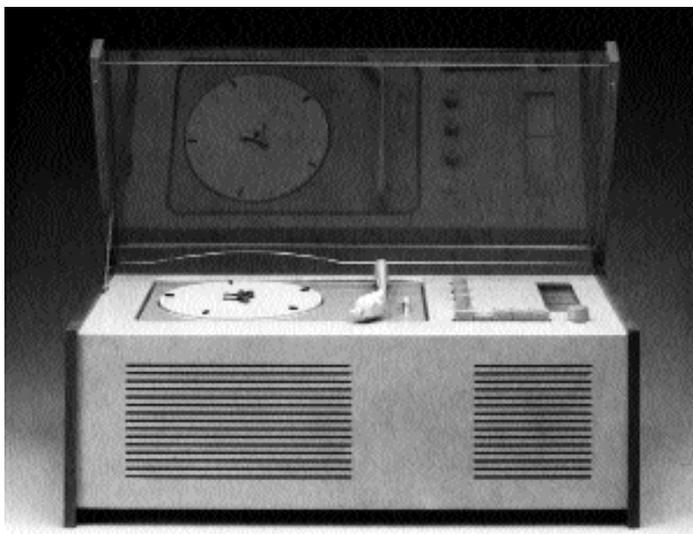


# BRAUN A HISTORY OF SUCCESS BASED ON DESIGN

by David Read

What is good design? Dieter Rams, Design Director of Braun, must know. Since the War Braun has become an institution in the field of industrial design. Its products have won more international awards than those of any other company and Rams, now aged 63, is an Honorary Royal Designer for Industry at the Royal Society of Arts in the UK.

Dieter Rams was born in 1932 and graduated with honours from the Wiesbaden School of Art where he studied architecture and interior design. He joined Braun in 1955 after a period working for the architect Otto Apel. Braun, a manufacturer of radios and electrical products from the 1930's had subjected its products from the early 1950's to the searching criticism of Hans Gugelot of the Design School at Ulm. The Ulm School had from its foundation carried on the tradition of the Bauhaus - the State School for Art and Design at Weimer - and its famous gurus such as Walter Gropius and Mies van der Rohe. Hans Gugelot's influence was fundamental in changing Rams' ambitions from architecture and interior design to working for Braun and founding its design department on some revolutionary principles. From Hans Gugelot he learned that creativity in engineering is more important than in the studio and together they introduced a model design method based on engineering development, proto-typing and feedback. A



The Braun SK4 nicknamed 'Snow White's coffin'

critical and exciting design objective concerned the relationship between people and machines, and branching from this the fundamental belief that the long-term sales of a product depend on its simplicity of operation and functional design. The designers at Braun worked with engineers to define the shape of the product in all its details; the basic form and proportions, the arrangement of its operating functions, and the structure and colour of its surfaces, and under Dieter Rams, Braun's design department became the creative centre for the entire company.

What then characterises the designs of Dieter Rams? They are best summed up by the Bauhaus principle that "form follows function", known as the F<sup>3</sup> principle. According to Rams it is the organisation of form, surface, colour and graphics in such a way that a product's function is obvious to the user and fulfils its purpose as efficiently as possible. He omits the unimportant and emphasises what matters. Everything else he considers an ego-trip, mere style; to make products chic as an end in itself is nothing more than

packaging. In these rigorous ideals we can begin to see why the design of Braun's products seem timeless. To follow fashion is to become quickly dated, whilst simple designs that eliminate waste and are based on functional quality still seem modern after 30 years.

Rams' first design in collaboration with Hans Gugelot was the SK4 combined radio and gramophone in 1956 illustrated in Figure 1. A simple oblong of wood and white plastic with fingertip controls and a clear Lucite cover it was soon nicknamed Snow White's Coffin. This was the first product of its type to honestly display its function without disguise and without ornamentation. The operating elements were clearly ordered and could be understood at a glance. The design derived its structure purely from its function and not from elements alien to it. The transparent lid was unique and in various forms has been copied ever since. It was a design tour de force and made competitors models look clumsy and dated overnight. Klaus-Jurgen Sembach, the Director of Munich's State Museum called it "the beginning point for post-war German design". Today it is the most famous cult object in the world of radio/hi-fi and began a period of commercial success during which Rams produced a small range of radios for Braun which were the first of their kind in Germany.

For this article I have chosen to illustrate just three of Braun's design classics in addition to the SK4. The Braun 101 valve radio designed by Hans Gugelot in the Ulm Design School in 1955 illustrated on the cover, T1000 transistorised all wave radio, designed in 1962 and illustrated on the rear cover and the T3 shown overleaf. The 101 has a cream and pale chocolate coloured plastic case and handle which measures only 175mm by 120mm by 60mm. The chassis uses B7G battery valves and a conventional electrical design. The quality of construction, attention to detail and performance are however exemplary for a small battery radio in this class.

The T1000 was Braun's contribution to a portable all wave radio. It has two long-wave and two medium-wave bands plus continuous coverage from 1.6 MHz to 30 MHz switchable in 8 bands engaged by rotary drum. In addition a separate FM chassis is included which is tuned and switched by dedicated controls with subtle orange colour coding. The quality of construction is unmatched in any radio I have examined. For Rams the saving of volume was always a primary objective, working with engineers from the inside out, and the T1000 is an ultimate in complexity expressed in superb and simple functional design. It measures only 360mm by 240mm by 130mm in a brushed aluminium case with detachable swing down front cover. BFO, MGC, bandspread, bandwidth filter and antenna tuning including switchable ferrite rod are provided. The T1000 was a pioneer development and the first transistorised all wave radio for domestic use of such quality and comprehensive specification. This technically outstanding unit, matched by few professional receivers is still highly esteemed by today's experts. The performance and aesthetic design are such that it is truly hard to believe that it was produced over 30 years ago.

Having set the ultimate standard for a domestic radio, Rams pulled down the shutters and the T1000 was the last portable manufactured by Braun. This move was also influenced by the emerging Japanese dominance of the radio and hi-fi market; a sad irony since Rams design principles had permeated Japanese design literature in a culture where simplicity and compactness and the minimal are rooted in centuries of tradition.

Braun was acquired by Gillette in 1967 and a virtual clear sweep of management had taken place by 1973. To those schooled in American

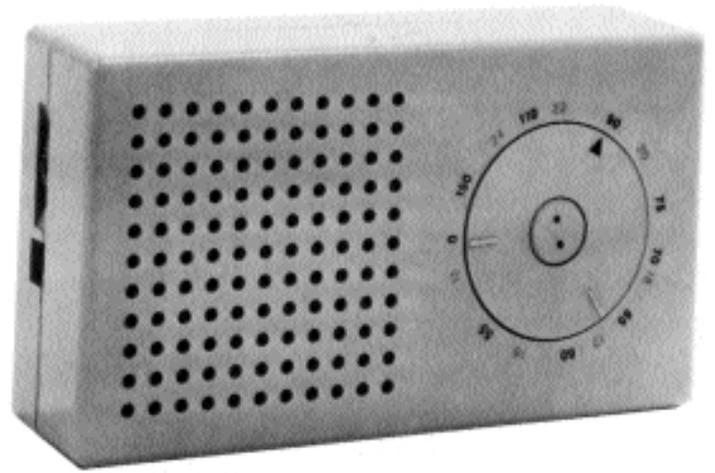


Dieter Rams

marketing Braun was a hopeless case: "it just didn't know what the market wanted". This mechanical assessment so typical of a certain sort of business school training gave Rams problems. He said at the time "I have my problems with marketing, market research can only reflect what already exists". Gradually the realisation that Braun's designs had created the market began to die. Braun's products are now targeted in the shaver and small appliance market and the design magic is not quite what it was. Looking at Braun's current product range it is clear that the design differentiation is not there in the old powerful way; relentless minimalism and the Japanese have reduced matt black to a mere cliché. Today the tradition is exemplified by the calculator designed by Rams in 1977 and still on sale and much sought after. Expensive as a calculator it is cheap as great design; the only calculator that is universally regarded as a pleasure to use because of its supreme functionality and subtle use of colour for the operational buttons and controls.

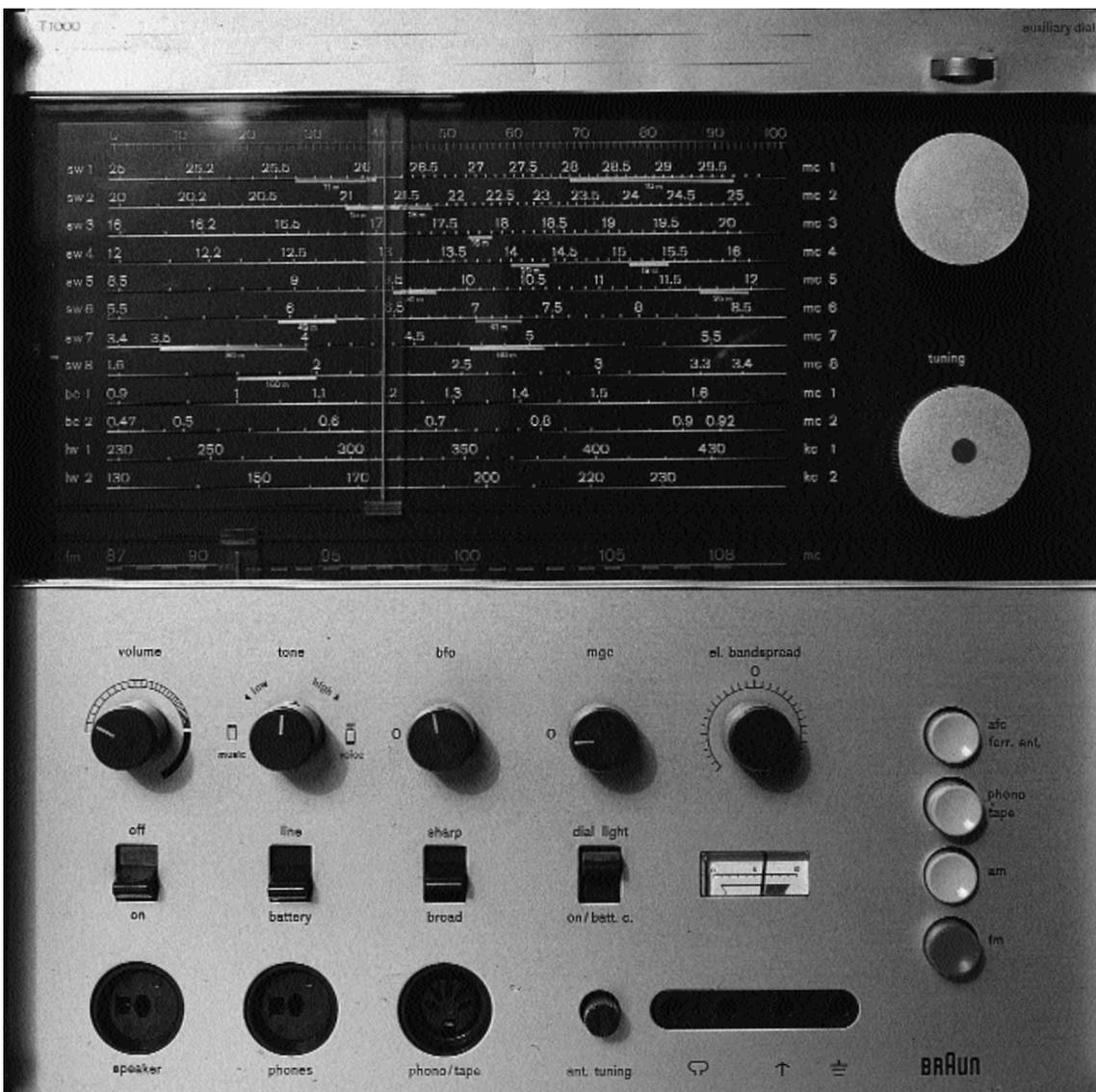
For many people Rams' designs will always be regarded as typically Lutheran in their austerity and are best explained by Rams' own description of the Modernist Creed;

"To me good design means as little design as possible.  
 Simple is better than complicated,  
 Quiet is better than confusion.  
 Quiet is better than loud.  
 Unobtrusive is better than exciting.  
 Small is better than large.  
 Light is better than heavy.



The Braun Pocket T3 circa 1958

Plain is better than coloured.  
 Harmony is better than divergency.  
 Being well balanced is better than being exalted.  
 Continuity is better than change.  
 Sparse is better than profuse.  
 Neutral is better than aggressive.  
 The obvious is better than that which must be sought.  
 Few elements are better than many.  
 A system is better than single elements".



It is undeniable that these principles result in a beauty whose lack of decoration is too severe for many. It is also claimed that his designs are too expensive, particularly by those who start with price as the major criterion. However, proof of success lies in the marketplace where Rams' designs commanded sufficient price premium to allow for their outstanding engineering quality, as well as being chosen by museums of arts around the world. In its great period Braun's designs under Dieter Rams exemplified the words of the architect, teacher and author Sir Nikolaus Pevsner: "to fight against the shoddy design of those goods by which our fellow men are surrounded becomes a moral duty".

The Braun T1000 showing control layout

# MY MEMORIES OF BURNDDEPT

By Charles H Jones

Following the special supplement we published last year on Burndept we are delighted to add these reminiscences

*Below: Mr Pat Hickman, assistant general sales manager, demonstrates the Royal Ascot to a quartet of V.I.P's. On his immediate left is Mr T.N. Cole, one of the pioneers of dry battery manufacture in this country. Standing beside him is the man who shared in that great adventure, Mr. R.P. Richardson, managing director of the Vidor-Burnddept Group. Opposite are Maj. H.S. Prince, deputy director, IEME, and Col. H.M. King.*



I gather that the firm started in the early days of Wireless and that the name derived from the name of the founder, a Mr. Burnham of Deptford. The firm moved in those early days to premises on Blackheath in Elliott Vale. (The building is currently, sadly, being demolished for a new edifice or edifices). The Firm at that time specialised in the marking of wireless sets, mainly of the crystal variety, and the supply of components to the growing band of wireless enthusiasts. These components consisted of grid leaks, capacitors, and valve holders, as valves became the vogue. They also marketed a dial called the Ethovernier and a moving iron horn loudspeaker, called the Ethophone, which was manufactured for them by Johnson and Phillips of Charlton. The Burndept firm later removed to Woolwich, and went into business as wholesale electrical factors as well as keeping on their interest in the supply of small wireless parts. They also reverted to the old name of Burner's. A Mr. Thomas N. Cole (not to be confused with E.K. Cole of Ekco Fame) had started the firm of Lissen making wireless sets, and with his partner and chemist, a Mr. Richardson, Lissen batteries. He gained control of the Burndept name and business. The battery business was acquired by the Ever Ready conglomerate and Mr. Cole became a shipping magnate trading largely in the States where on the outbreak of War he made his home. Just before the War Tommy Cole had set up the aforesaid Mr. Richardson in the battery business again, using a made up name of his two daughters Violet and Doreen. Hence Vidor. The Every Ready took him to court because an agreement when he sold the firm of Lissen was that he would not compete with Ever Ready in the battery business. Vidor at that time were doing very well making a 120 volt battery, (and a

very good one!) for five old shillings, (25 pence in the new money) and thus cutting the Ever Ready price by half a crown. (or 12.5 new pence). The case was thrown out of Court because the new firm, although financed by Mr. Cole, was headed by Mr. Richardson. The Judge ruling, like Solomon, that a man was entitled to invest his money where he liked. During the war the Burndept side of the firm had gone into the manufacture of communication equipment and was doing very well. At this time they were involved in the design of a special miniature aircraft receiver for modern jet aircraft. I joined Burndept's in January 1955 from Plessey's where I had gone from STC and where I had spent some 16 years. When I joined the Firm the Chief Engineer was a Mr. Bob Holmes, very well known in Radio circles as a very competent Radio Amateur, and well thought of by the RSGB. The firm had three divisions, the Setmaking Division headed by Mr. Ron Hewson, the Industrial Division, headed by a Mr. Kiryluk, and the Communication Division headed by a Mr. Phil Leventhal. I joined the Communication Division as second in command, to take over the design and production of the aforesaid aircraft receiver, the X7473.

At that time the firm were making a number of television sets, all valve, of course and were experimenting with a projection set for home use to compete with the Philips product which had just made its appearance. This used a miniature 3" CRT. They were also, of course, making the range of battery valve sets in the 'Lady Margaret' series which were very popular with the public. They also made a few high class Radio-grams and a small wooden cased mains operated valve receiver. I still have one of these which I have recently got going again. The bread and



my knowledge of the requirements for tank radios obtained during my time at Plessey's.

In those days we all helped each other and Jim Sanderson, the Chief Draughtsman, who had a huge background of knowledge built up from years of experience, (he was formerly with Pye's) was a tower of strength and he and I became very firm friends until his sudden and unexpected death in the late seventies.

In the late fifties Phil Levanthal and Jim Kiryluk had an argument in the Lab and the upshot of it was that Phil was suspended, a court case ensued and Phil finally left. I was then appointed to the head of the division and headed it until I left.

The Managing Director was a Mr. Benny Banks

butter 12" and 17" Television Receivers were also doing very well and were considered to be very reliable sets. The Technical Director had spent a few months in the States and brought back some Philco transistors for use in TV sets and these were handed to the Labs for appraisal. A set was made but was destroyed by a particularly vicious spike due to a flashover in the EHT system. A new set was obtained and a Transistorised Portable TV was exhibited at the next Radio Show. I think it used a 7" tube. At the same time I got involved in testing the robustness of the TV Receiver in its package and during delivery. We finally involved a flight of concrete stairs in the Goods Dispatch Dept and had a high old time rolling TV sets in the final package state down this flight of stairs. Then opening them up and retesting the sets. We found that most of them survived this ordeal very well! I got involved because of

(Bankiewicz) a very nice chap but a jeweller by trade and without much knowledge of electronics. The Technical Director was Mr. Roy Taylor, a rather indecisive gentleman, who like Benny was a son-in-law to Mr. Cole, they being married respectively to the two daughters. Unfortunately when Roy did make a decision it was usually the wrong one! Unfortunately, T.N. had lost his eldest son in an accident at Le Mans when the young Tommy was taking part in the 24 hour Le Mans sports car race, some time in the early fifties. At about the same time that I joined the company he also lost his second son Nigel in an accident in America, whilst Nigel was making a difficult landing in bad weather whilst flying the Company's amphibian aircraft. This knocked poor old TNC for six as one might imagine and he left the running of Burndepts to Roy and Benny. In the early 1960's there was a great furore about black boxes, it was about the time of the Comet disasters and Burndept thought it would be a good idea to enter the market. With this in mind a merger was arranged with a small firm who had already put into production a prototype and were currently sampling the market. The firm Royston Instruments, was found to be rather a shaky concern, the wireless market was failing and the flood of very cheap transistorised sets from the Far East was making a big impact on the British market. The 'Vanguard', Vidor's current set was not awfully popular, although the battery side was booming, things became very sticky, and about this time, the Radio and Television Division was closed down, and Bob Hewson joined me in the Communication Group. He had been within the Domestic Radio Group of the firm all his working life and when I returned from my summer holidays in the September of 1964, I was made redundant. I was the lucky one, I collected a golden handshake, a bonus and my pension money, and left Burndepts. Burndepts soon sold out to Ever Ready, and finally I believe have now ceased virtually to exist. Bob Holmes, Jim Sanderson my Chief Draughtsman, Ron Hewson and several of the others held on for some years, finally collected a measly pension, and retired.

I went on to better things and never regretted it!



*N.B. Please refer to "The Setmakers" for more information on the colourful characters of Vidor which was a wholly-owned subsidiary of Burndept.*

# THE UNIDYNE

## POPULAR WIRELESS' DAMP SQUIB

By: Dull Emitter

May 3rd 1924 was to be a fateful day in the world of wireless. In their issue of that date the magazine Popular Wireless announced A Great Wireless Invention which heralded the dawn of a "new era in Radio Science". George Dowding and Keith Rogers, Technical Editor and Assistant Technical Editor, had discovered a way of detecting and amplifying wireless signals without the aid of a high-tension B battery, which they christened the Unidyne. One "leading research worker" said of this revolutionary and epoch-making discovery that "authorities on valve reception who have written books and articles on valves and their uses will have to scrap them, as the theory of valves will be considerably altered".

Well the theory of valves didn't really have to be altered since the Unidyne still applied a positive potential to the anode, albeit only the 4 volts or so obtained from the filament heating battery. Furthermore the Unidyne incorporated a 4-electrode valve (the Thorpe K4), not a screened grid but one with an extra grid interposed between the filament and the normal control grid: a 4 volt positive potential applied to this extra grid largely nullified the retarding effect of the space charge surrounding the filament and enabled a larger anode current to be obtained. There is no reason why a valve should not operate with such low applied voltage, even though it may not work very well. Indeed many people had previously tried such a scheme with conventional triodes and achieved some modest success.

It is clear from their explanatory articles that neither Dowding nor Rogers had much grasp of valve or circuit theory and that they had evolved their design by 'cut and try' methods with all sorts of strange hook-ups until they found one that worked. Figure 1 shows, they say, the first Unidyne circuit with which they obtained really excellent results and they comment that "every possible means of coupling the anode circuit to the main grid circuit has been introduced both magnetically by means of the reaction coil and electrostatically by means of two variable condensers".

The authors say that the theory of the circuit is not difficult to follow; and then continue with an explanation which is largely erroneous, and at times vague, as when they say "The two-way switch is not essential, but a curiously great increase of signal strength is obtainable at times when it is in the left hand position and the variable condenser is brought across the potentiometer". Certainly I find it hard to make out the function of several of the components; and so it seems did the authors, for their idea of positive feedback via the AF transformer was later found to be of no benefit and abandoned in favour of the simpler circuit of Figure 2.

P.W.'s hype of the revolutionary Unidyne continued for many months into 1925, at the end of which they promised a 1926 Unidyne. Of course they suffered rather contemptuous criticism from other magazines and from some established engineers such as Marconi and Ambrose Fleming whom they tried unsuccessfully

ly to attract to demonstrations. They were particularly indignant at Marconi's comment that there was no novelty in the proposal and that "these circuits do not call for serious consideration". To compensate for this they wheeled out 73 year old Sir Oliver Lodge, their Scientific Adviser, who dutifully congratulated the inventors for a product "of remarkable simplicity and effectiveness".

Appearing in the same issue as Lodge's remarks was the illustration (Figure 3) of a two valve Unidyne made in P.W.'s laboratory, with the comment that "The whole of the wiring will have to be carried out very carefully". Well I suppose even a bird's nest does require some care!

The fame of the Unidyne crossed the Atlantic, in the guise of the Solo dyne to obviate British rights to the original name. Hugo Gernsback, Editor of Radio News in the United States wrote an enthusiastic editorial in 1924, concluding that "during the next few years the Solodyne principle will be adopted in the majority of radio receiving sets". But it

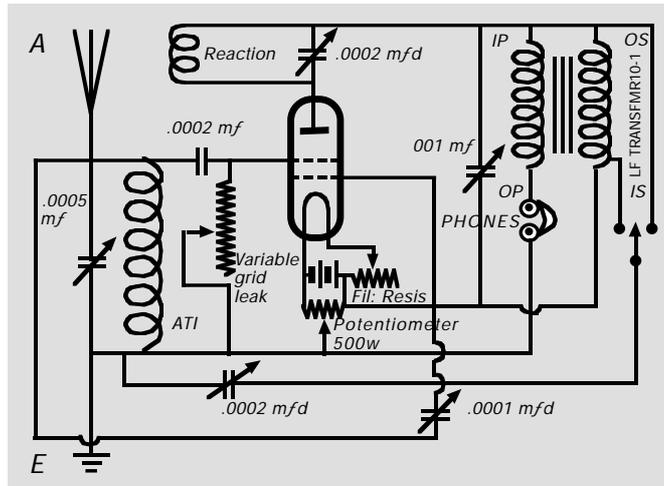


Fig 1

wasn't and neither was the Unidyne in England: little more was heard of the arrangement after 1925.

However brief its life, did the Unidyne really work? Well, yes it

did but not very efficiently. A valve, even a space charge tetrode, with very low applied voltages will pass little anode current and exhibit a low slope: but it will offer some gain and a receiver using this principle must be perfectly feasible.

For some time I have owned a French 4-volt bright emitter space charge tetrode (Bigril) and have wondered whether I could put it to some use. I couldn't do this very readily because its five pins have wider spacing than the normal European B5 base and I haven't got the special valveholder to suit. However, composing this article spurred me on and I made up a Unidyne receiver with the valve mounted on five of the 1920's-style individual valve pin sockets: the circuit is shown in Figure 2, except that I omitted the filament rheostat.

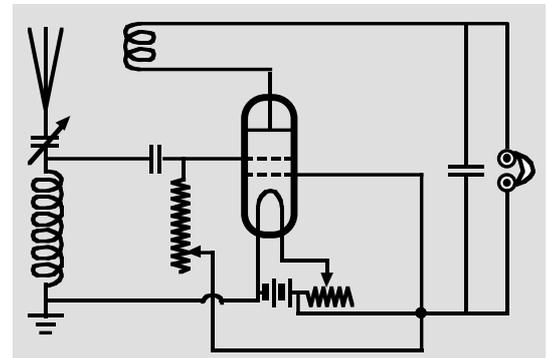


Fig 2

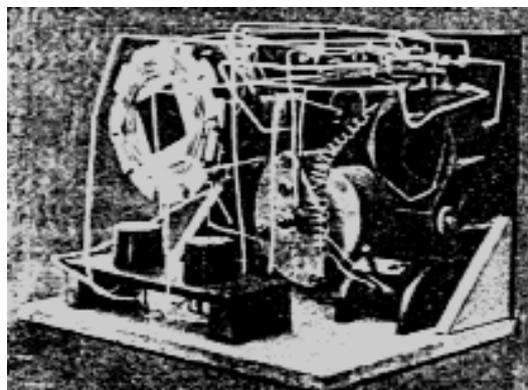


Fig 3  
The back of the panel with the aerial coil and H.F transformer in position.

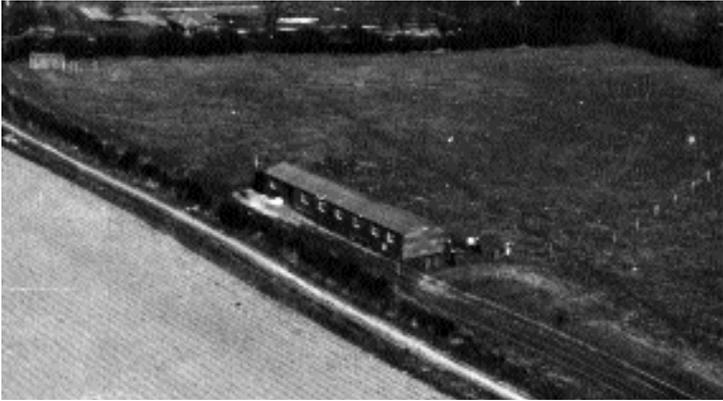
and that considerable control of regeneration is possible by use of it; but adjusting my IM SYMBOL 87 V "Symbol" control produced no discernible effect other than disabling receiver operation when set to a very low value.

There was a good article on the Unidyne by David Read in an early issue of the BVWS Bulletin. In this David gave comparative

sensitivity measurements for a crystal set and various forms of 1-valve configurations, showing the Unidyne to be about five times as sensitive as a crystal set, but more than six times less sensitive than a triode with regeneration and normal anode voltage.

So the conclusion must be that Unidyne was a brave effort and a good circulation booster for Popular Wireless, but could not compete with conventional valve circuits with normal HT supply and hence proved a damp squib in the long run.

## 2MT WRITTLE THE BIRTH OF BRITISH BROADCASTING



It may have passed many members attention but the next few years are going to see many centenary celebrations in the history of radio development and the Marconi company.

In addition few may have realised that by coincidence the next three years will also mark various 75th 'anniversaries' of the first years of British broadcasting.

Over ten years ago Tim Wander wrote his history of these fascinating times starting at the Chelmsford Marconi works under station MZX that included Dame Nellie Melba's historic performance. The book went on to detail the life and times of Britain's first regular radio broadcast station callsign 'Two Emma Toc'.

Located at Writtle in Essex radio station 2MT and its station manager Peter Eckersley became famous and their success led directly to the formation of the BBC.

'2MT Writtle - The Birth of British Broadcasting' was published in early 1988 and the first print run soon sold out. After much prompting Tim Wander has agreed to not only reprint the book in a new larger format but also to completely revise, update and correct the text in light of many years ongoing research. Several Chapters will be rewritten and a number of previously unknown

photographs have been uncovered.

The second edition will also have two brand new large appendices covering the formation and early history of the Marconi Hall street and New street works complete with many previously unpublished photographs of the interiors of these historic buildings.

Any member who can offer any comments or corrections, however minor to the original text or has any additional information (regardless of size), data, anecdotes, thoughts, photographs or even references that might enhance or amend the second edition are asked to drop Tim a line C/O PO BOX 2562, EARLS COLNE, ESSEX, CO6 2TA.

All contributors will be given full credit in the text which will undoubtedly become the new standard reference work on this period of radio history.

In addition Tim is putting together a initial interest list for members who might like a signed copy of the second edition at a special membership rate when it finally hits the streets. No obligation at all. Simply send an SAE to the above address and when it is all ready you will receive back full details.

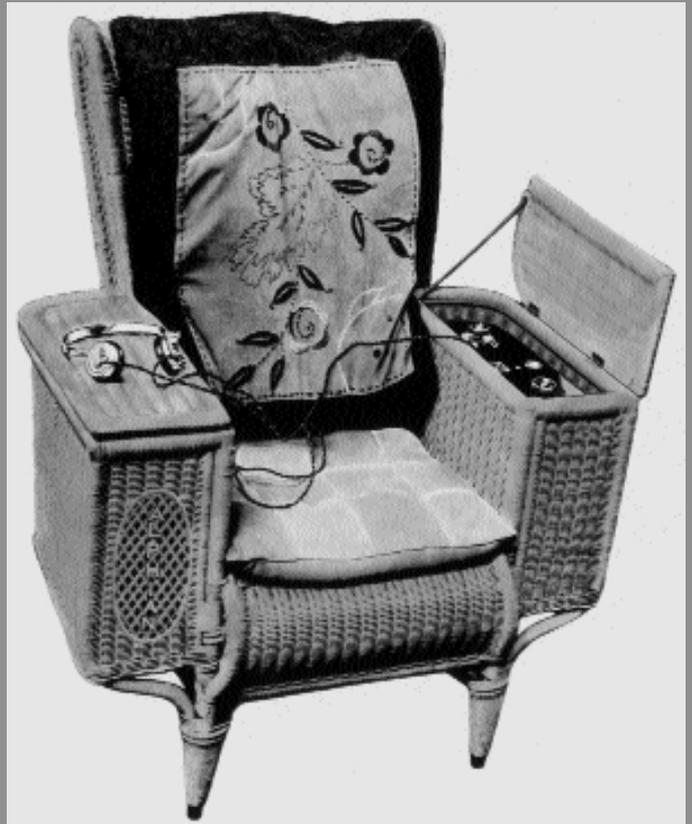
## ADEY AUCTION

The cover from Bulletin Vol 3 No.4 has been reproduced (below) to highlight an important collection of Adey sets that are scheduled to be sold by Philips (Bayswater) in their Mechanical Music, Cameras and Apparatus Auction on May 23rd. These Adey sets include a hand-painted, lacquered five valve three wave-band receiver, and two cigar box sets, one with "policeman's helmet".

For further details telephone 0171 229 9090.



Below: The Adey chair radio



# FOLLOW UP TO CRIPPEN

By Eric Westman

A detective story that finds a place in Vintage Wireless annals is that of Crippen, the first murderer to be caught through the medium of radio.

In 1910, Dr. Hawley Crippen, an American dentist practising in London, murdered his failed actress wife Belle Elmore and gave out the story that she had suddenly gone to America and died there. After being questioned by Scotland Yard's Detective Inspector Walter

Dew, Crippen and his young lover, Ethel Le Neve, fled, taking passage on the Montrose, a boat crossing to Canada. It was an unfortunate choice of ship, for the Montrose was very slow, and worse, it was equipped with wireless telegraphy. The ship's Captain, hearing of the hunt for the two fugitives through his wireless apparatus, and being suspicious of two of his passengers, a middle-aged man and a youth who looked remarkably like a girl, radioed his suspicions back to England. Immediately a detective boarded a much faster boat to Quebec, where he arrested Crippen as soon as the Montrose arrived.

Returned to England, the pair were tried for the murder of Belle Elmore; Crippen was found guilty and hanged; Le Neve was acquitted and freed. We all know the story so far, but what happened after that? Is the murder-house now happily occupied by people who know nothing of its grisly history, or don't care about it? Is it haunted? And what became of Ethel Le Neve?

No one ever again lived in Crippen's house: it remained empty for more than 20 years until destroyed by a German bomb during the Second World War. Ethel Le Neve, after her acquittal, crossed again to Canada. Later, she returned to England under a false name, got married, had children and became a grandmother. In 1967, fifty-seven years after Crippen's execution, she died in Dulwich hospital.

Detective Inspector Dew went on to complete an illustrious career. Some years after his death he was "resurrected" and used as the main character in a fictitious detective story that appeared both as a novel and as a television story.



# THE FIRST BROADCAST

A note by Pat Leggatt

It is well known that the first entertainment broadcast was undertaken by Reginald Fessenden when, on Christmas Eve 1906, he transmitted live music and speech, and music from a phonograph record, from his Brant Rock (Massachusetts) transmitter. The programme was heard by many ships' wireless operators who were said to have been startled by the event.

I have recently been reading his wife's biography of Fessenden published in 1940, and this gives one or two interesting details not usually quoted in other accounts.

Fessenden well knew that a continuous sine wave carrier was needed for satisfactory wireless telephony; and the carrier generator used for this transmission was a high frequency alternator built to his order by Alexanderson and others at the American General Electric Company. But as supplied it could produce a maximum frequency of only 10kHz and G.E. said it was not possible to

improve on this. Fessenden had specified 80kHz and was sure it was in fact possible to do better than G.E.'s effort: accordingly he scrapped G.E.'s armature and built his own, achieving the 80kHz he needed with a power of half a kilowatt. Spurred on by this example, Alexanderson at G.E. went back to the drawing board and later produced the alternators of greatly enhanced performance for which he is renowned.

On another point, by no means all ships' operators were startled to receive the Christmas Eve concert. Three days before the event Fessenden had notified his intentions to ships of the U.S. Navy and the United Fruit Company that were equipped with his 'liquid barretter' electrolytic detector receiving apparatus, so that they were ready to tune in at the advertised time and hear the broadcast. This also resolves the question of what sort of receiver the ships' operators were using which enabled them to hear the concert. The

electrolytic detector was capable of demodulating an A.M. signal, unlike the coherers which were in common use but suitable only for reception of spark transmissions. Furthermore, any ships in the area equipped with the Marconi magnetic detector would also have been able to receive the programme, for it too could demodulate A.M. albeit with a very high level of background noise.

There were reports of reception of the Christmas Eve concert from as far away as Norfolk, Virginia; and a repeat concert on New Year's Eve was heard in the West Indies. A few weeks before all this, in November 1906, wireless telephony speech tests between Brant Rock and Plymouth, Mass. had been heard in Fessenden's receiving station at Machrihanish in Scotland, the first transatlantic wireless telephony reception. Fessenden was truly one of the great wireless pioneers.



## B V W S A U C T I O N 1 2 T H M A R C H 1 9 9 5



The March Auction at Harpenden was an Incredible Success, breaking all previous records with a staggering 426 lots, raising approximately £1,850 for the society. The auction featured a very good spread of Vintage equipment indeed. Some pieces fetching quite reasonable prices. Among the notable items sold were a 20's bakelite Philips speaker with original box, a 1946

KB BM20 in vivid green bakelite, Several round Ekcoss (mainly AD36's) and some pre-war Philips TRF's.

Thanks must be given to Ron Deepröse and Terry Ransome for service beyond the call of duty, and to everybody involved in the smooth running of the auction.

Future Auctions may have to start earlier if this one is going to be an example of auctions to come.

### INTERNATIONAL NEWS NORWEGIAN FIELD DAY

The Norwegian Radio Historical Society (Norsk Radiohistorisk Forening) is going to hold its annual field day on May 20th, where they bring WWII vintage equipment out in the field and establish communication. This year they are including a 40 meter activity in order to establish contact with amateurs abroad. They will use the following schedule (time is in GMT):

- 3.510 Mhz, CW, 8.30 - 10.00
- 7.022 Mhz, CW, 7.00 - 9.00 and 10.30 - 11.30
- 3.690 Mhz, SSB, 10.00 - 12.00
- 145.550 Mhz, FM, 7.00 - 14.00
- 51.550 Mhz, FM, 7.00 - 14.00
- 51.600 Mhz, AM, 7.00 - 14.00

The station will use the call sign LA1D.

Which has a very interesting QSL card.

### MICHIGAN EXTRAVAGANZA '95

The Michigan Antique Radio Club will be holding its tenth annual 'Extravaganza '95' convention at the Holiday Inn South, Lansing, Michigan. which will run for through July 7th to the 9th. This convention is fast becoming one of the premier vintage wireless events in the USA. The three day flea market has spaces for 400 stalls alone, there are also auctions, talks, luncheons, a concert by the 'Geriatric Six Plus One', Equipment Contests and discount rates in the hotel for those wishing to be close to the action!

For more Information contact:

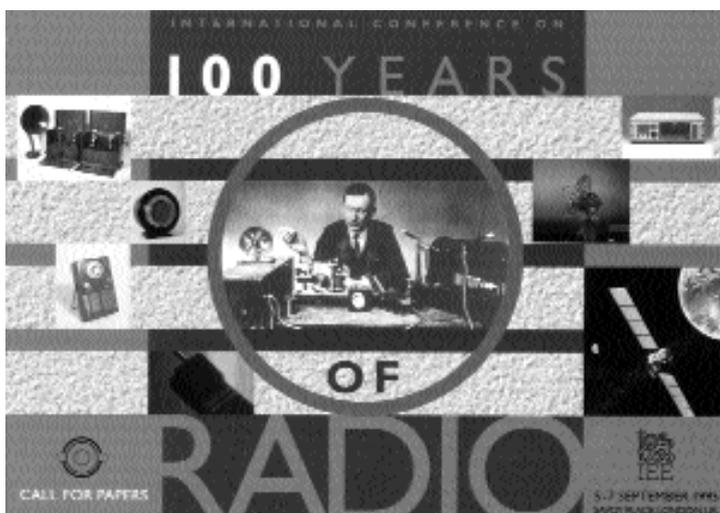
EXTRAVAGANZA '95

P.O. Box 585

Okemos, MI 48805-0585

USA

Don't forget if you happen to be travelling to the USA in the Summer, the Elgin annual convention in August (Chicago area) and the AWA annual September convention in Rochester (New York State). For Collectors and Enthusiasts alike, these conventions are not to be missed.



The Institution of Electrical Engineers are staging an international conference on '100 years of Radio', to be held during the 5th to 7th September 1995.

If you wish to find out more about the conference please contact: HYR95 Secretariat, Conference Services, Institution of Electrical Engineers, Savoy Place, London WC2R 0BL. Telephone: 071 344 5477, Fax: 071 497 3633, Telex: 261176 IEE LDN G, Email: conference@iee.org.uk

# THE LODGE N CIRCUIT

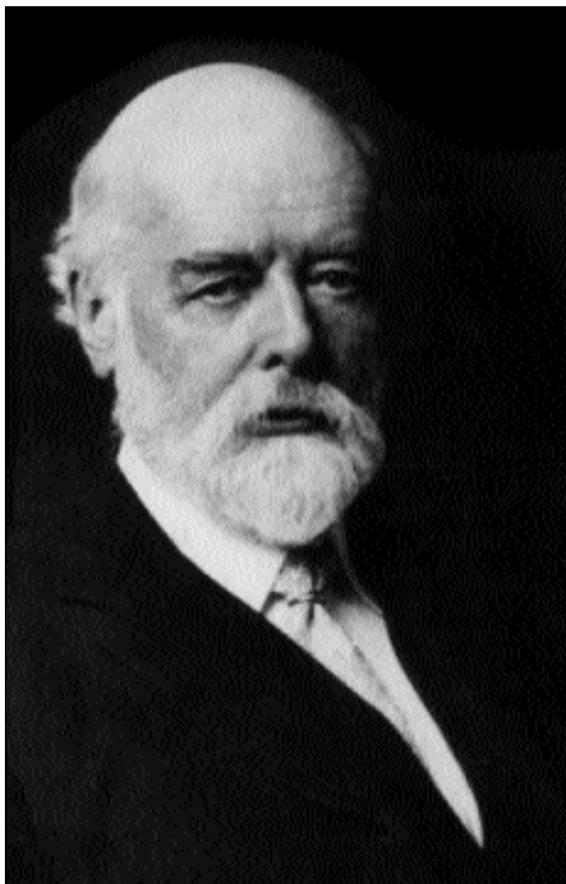
By *Trickle Charger*

Born in 1851, Lodge was something of a prodigy. He was appointed Professor of Physics at the age of 30; and at 36 he was elected Fellow of the Royal Society - the highest accolade in British science.

In 1897, following Clerk Maxwell's theoretical forecast and Hertz's practical verification of the existence and nature of radio waves, Lodge patented his invention of the concept of tuning, or syntony as he called it. This of course was of crucial importance in the development of radio and puts Lodge in with Clerk Maxwell and Hertz as the trio on whose work modern communications rests. The other important trio of innovators, Edison, Fleming and de Forest, are in a rather different category since none of them fully appreciated the true significance of what they discovered.

Following his syntony work, Lodge's other major contribution was his development of coherers. He was not the discoverer of the phenomenon, which had been first noted by Munk in 1835; but he, and others at about the same time, did indeed advance the coherer as the first usable radio detector.

After about 1902, Lodge played no part of much importance in radio development. But of course he wished to continue to be regarded as a leading expert in this field and in his later years accepted some rather low-level assignments, presumably to prop up his self esteem. In 1922 for example, when he was 71, he became Consultative Editor to Harmsworth's *Wireless Encyclopaedia*, a good publication in its way but aimed at the intelligent hobbyist and hardly a worthy vehicle for a leading scientist and Fellow of the Royal Society. He also undertook to be Scientific Adviser to the hobby magazine '*Popular Wireless*' (from the same publisher as the *Encyclopaedia*) contributing some rather ponderous articles on the principles of tuning and the like.



Sir Oliver Lodge

## The N Circuit

In 1926, when he was 75, Lodge and '*Popular Wireless*' evidently decided that some exciting new breakthrough should be put forward by the great man. Accordingly the magazine announced the Lodge N Circuit, titillating its readers for several weeks (and no doubt boosting circulation) with hints of an important disclosure to come, but revealing little or nothing of its nature.

At last, in the issue of May 29th 1926, readers were told what an N circuit was. To quote Sir Oliver, "...a circuit of high inductance and small capacity. Such a circuit responds just as freely as any other to a periodic disturbance of exactly the right pitch, but takes no notice of those with wrong pitch. Such a circuit I call an N circuit".

Further explanation mentions a need for very low resistance and minimal coupling to any other circuits. So the mysterious N

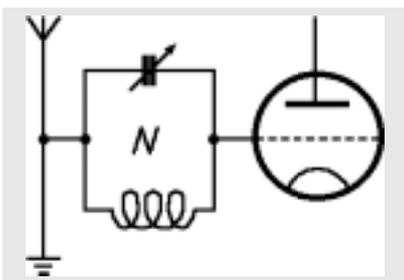


fig 1

circuit was nothing more than a resonant circuit of high 'Q' with little damping from external coupling. The claimed advantages were of course good selectivity and large magnification arising from the high 'Q' value.

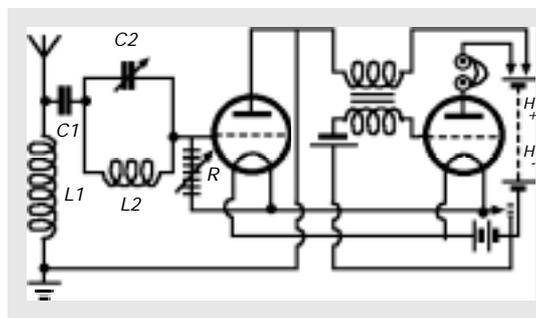


fig 2a

The magazine included a diagram showing the basic circuitry, copied

herewith as Fig. 1. This looks rather strange, but Lodge explains it to make everything clear (?). Despite the direct earthing of the aerial, aerial-earth currents will produce some magnetic field surrounding the aerial-earth wire which will induce the necessary 'disturbance' in the adjacent N circuit. This small disturbance, if of the right frequency, will be greatly magnified by the high 'Q' circuit. Lodge specifies that a small amount of regeneration should be employed to reduce the N circuit resistance to a very low value. He says "it is regenerated in such a way that anyone would say there was no regeneration at all".

Lodge continues

"Whatever regeneration there is should act upon the N circuit only. The aerial should not be in tune with it and, moreover, it should be so little connected, not really coupled, that it has no temptation to respond.

The aerial must have some tune of its own, since it is a conductor connecting two capacity areas, one the aerial, the other the ground; but if it is thoroughly out of tune, so as to respond, let us say, only to very much longer waves, it will be stimulated only by forced vibrations, which, being of the wrong frequency, produce hardly any amplitude of vibration.

There is in effect no re-radiation; the aerial is not acting as a transmitter. If there is any self-excitation in the station itself the howls produced will be limited to that station, and will not be transmitted through the aerial to other stations."

## Circuit

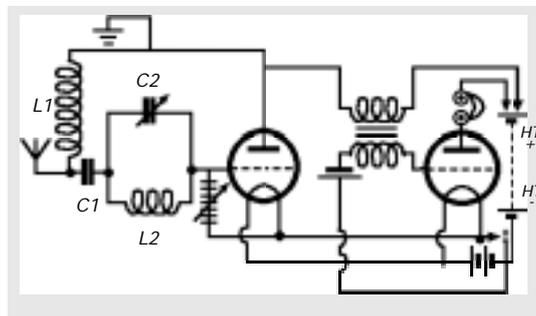


fig 2b

## Considerations

In the issue of September 18th, *Popular Wireless* showed the practical circuit of an N circuit receiver, reproduced here as Fig. 2a. The inclusion

of regeneration is not immediately obvious, but becomes clear when the circuit is slightly re-drawn as in Fig 2b when it can be seen to be basically a standard Hartley circuit.

The degree of positive feedback from anode to grid would depend on the impedance of C1 in series with the N circuit L2/C2, looking into the shunt impedance of the grid-filament capacitance in parallel with the grid leak R. The degree of feedback would also depend on how great is the self-capacitance of the LF transformer primary and the capacitance of the HT and LT batteries to earth: the greater the capacitances, the less RF will appear at the anode and the less will be the feedback to the grid. All in all the degree of feedback would depend on a number of rather random factors and the PW article says that oscillation should be controlled by adjustment of the variable grid leak and the filament rheostat. Referring back to Fig 2b, the aerial is connected directly to the Hartley circuit and the claim of "no effective re-radiation" if the set is put into oscillation seems hard to justify.

On another point, it is difficult to understand the exact operation of the N circuit L2/C2 itself. If this is the case that a large RF signal is developed across it then, since the anode is earthed, this large signal would be applied between grid and anode rather than between grid and filament; and the grid and filament, together with the LF transformer primary and HT and LT batteries, would be oscillating up and down at the radio frequency. It all sounds most improbable!

## Conclusion

So there we have it! The claims are for a high 'Q' tuned circuit with a little regeneration to improve it further: loose aerial coupling, offset by large amplification in undamped circuit resonance with attendant high selectivity: and little or no radiation from the aerial. But examination of the circuitry leads one to conclude that the people who devised the arrangement had no real understanding of what they were about; and indeed the PW authors wisely say "We do not propose to discuss the theory of the circuit in this article". It was clearly a Popular Wireless confidence trick which they hoped would be the wonder of 1926. Advertisements appeared for two and three valve N circuit sets made by the British arm of the American Cleartron Company; but it seems it was only a nine days' wonder, for the N circuit quickly sank without trace.

## LETTER

I agree with every word of the Geoffrey Dixon- Nuttall article on the Double Decca series of radios. I restored the 1939 version (BM58) and was greatly puzzled by the omission of compensating resistors to equalize the voltages on the valve filaments. After all the technique was well documented by the valve manufacturers. In the model I was working on the addition of three resistors puts everything right and removes the stress from the valves. It then dawned on me that this was while the set was switched to mains. When on battery the shunt resistors mean a small increase in battery current. I would hazard a guess that battery operation was seen as the major use at this time and it was probably too much to have battery manufacturers design for a different voltage rather than 1.5 volts.

As the article explains there were experiments with a floating battery, but it was not until permanent series working was adopted that things settled down. As most collected items will probably only be used on mains I recommend the installation of the filament compensating resistors - it is a simple trial and error job or you can use the values in later sets as a guide. I found that my restored BM5B had a really lively performance on all bands. Please take note of the safety issues and use an isolating transformer when working on the set.

One final note. The BM5B was one of the sets advertised for export in 1940 as part of the drive for foreign currency to feed the war drive. The mind boggles!

*Don Turner*

## National Vintage Communications fair

The fourth National Vintage Communications Fair will take place in the Pavilions hall of the NEC in Birmingham on Sunday 14th May, and will feature thousands of rare and collectable vintage technology items with special emphasis on early radios, television receivers, gramophones, telephones and classic 1950s hi-fi. In attendance will be over 300 specialist dealers from the UK, the Continent and the USA.

For further Information please contact:

Jonathan Hill, Organiser NVCF'95, 2-4 Brook Street, Bampton, Devon EX16 9LY. Telephone (01398) 331532.

## Further Harpenden meetings

More dates for your diary - mark them in now! Swapmeetings are coming up on Sunday June 11th, Sunday 24th September, and Sunday 26th November.

Please note carefully the return address which will be given for your Harpenden applications.

## Southborough meetings

The ever popular Southborough swapmeet is being held on October 15th, John Howes is also holding his usual Audio Jumble on July 16th. For more information please contact John Howes at: 11 Crendon Park, Southborough, Kent TN4 OBE (Tel: 01892 540022)

## Date to remember

Gerald Wells' garden party at the Vintage Wireless Museum is on the 10th of June, for details telephone 0181 670 3667

## Bulletin Index

The Bulletin Index is currently available up to issue 20/1 and is a complete cross reference of authors, subject matter and main articles back to the beginning of the society.

## New Articles

If you have anything interesting to say concerning Wireless, Television, broadcasting etc. please send it to the Editor for possible future publication in the BVWS bulletin, as the bulletin is only as interesting as the articles that comprise it. We welcome all suggestions and comments regarding the new appearance of the bulletin and hope that it is catering towards your needs as a collector / enthusiast / historian. Your article can be just a few paragraphs long as long as you think it conveys its' message across to your fellow members.

Also if you have any photographic material that would look good in the bulletin, don't hesitate to post it to the Editor

Please send all articles typed and / or on floppy disc to:  
Carl Glover, c/o BSS, 1 Rothsay Street, London SE1 4UD



*The Braun T1000 Showing control panel*