# RADIO BYGONES

£2.40
ISSN 0956-974X

No. 8 – Christmas 1990

## A Radio Bygones Collection in North Yorkshire


**Although there were portable radio receivers around in 1922, it's more likely that anyone wanting music whilst they picnicked would take along a wind-up, acoustic gramophone like this Decca, with a selection of their favourite 78rpm records.**
**It is reputed that this particular model was developed from one used to entertain the troops in the trenches in World War I**

# MUSEUM PIECES

This month featuring items selected from the personal collection of Peter Cutler of Poole in Dorset

**In 1954, the Vidor 'Lady Margaret' CN429 4-valve MW/LW 'all-dry' portable radio might well have provided entertainment for a picnic. Promoted by Vidor Ltd. as being 'in feminine colours, and no larger than a lady's handbag', it measured 4 x 8 x 8in with the lid closed. The receiver switches on automatically when the lid, containing the frame aerials, is raised**

RADIO BYGONES

# Christmas 1990
# Issue No. 8

**Published 27 November 1990**
**ISSN 0956-974X**

**Editor**
Geoff Arnold
I.Eng FIEIE G3GSR

**Administration**
Barbara Arnold

**Editorial, Subscription and Advertisement Offices**
Radio Bygones
8A Corfe View Road
Corfe Mullen
Wimborne
Dorset BH21 3LZ
England

Telephone:
Broadstone (0202) 658474
(International
+44 202 658474)

Printed by
The Friary Press Limited,
Dorchester, Dorset

**On our front cover – a view of Gerry Baker's collection**

*(see page 16)*

First of all, my apologies to you all for the late publication of this issue of *Radio Bygones*. As many of you will already have heard, I suffered a heart attack back in September. This put me in hospital for a short while, but having started on what the doctors term 'an unremarkable recovery', I have been able gradually to return to the preparation of material for this issue.

There have had to be one or two minor changes to the content, due mainly to the medical limitations imposed on my 'gadding about' the countryside in the early days of recovery, but I'm glad to say that all the principal items promised are here. Future issues will follow on at two-monthly intervals after this one.

---

Have readers noticed the recent phenomenon of a new word in use in newspaper, radio and TV reports to describe more or less anything to do with radio communication – 'airwaves', as in 'on the airwaves' or 'via the airwaves'. I suppose it's a useful, all-embracing word for use by reporters who (as is generally the case) know little or nothing about radio technology, but it's a term which I personally find vaguely irritating, and I wonder where it came from.

By coincidence, I recently embarked on a search for a new dictionary to replace my favourite *Chambers Twentieth Century*, which is becoming somewhat dog-eared and battered and is, I was amazed to discover, seventeen years old! A lot of new words have come into being in that time, though I suppose not too many of them are in the vintage radio field. Also, quite a number of existing words have been hijacked to mean something quite different from what they did when I was a lad.

I duly visited a local bookshop, hoping to meet a new 'friend' on which I could rely in years to come. There I found six different dictionaries in brand-new 1990 editions. Leafing through them one by one to find out what each might offer in return for its price-tag, one of the words I chose to check was 'airwaves'. With interesting results!

Three of the six did not even mention the word. Among the other three there seemed to be some divergence of opinion as to exactly what it means, with one claiming that it refers exclusively to transmissions from radio and TV stations operating in the broadcast bands, but the other two including all radio transmissions in their definitions. Not one of them said where the word had come from. Can anyone out there throw some light on the matter?

***Geoff Arnold***

## In This Issue

# News & Events

## A Sad Loss

Devotees of the history of radio and related topics who are familiar with the name David Pritchard as an author of books and magazine articles, will be sorry to hear of his death following a short illness earlier this year.

An article by him on early airborne radio telephony appeared in *RB* No. 6, but he is perhaps better known for his researches into the development of radar and radio-navigational aids in Germany up to the end of WWII. His series 'Battle of the Beams', published in *Practical Wireless* in January – March 1988, attracted world-wide interest, whilst his book *The Radar War*, published by Patrick Stephens Limited in 1989, was a fascinating account of the technical and political background to German radar, beginning with their experimental work on centimetric systems in 1904.

Aside from his historical interests, David was also a keen radio amateur (G4GVO), and for some time prior to his death was working on a book which had been intended to serve as an introduction to the hobby for new recruits.

I never met Dave Pritchard face to face, although I had known him for several years as a voice at the other end of a telephone. My lasting impression was that he was without question one of Nature's true gentlemen. We send sincerest sympathies to his widow in her sad loss.

***Geoff Arnold***

## BVWS

The British Vintage Wireless Society was formed in 1976 to promote and study all aspects of wireless history and to encourage preservation and restoration of vintage equipment. They have seminars, swapmeets and exhibitions as well as a quarterly magazine which comes free with the subscription.

Further details available from **Robert Hawes, 63 Manor Road, Tottenham, London N17 0JH, telephone 081-707 2838**. Send an SAE with postal enquiries, please.

## Information Please!

Brian Faulkner, author of the article 'Coast Radio Stations – the First Sixty Years' published in *Radio Bygones* Issue No. 6, is researching material for a book detailing the history of UK coast radio stations. He would welcome any anecdotes or information that readers might have on the subject. Please write to him at **17 Quillet Road, Newlyn Coombe, Penzance, TR18 5QR**.

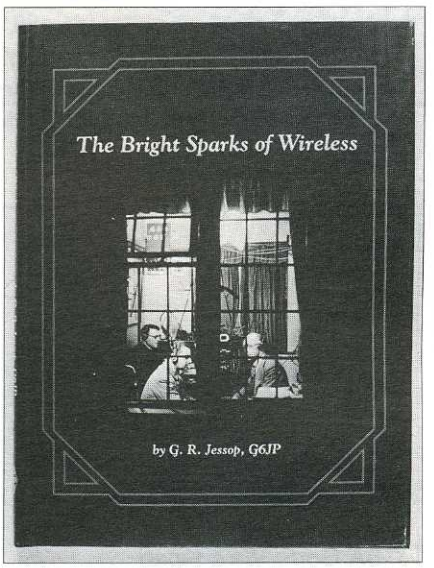
## *QTC*

Readers wishing to purchase a copy of the most interesting book on the past, present and future of ship-to-shore radio communications, *QTC (I Have a Message For You)* by 'Sparks', reviewed in *Radio Bygones* No. 7, should note the following additional and changed information for readers in the United Kingdom.

Sterling cheques in payment for UK orders should be made payable to Raymond P. Redwood, and sent to Barclays Bank, 12 High Street, Great Dunmow, Essex, quoting Capital Account 0074-2597 **(note change of Account Number)**.

All orders should go direct to Sequoia Press TX, 2502 Cockburn Drive, Austin, Texas 78745, USA, with a note of the details of the payment sent to Great Dunmow.

*QTC* is now available in both hardback and paperback editions. Prices are £10 and £7 respectively for despatch via surface mail (transit time to the UK 6 – 8 weeks), and £20 and £15 respectively via airmail.




## New Book

Anyone with an interest in the history of experimental radio will find information, photographs and reminiscences to fascinate them in a new book entitled *The Bright Sparks of Wireless*, written by George Jessop G6JP, and published by the Radio Society of Great Britain.

A most enjoyable book, described perfectly by the blurb on the dust-jacket: '*The Bright Sparks of Wireless* covers the heritage years of amateur radio from Marconi to the "secret listeners" of 1939/45. This was the period when radio amateurs were real experimenters. It was they who laid the foundations of circuits and procedures which all radio users now take for granted. They started with the spark gap, steam generator and coherer and ended with crystal detectors, integrated circuits and superheterodyne receivers.

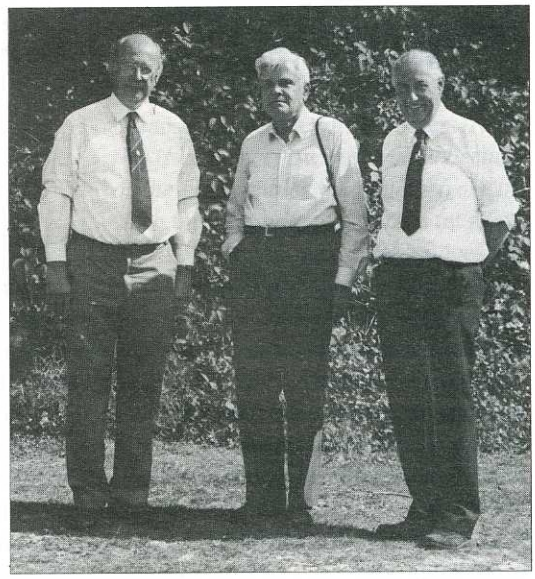
The book traces the development of circuits and aerials and presents them in context with the personalities and incidents of the period. It adds detail and human interest to the bare bones of history of this formulative and exciting period of amateur radio.' The book ends with a reproduction of the 1914 List of Experimental Wireless Stations.

*The Bright Sparks of Wireless* is in hardback, with 96 pages 244 x 183mm. It is available by post from RSGB SALES, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE price £10.85 (£9.22 to RSGB members) including post and packing.

*Geoff Arnold*

# Empire Broadcasting – A Celebration at the Amberley Chalk Pits Museum

*by Joan Ham*



*Geoff Arnold, Henry Hatfield and Ron Ham (l. to r.) at Amberley on September 2*

'I want to give Britons overseas a bit of England. I am sure that it will be feasible'.

Those ambitious words were said to the Press by Gerald Marcuse about 65 years ago, at a time when it was exciting even for home-based Britons to tune in the early wireless programmes from the new British Broadcasting Corporation. Concerned that people at home should receive a satisfactory service, the BBC rejected repeated demands for broadcasting to the Empire on the grounds that it was not practical. They were unwilling to spend licence money on what they considered to be a dubious undertaking.

The demand was sparked off by the popularity of PCJJ, a Dutch station broadcasting to their colonies; newspapers and the technical press were publishing letters and columns debating why the BBC did not do the same. Gerald Marcuse was well-known for his experimental broadcasting which had already achieved some notable records in the early 1920s. He had found and contacted the Hamilton-Rice expedition exploring the Amazon, and long out of touch with their base; Gerald had passed messages between them and the Royal Geographical Society in London. He sent concerts of speech and music and conducted the first two-way wireless press conference with the American aircraft carrier *Seattle* during a voyage from Honolulu to Australia and New Zealand. This led him to the certainty that Empire Broadcasting was possible and wanted.

He ran a series of experiments and invested large sums of his private funds in the project. Then he collided with an official brick wall. The BBC refused him permission to re-broadcast their programmes, claiming that it would infringe copyright. Gerald was not one to accept defeat and arranged to broadcast live material using artists who volunteered to help; the Columbia Gramophone Co. provided recorded music and a private studio was made available to him, linked to his transmitting station by two rented telephone lines. The Post Office issued a licence on 1 September 1927 for a six-month period using 1kW of power and wavelengths of 23m and 33m.

An illustrious cast crowded the studio for that first historic broadcast. It included Capt. Ian Fraser MP, Sir Granville Ryrie the Australian High Commissioner, Mr Arthur H. Brooks of The Columbia Gramophone Co., Miss Daisy Kennedy, a well-known violinist, and Mr Lloyd from Australia House among others. Empire Broadcasting was successfully launched, and enthusiastic reports and congratulations poured in from all over the world.

Sixty-three years later, on 1 and 2 September 1990, the blaze of red-white-and-blue and a flying Union Jack drew the attention of Amberley Chalk Pits Museum visitors to a special weekend exhibition commemorating this landmark in broadcasting history. A display of graphics began with the state of broadcasting, the available stations which the cat's-whisker twiddler might be able to pick up and a pictorial explanation of short-wave reception around the world. This was accompanied by a contemporary crystal set, headphones and microphones including the Marconi-Reisz marble, one of the types actually used by Gerald for his broadcasts, and a large heavy 'coffin' BBC microphone. A 1920s world map (with the Empire picked out in red) showed with flags and red ribbons, the routes and distances covered by Gerald's signals, and other graphics panels showed copies of some of the archive material stored in the museum library – letters, press-cuttings, licences and the first detailed log from Australia of the historic broadcast. The display was supported by crystal and valve wireless sets, large batteries and accumulators which would have been their power supply and a nostalgic array of early components with which 'father' would have built the family wireless set.

In addition to this, a slide show ran continually showing pictures of Gerald, his equipment and station. A tape recording of his voice accompanied the exhibition, reminiscing with an old friend about the early days of Empire Broadcasting.

Just like that first occasion, we too had our distinguished guests. The September sun was warm as we sat at museum picnic tables and drank tea with Mrs Irene Marwood and David Marcuse (Gerald's widow and son), Geoff and Barbara Arnold (*Radio Bygones*), Dick and Peggy Ganderton (*Short Wave Magazine*), Henry Hatfield (past-President of the BAA) and his wife Sue, and Myles Eckersley (son of Capt. Peter Eckersley, first Chief Engineer of the BBC).

The Post Office also had its representative in the person of our colleague and co-donator of the museum wireless collection, David Rudram (with an unbroken 40-plus years service as a telephone engineer).

Just to complete the picture, we had by sheer coincidence a contingent of Dutch visitors to remind us that PCJJ had been the trigger that fired off the first Empire Broadcast.

All that was lacking was the power to communicate across time! **RB**

# Magnetic Wire Recording Machines

*by Bob Ridley*

Having read with great interest the article 'History of Magnetic Recording' by F. C. Judd, which appeared in Issue No. 2 of *Radio Bygones*, I decided that a long cherished project should be finalised. During a visit to the Science Museum, South Kensington in 1981, I noticed that the section devoted to recorded sound appeared lacking in examples of wire recording machines constructed by British manufacturers. The item that was of particular interest to me was a machine from the USA manufactured by the Armour Research Foundation of Chicago. Having spent some years of my youth being concerned with the manufacture of a similar machine, I decided that it may be interesting to forward some further information to the Museum. Correspondence showed that very little in the way of information or samples of British machines appeared to be available. A subsequent letter to the then *Wireless World* (December 1981) brought forth a fair amount of information. Regrettably, due to moving house and other domestic commitments, the project remained more or less dormant until reading the article by Mr Judd.

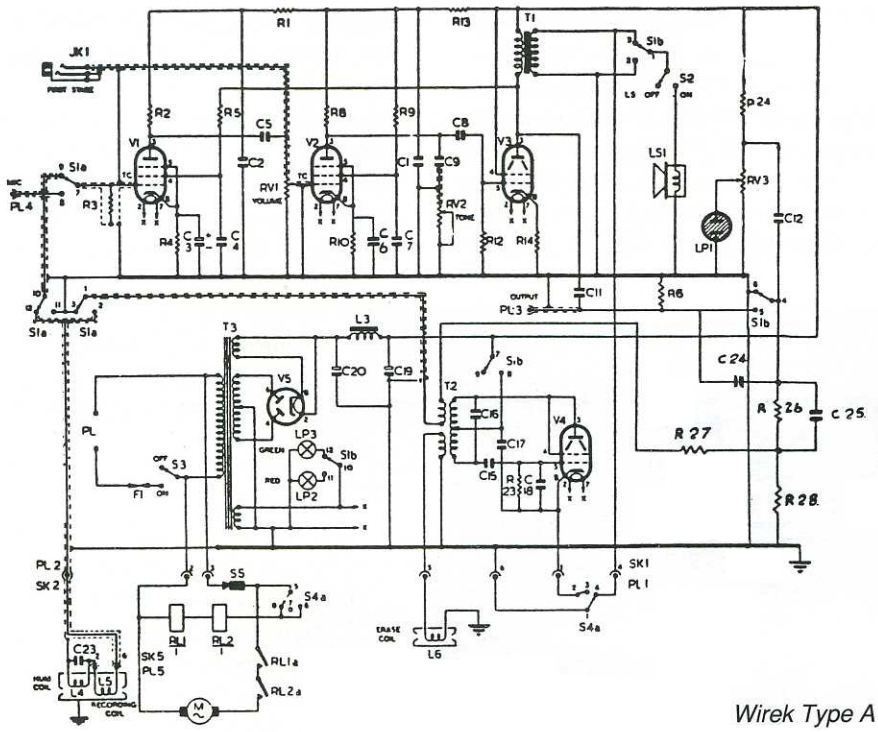
At this point, perhaps it would be wise if I explained that the wire recording machine was in many ways the precursor of the modern tape recorder. The recording medium was a stainless steel wire, four thousandths of an inch in diameter, which travelled across the recording head at the now almost unbelievable speed of 24 inches per second! Broadly speaking, with the obvious exception of mechanical arrangements, the machines operated in exactly the same way as the modern tape machine. The advent of the magnetic recording tape medium after the end of World War II heralded the demise of the wire recorder, for tape was so much easier to handle. The 'birds nest' that invariably formed when a wire snapped simply had to be seen to be believed; normally it was almost impossible to sort out. The wire would then have to be cut and joined by the highly scientific method of tying the ends in a reef knot – crude but effective. The mechanical design of the machine also gave rise to added complications in relation to 'spool stacking' of the wire.

In the late 1940s, to the best of my knowledge, the largest manufacturer of wire recording machines in Britain was Wirek Electronics Limited of Deansbrook Road, Edgware, Middlesex. The address may be familiar to those readers who are musically minded as that of the home of the well known musical instrument makers Boosey and Hawkes, of which the Wirek Company was a subsidiary. As far as I can ascertain, Wirek Electronics produced three machines, Types A and B and the Type 49. A considerable amount of manufacture was dealt with by sub-contractors. For instance I happened to be concerned with electronic units which were produced by Associated Electronic Engineers Limited of 10 Dalston Gardens, Stanmore, of whom more later. All machines were made under licence from the Armour Research Foundation of Chicago, Illinois, USA. The Type A machine was designed for professional and military usage whilst the Type B, which was definitely inferior in design, was produced for the domestic market. The Type 49 was a specialised recording-only machine for use in aircraft.

## Type A

The Type A came in two units contained in a strong metal case finished in black crackle paint (see photograph). The mechanical section contained the single motor, spool drive and stacking mechanism, function selector, recording head and counters. Interestingly the counters were calibrated minutes on the left and seconds on the right. The whole unit was very well built using aluminium castings, all in battleship style. The two guide bars that can be seen near to the spools took care of stacking and tracked by means of a continuously threaded lead screw, similar to that found in multiplier fishing reels. The two large pulley wheels kept the wire in contact with the recording/playback head and also controlled wire tension. The head had a fine groove cut into the metal section over which the wire travelled. Motor functions gave fast rewind and recording at 24 inches per second, no fast forward function being allowed for.

The electronic section was built to a similar standard, very robust mechanically and utilising the best quality components of the time. The controls comprised volume, tone, function selector, loudspeaker switch and mains on/off switch, and there were indicators for power on, recording, and recording level (neon). Input sockets gave access to the



*Wirek Type A*

microphone pre-amp and 1st stage amplifier. The valve line-up was mic. pre-amp (6J7), 1st amp (6J7), output (6V6), oscillator (6V6) and rectifier (5Z4).

The chassis was heavily cadmium plated steel, with the mains transformer, choke, output transformer and oscillator transformer – all of massive proportions, very well constructed and fully impregnated – together with the valves, mounted above the chassis. Capacitors, resistors, etc., were all mounted on Paxolin tag boards to facilitate easy servicing. All connections were by means of a laced cable form. The complete unit must have weighed in at something over 50 pounds and measured some 12 x 12 x 16 inches when complete in its box, which also contained the mains lead and a moving coil microphone.

## Usage

The Type A was in the main used by professionals such as the BBC. Some were sold to Red China, many were used by the military and intelligence services for such diverse applications as recording intercepted radio traffic, prisoner interrogations, and aircraft talk-down from control towers by the RAF and Fleet Air Arm. Indeed for that particular purpose a number of Type As were produced which incorporated a VOX unit (voice-operated switch), utilising a thyratron and a Post Office Type 2000 relay. One of the more esoteric applications was using the machine as a device to measure decayed fission products, where the wire was passed through an electrostatic precipitating chamber and then in front of a shielded Geiger counter.

The machines really hit the headlines when eight of them were installed in a mobile recording van especially designed and manufactured for use at the Olympic Games held at Wembley in 1948. The unit earned the nickname 'The Octopus'. The Octopus was designed and constructed by Mr J. R. Miller, who at that time was a member of the BBC's Recording Maintenance Unit. The requirements were to provide simultaneous recording of eight commentaries. The starting and stopping of machines was to be controlled by the commentators, and a talk-back facility between commentators and the van engineer used the commentator's microphone as talk-back loudspeaker. Also operation was to be provided from both mains and battery supplies.

In order to provide these additional facilities, an extra playback head was fitted to the machines. The DC supply power unit consisted of a vibrator unit supplied by Valradio Limited of Feltham, Middlesex, which gave an output of 230 volts at 50c/s, 150 watts. A special STC 4021 microphone, complete with cue light, return cue switch and machine-state indicator was also supplied. The cabling allowed the commentator to operate up to 150 yards from the van.

The van is mentioned in *BBC Engineering, 1922 – 1972* by Edward Pawley, as follows:

'A curiosity of the post-war decade was the multiple mobile recording unit. Familiarly known as the Octopus, because of its eight wire recorders *(Note: this is incorrect; it was so called because of the eight cables emanating from the van)*, this unit was constructed (at a cost of £4650) for the European Services and made its first appearance at the 1948 Olympic Games. Several commentators of different nationalities could record their accounts of the same event simultaneously. The recorders were medium quality machines made by Wirek Electronics Ltd under licence from Boosey and Hawkes. In 1953 they were replaced by Ferrograph tape recorders.'

## Type B

The Type B machine was a very different beast. Very much made for the domestic market, two basic models were produced, remarkably, the B1 and the B2. The only difference between them was that the B1 was fitted with a crystal gramophone record pick-up and in the B2 this was omitted.

Of the two basic types a number of variations exist. In some, the electronic selection switching was carried out by means of a bank of push-buttons and on others rotary Yaxley type switching was used. Again, the recording speed was 24 inches per second and the rewind speed was 12 to 15 feet per second. Mechanically and electronically the Type B machines were much inferior to the Type A.

A very large mains-powered synchronous motor drove a flywheel which gave a constant speed of 78rpm to the take-up drum (on top of which a gramophone record could be placed), drawing the wire from the supply spool and through the record/playback head, which moved up and down on a cam system to provide even stacking of the wire on the take-up drum. Again, no fast forward drive was provided, only 'Forward' for recording and playback, 'Neutral' which disengaged all driving shafts, and 'Rewind' which declutched the take-up shaft and engaged the supply spool shaft to give a high-speed rewind. The motor control system was designed around a rotary control and double Bowden cable.

The controls comprised a bank of

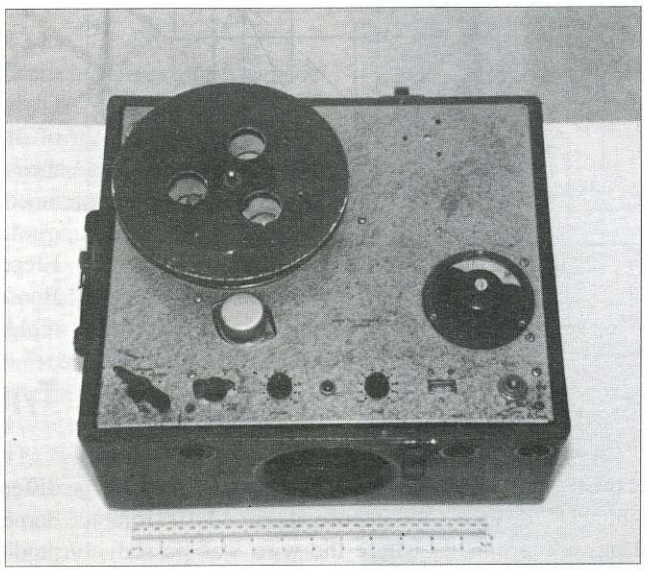
selector buttons, divided into three sections: (a) record or listen, (b) input selector – microphone, wire, disc, radio, (c) stop or start. In addition there were volume and tone controls, a neon lamp level indicator, a loudspeaker on/off switch and a mains indicator lamp. Some variations had a mechanical counter fitted and dispensed with the 'speaker on/off switch.

Power consumption was 75 watts. With all accessories the Type B weighed 39 pounds and measured 16½ x 14 inches by 9 inches deep. The valve line-up on earlier models was 6V6 oscillator, 6J7 pre-amp, 6SN7 buffer/amp, 6V6 power amp. The DC voltage for the motor control relays was derived from a bridge rectifier connected directly to the mains supply input. In later models the valve line-up changed to a pair of 12AU7s, a pair of 6AU6s, a single 7C5 and a pair of 6X4 full-wave rectifiers. One of the rectifiers appears to have taken the place of the earlier diodes, which at that time would almost certainly have been selenium, not very reliable at high voltages. Also the smell from a blown selenium rectifier could clear a large area in a few seconds – once smelt never forgotten!

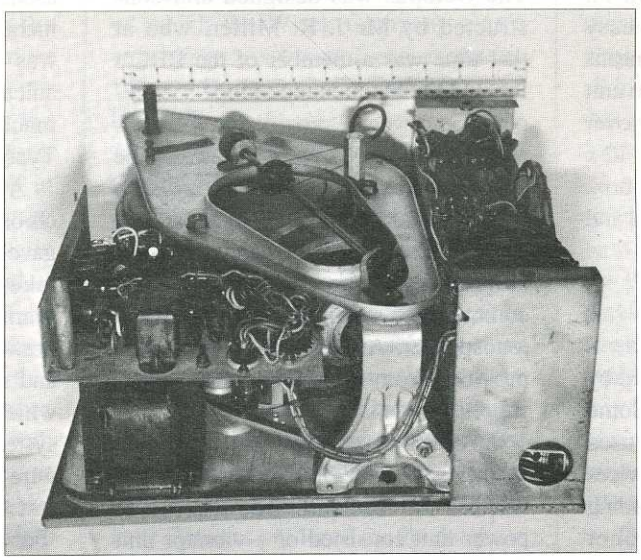
Mechanically and electronically the Type B machines were quite crudely constructed, when compared with the Type A. The Type B machines were not manufactured by Associated Electronics and I have been unable to obtain any information to identify the manufacturers.

The last machine to be produced by Wirek Electronics that I have been able to identify was the Type 49, Services Type 4185. I assume that the number 49 refers to the date of development or first production. The machine was designed for use in aircraft and was capable of recording data or speech signals. No playback facility was provided, this being carried out at the aircraft's base. An example of this machine is now held at the Science Museum, South Kensington. Regrettably I have no further details, other than that it appears to have been a form of early 'black box' flight recorder.

Although the use of wire as a recording medium became redundant with the advent of tape, wire still retained its popularity in the field of dictating machines, where the small physical size of the reels of wire made a very compact machine possible. Yet again, however, the manufacture of the mini-cassette tape heralded the total demise of the wire medium.



*A Wirek Type B2 recorder. The take-up drum is at the top left, with the recording head below it and the spool holder to the right. The pattern of three holes towards the top right were used to secure the gramophone pick-up arm in the Type B1. The record was placed on the take-up drum. An internal view of the Type B2 is shown below. The machine in these photographs was presented to the Science Museum, South Kensington, in May 1990*



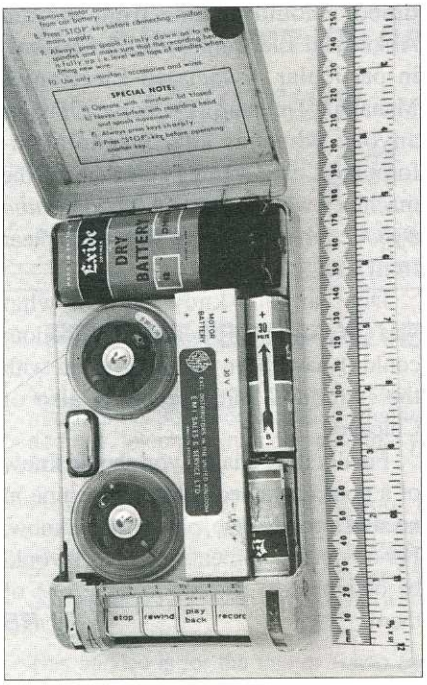
## Minifon P55

Probably one of the last dictating machines to use wire was the Minifon P55, manufactured by Protona GmBH of Hamburg, West Germany. The period of production would have been in the middle 1950s, and the construction and design were a perfect example of Teutonic thoroughness. It measured 7 x 4 inches by just over 1½ inches deep. Power was provided by three dry batteries: a single 1.5V cell for filaments, a 30V for the anodes and a 12V for the motor. The valves used were a pair of XFW40 and a single XFY43 or XFY54. These were just about the last development of the thermionic valve. Less than a quarter of an inch in diameter and about an inch in length, with flying leads emerging directly from the tube pinch, they were quite a little masterpiece and capable of being incorporated in very small areas. However, as we all know, with the arrival of the semiconductor and later the micro-chip, the day of the thermionic device was more or less over.

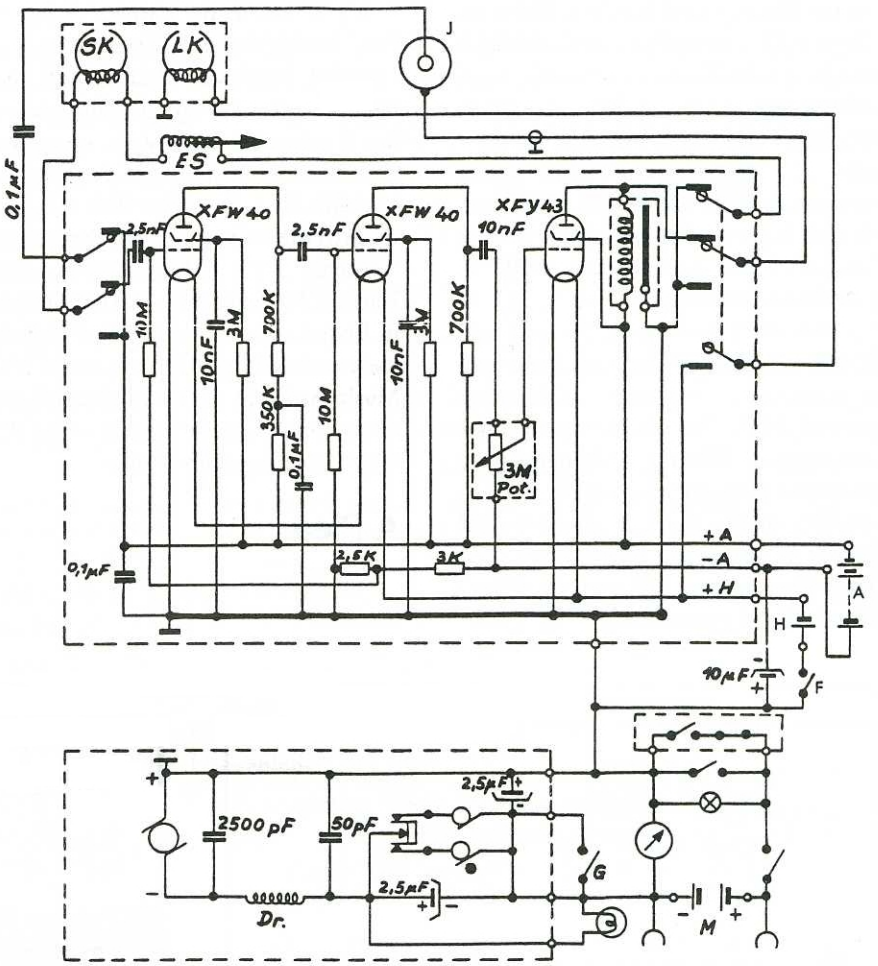
The P55 incorporated many novel features. Two recording speeds were provided: slow, 23cm/second, for speech and fast, 34cm/second, for music, with a rewinding speed of up to six times that of the recording rate. Accessories available are an indication of the attention to design detail – a rechargeable motor battery, normal crystal microphone, a table microphone/loudspeaker combination, a moving coil microphone, a throat microphone for use in noisy conditions and, most intriguing of all, a very sensitive crystal microphone built into a dummy wrist watch. A stethoscope set of headphones could also be obtained, a mains operating unit that replaced the motor battery or miniature accumulator, a suction cup induction pick-up for use on a telephone, a foot switch, and a connecting plug for use on a car cigar lighter socket.

Speed control of the motor was by means of a centrifugal governor. The motor itself was a 5-slot, drum-wound armature with an Alnico 400 field magnet.

The controls comprised four keys:




*The Minifon P55*




record/play-back/rewind/stop, a volume control and a speed change switch. There were indicators for on/off (light above meter), battery level and recording time (a mechanically driven bar).

Stacking of wire was achieved by means of the recording head being raised and lowered by a cylindrical groove cam. As will be seen from the circuit diagram, the valves were wired as triodes and no oscillator was provided. Erasure was achieved by fully saturating the wire using an electromagnet placed next to the record/playback head.

The unit had a very nicely made leather case supplied and weighed 1¾ pounds. A considerable difference to the Wirek machines! One reel of wire could record for 300 minutes on the speech setting or 200 minutes of music on the appropriate setting. In all a most interesting and advanced design for the period. The machine was solely imported and sold in Great Britain by EMI Ltd, and Protona were able to offer world-wide service facilities.

## My First Job

My own interest in wire recording dates back to the late 1940s, when after leaving school I obtained employment with Associated Electronic Engineers of Stanmore. At that time the company was engaged in the manufacture of high grade transformers for the electronic industry, concentrating on audio output, small power and specialised input and matching transformers. A small section of the factory manufactured low quantity production runs of high quality electronic equipment, and one of the runs happened to be for the electronic section of the Wirek Type A recorder.

The company, for the period, were most progressive and working conditions were very good. Frequent meetings of a management/worker committee took place in order to solve any problems relating to productivity and quality. A bonus scheme based on profit-sharing operated and all employees were entitled to two weeks holiday with pay and also two weeks paid sick leave. We even had a subsidised canteen. In all a pleasant and happy company, due to a progressive and efficient management.

## Further Investigation

In a vain attempt to obtain production figures and any other information concerning Wirek Electronics, I contacted Messrs Boosey and Hawkes, only to find that they were virtually unaware of the Wirek Company due to a disastrous fire at the Deansbrook Road factory, when practically all of the records had been destroyed. However, they were very interested in this facet of the firm's activities and much to everyone's surprise, a Type A machine was discovered sitting in a cupboard under a flight of stairs at their London showroom, quite undisturbed for some 25 to 30 years, no-one having the slightest idea what it was.

Boosey and Hawkes very kindly invited me to go to Edgware and have a look and much to my surprise I found that it was in mint condition. It was quite exciting to see one of the old machines again. I can assure you that it took a great deal of cajolery from the Boosey and Hawkes representatives and mutterings from me about what happens if it blows up before, in great trepidation, I gave it a sniff of mains voltage. No tell-tale bangs or smoke signals.

I then decided to go for the jackpot, switched to listen, started up and then to the amazement of everyone the sound of Stanley Holloway reciting one of his monologues could be heard with reasonable clarity. At this stage I decided that I had chanced my luck sufficiently and switched off. I understand that the machine is now in honourable retirement

in the Boosey and Hawkes Museum. Regrettably I found that I seemed to have reached a dead end in obtaining such information as to numbers of various machines produced, prices, customers and any further anecdotal detail concerning the use of the machines. Wirek Electronics had been out of business for many years and, as previously mentioned, practically all records were destroyed. My old employers, Associated Electronic Engineers appeared to have gone out of business around 1981. The Directorate of Sales and Support, Ministry of Defence were unable to give any information at all. A number of the Type A machines did come onto the surplus market about 1954 when Messrs Henry's Radio of Edgware Road offered them for sale at £25 each.

My letters to the Armour Research Foundation were never answered or returned. However, every cloud does have its silver lining, and my letter to the *Wireless World* brought some very useful information to light. I would like to thank Mr J. R. Miller who was able to provide the detail regarding the 'Octopus', Mr T. E. Battershill of AERE Harwell, Mr Tony Ware of Mickleburghs in Bristol who was able to let me have the use of a P55, and Jenny Keen of EMI Music Archives who very kindly found a copy of the service manual of the P55 which has proved invaluable.

## A Plea

As you can tell, there are many lines in this story that still need to be tied and tidied. Should anyone from the old Associated Electronics or Wirek firms, in particular Associated Electronics Managing Director Mr George Gray, or anyone who has any anecdotal information concerning the usage of the machines wish to contact me via *Radio Bygones*, I would be delighted to hear from you.

Does anyone know who or what was the Armour Research Foundation; could it have been anything to do with the Armour Meat Company, also of Chicago?

Finally if by chance you should know of a poor unwanted Type A machine in need of a good home, please let me know. For obvious sentimental reasons I would be delighted to be able to have one of them. ***RB***



## Fancy That...

'If singers' voices seem to wobble, remember that the wobble may be in your receiver or loud-speaker.'
*From* The BBC Year Book 1931

## FREE READERS' ADVERTISEMENTS

You can advertise your goods for sale or wanted, using up to a maximum of 30 words including whatever details of your name, address, telephone number, etc., that you wish to be published in the advert.

Please ensure that you write your advertisement clearly, preferably in block letters or typewritten, and include the corner flash cut from the current issue of *Radio Bygones*, (see below). Every advertisement sent in **must** have your full name and address attached, even if you do not want those details published in full.

This service is for the use of *Radio Bygones* readers for their private sales and wants only. Any advertisements from traders, or apparent traders, will be rejected.

**SEND YOUR ADVERTISEMENT TO:**
**Radio Bygones, 8A Corfe View Road,**
**Corfe Mullen, Wimborne, Dorset BH21 3LZ,**
**marking the envelope 'Readers' Advert'.**
The closing date for adverts to appear in our next issue, due out on 29 January 1991, is January 10.

### WANTED

R1082/T1083 motor-gen, starter, etc. WS19 rack. Gee-H MkII mouse units. Any info or parts for AI Mk VIII scanning unit Type 4. Swap B2 for scanner! Phil, Guildford (0483) 572653.

Radio equipment as fitted to police Ariel Leader motorcycles in the 1960s to complete a restoration. Cossor 105 handset, radio TX/RX, speaker or similar equipment. Phone Roger James on Chesterfield (0246) 207706.

R1155, 'N' preferred, good working order with P/U and AF stage. Good price paid for good example. J. R. Hardcastle G7EML, 8 Hunger Hills Avenue, Horsforth, Leeds LS18 5JT or phone 0532 584903.

Very low frequency (2000 – 3000 metres) receiver or converter. Also wanted Transmatch ATU. G4XFF, 37 Harewood Crescent, Old Tupton, Chesterfield or phone 0246 864012.

Vintage communications receivers – Eddystone, Hallicrafters, Racal, Marconi, HRO. Taylor, 27 Christopher Way, Emsworth, Hants.

Dial for Philco 'People's Set' LW,MW,SW dark type. Back for Bush TV22 9in bakelite TV. Russell Atkinson, 1 Lingmoor Rise, Heron Hill, Kendal, Cumbria LA9 7NP.

1929/1933 home constructed amateur two or three valve receiver and transmitter. H. L. Schonher, 4312 Greenridge Dr., Columbus, GA. 31909, USA.

Trio SP-180 external speaker with selectable audio filters, to complete station line-up. Particulars to J. H. Lepper G3JHL, 'Turlington', Salisbury Road, Shootash, Nr Romsey, Hants SO51 6GA or phone 0794 512283.

Early wireless equipment, Marconi Yearbooks 1918 – 22, Fleming and other early valves, correspondence with collectors of similar. Marc Gottlieb, Box 1112, South San Francisco, CA, USA 94083-1112.

For restoration of Wells-Gardner BC348Q RX – output transformer Part No. 155A/B, block capacitor Part No. 70A/B, CW oscillator module No. 9A1596, mounting brackets for power plug and fuse-holder, or defunct RX containing these parts. Also knobs, switches, pots, jacks, etc. Phone Neil on Uxbridge (0895) 30006.

Fullerphone; also Power Buzzer; operator's pocket watch for R109. Send price required to Taylor, 89 Lion Road, Twickenham, Middlesex TW1 4HT or phone 081-891 2820 evenings.

For restoration: WS46 – coil sets, transmit switch, power plug: WS18 – receiver local oscillator coil, microphone, power plug. Also spare valves, accessories, complete or incomplete sets. Trevor Sanderson, Hull (0482) 867327.

Blue Arcturus radio valves, especially 10, 50 and PZH. Valves S22, VS24K, NR17/CV1155. Contact with owner of Marconiphone audio amplifier model P6 made c. 1926. Philip Taylor, 14 Willow Walk, Canewdon, Rochford, Essex SS4 3QH, or phone 0702 258598.

TS-175U frequency meter. Must be in good electrical/physical condition with original charts. Also handbook/service manual for RT-34/APS-13 airborne radar. K. W. Perfect, Littleton House, Pipe Ridware, Rugeley, Staffs WS15 3QL, phone 088-922 319 or FAX 088-922 291.

Majestic Baton and any service information for a Grundig 'Hastings' 3D Sound, 2035W/3D/GB. Phone Steve Banks on Luton (0582) 419154.

Military radio handbooks, user and technical, British, American, German, Russian, etc., any language. Also books on Royal Signals, good price paid. Also wanted, Wireless Set No. 11, B47 and A13. Bob Warner, 45 Eastry Close, Ashford, Kent TN23 2RS, phone 0233 636185 evenings.

### FOR SALE

Tektronix 546 oscilloscope, CA dual-trace plug-in, some info, gwo £35. RCA AR88LF RX, gwo £35 or swop for Murphy B41 LF RX. CRTs VCR97/138 and Cossor 89, believed OK, £5 each. Buyers collect please. Phone Neil on Uxbridge (0895) 30006.

R390A in good condition, case mounted with handbook, £275. Also aluminium rack frame unit, 5ft high on castors, £25. Would consider swaps for an SSB adaptor, Drake equipment or w.h.y. Phone S. Beamish on 081-995 9867 (evenings only).

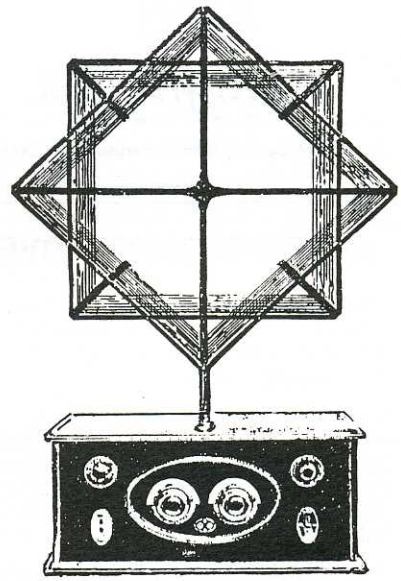


RB No. 8 READERS ADVERT

# The Coming of the Superhet

## Part 1 – The First Wave

*by Lorin Knight MIEE G2DXK*



*The Burndept 'Ethodyne' 7-valve superhet (1926)*

Edwin Armstrong conceived the idea of the supersonic heterodyne receiver (or superhet as we know it today) early in 1918, when he was a major in the US Army and stationed at the Signal Corps laboratories in Paris. He was confronted with the need for receivers which could resolve very weak signals from German spark transmitters operating on frequencies between 500kHz and about 3MHz.

With only triode valves available, and neutralisation techniques not yet invented, it was difficult to build an amplifier which would give any significant gain at 500kHz, let alone 3MHz. He therefore hit upon the idea of obtaining the required gain and selectivity at some fixed lower frequency, such as 100kHz, and transforming the incoming signals to this intermediate frequency with a conversion circuit which would work quite happily up to 3MHz. After some experimentation a working 8-valve receiver was built using this principle – but the war then ended and the laboratories in Paris closed down.

Back in the USA as a civilian again, Armstrong, together with a few other radio enthusiasts, continued to experiment with the idea but his invention remained virtually unknown in Britain until 1921. In February that year the first written account of Armstrong's work was published in the *Proceedings of the IRE* and later, in December, the superhet made a brief historic appearance in Britain during the Transatlantic Tests arranged by the ARRL and the Wireless Society of London (later to become the RSGB). The purpose of these tests was to see if American radio amateurs (operating on wavelengths of around 200 to 300m) could be received in Britain and it was a visiting American amateur Paul Godley, with his 10-valve superhet and a massive Beverage aerial array close to the Atlantic coast in Scotland, who logged the largest number of transatlantic stations (28 in all). The British amateurs, however, were delighted to find that signals from America could be received using much simpler receivers with much simpler aerials and few of them seemed to take much interest in Godley's superhet.

It was not until 1923 that interest really started to take off here. That year *The Wireless World* published a series of articles which explained the principle of the superhet receiver and gave constructional details for building one. It was also the year in which several radio manufacturers, most notably RCA in America, awoke to the commercial possibilities of the superhet and started to develop versions suitable for broadcast reception.

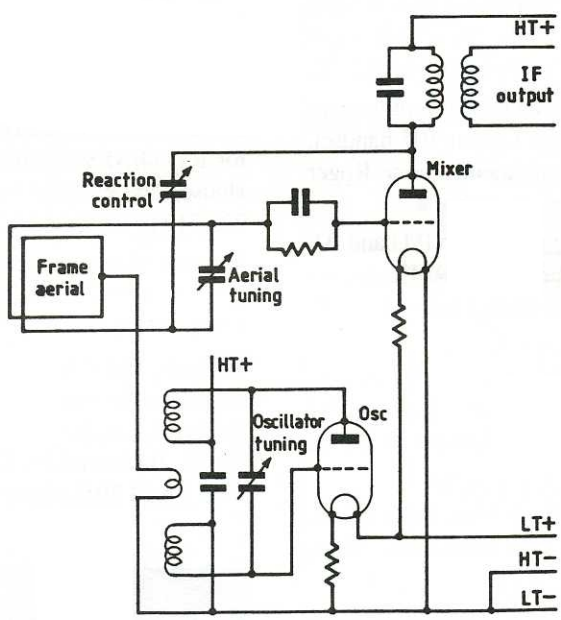



*Fig. 1.1 - Typical frequency changer, 1925 – 26*

The first commercial superhet arrived on the British market in 1924. It was produced by the Western Electric Co. Ltd. (later to become Standard Telephones) and was their Model 44002. The years 1925 and 1926 saw superhets being produced by a number of British companies, including GEC, BTH, A. J. Stevens and Co., BSA, Beard & Fitch, Peter Curtis, Autoveyors, Eagle Engineering, Burndept and McMichael. Several companies, including McMichael, Western Electric, Bowyer-Lowe and Marconiphone, marketed superhet kits for the home constructor.

Like the straight sets of that time, these superhets were all battery operated. Some were self-contained portable models, having a built-in loudspeaker, frame aerial and battery compartment. Others required a separate loudspeaker or headphones – but even these all seemed to come with a frame aerial, which was typically about two feet square and often made so that it could be folded up like an umbrella. (The frame aerial was a legacy from Armstrong's original receiver, which had been designed primarily for direction-finding service.)

## The Circuits

Armstrong's original set had a two-valve frequency changer, three 100kHz IF stages, a leaky-grid detector and two AF stages – eight valves in all. Most of the early commercial superhets followed

the same general pattern, although some had only two IF stages and some had only one AF stage.

The circuit of a typical frequency changer is shown in **Fig. 1.1**. The mixer was, in effect, a leaky-grid detector and indeed the mixer stage was then universally known as the first detector. The frame aerial and the oscillator both fed into the mixer grid and the IF signal was taken from the anode. In this particular example the mixer was made regenerative in order to improve the selectivity of the frame aerial circuit and increase the conversion gain. However, the use of regeneration was not universal.

McMichael deviated from the norm by using a more elementary frequency changer circuit, known as the autodyne, which required only one valve. It consisted simply of an oscillator, with the frame aerial coupled into the grid circuit and the IF extracted from the anode.

Marconiphone went down to 43kHz and Bowyer-Lowe went up to 150kHz. **Fig. 1.2** shows the circuit of a typical IF amplifier of the day. The first transformer, T1, had its primary tuned with a fixed capacitor and was commonly known as the filter. The other two transformers, T2 and T3, commonly known as the intermediate couplers, were self-resonant at approximately the same frequency but had a much lower effective *Q*. Receivers with three IF stages had an extra intermediate coupler. There was usually no way of adjusting the resonant frequency of a transformer and the normal practice seems to have been to select matched sets. Indeed, manufacturers always avoided being specific about the intermediate frequency, using phrases such as 'about 3000 metres.'

The Burndept 'Ethodyne' superhet, which had two 50kHz IF stages, was somewhat unusual in that it did not have the normal filter, but had three identical low-*Q* self-resonant transformers. These had laminated iron cores, the positions of which Burndept adjusted to control the resonant frequency. Each transformer presumably had an effective in-circuit *Q* of somewhere between 5 and 7, which would have given an overall IF response somewhere between the two curves in **Fig. 1.3**. The Marconiphone kit, which had two 43kHz IF stages, also used identical iron-cored self-resonant transformers throughout. The Eagle Electric 'Chakophone' portable, which had three 75kHz IF stages, had the normal air-cored filter followed by three iron-cored intermediate couplers.

Armstrong's original set was designed for telegraphy reception only, and had tuned air-cored 100kHz transformers throughout – plus regeneration. The bandwidth must have been quite narrow!

The IF gain was usually controlled by a potentiometer which varied the bias on the grids of the IF valves, as in Fig. 1.2. The Western Electric Model 44002 had a somewhat cruder gain control. Each of its three IF stages had a switch which allowed the gain to be reduced (presumably by switching the grid return to LT– instead of LT+) and one had to control the gain by manipulating these three switches.

The IF gain control normally served as the volume control for the receiver, although some sets additionally had some rudimentary means for varying the AF gain. For example, in the Curtis portable superhet, one of the two AF stages could be switched out and, in one GEC model, there was a switch which selected different taps on the secondary of one of the AF transformers.

In some sets the detector (or second detector as it was then called) used a leaky-grid circuit such as in Fig. 1.2. Others had an anode-bend detector.

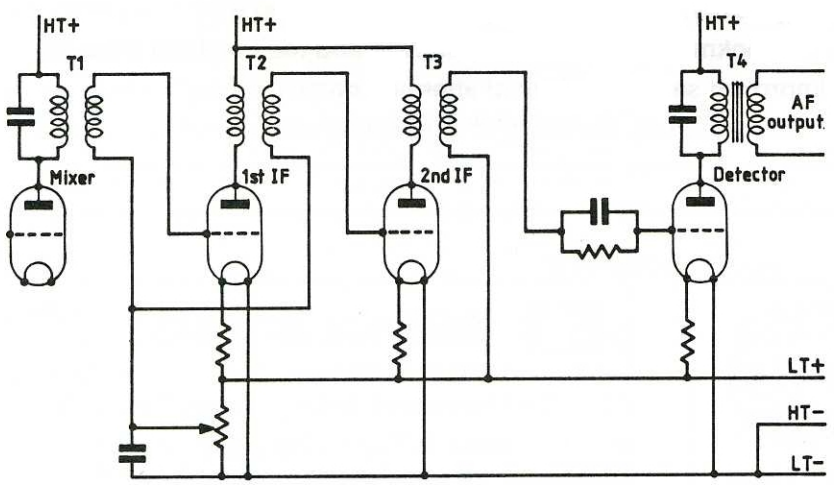



*Fig. 1.2 - Typical intermediate frequency and detector stages, 1925 – 26*

The tuning controls for the frame aerial and the oscillator were always quite separate and had to be adjusted separately. The tuning scales were marked in degrees and had a slow-motion drive giving a reduction ratio of somewhere between 8:1 and 18:1. Often the tuning dial had a blank area on which one could pencil in one's own marks to indicate station settings. The Curtis superhets had a fold-down flap equipped with writing surfaces, on which one could make notes about dial settings.

Most sets had provision for long-wave reception but this often involved using a different frame aerial and/or coil changing.

The most common intermediate frequency seems to have been 100kHz but

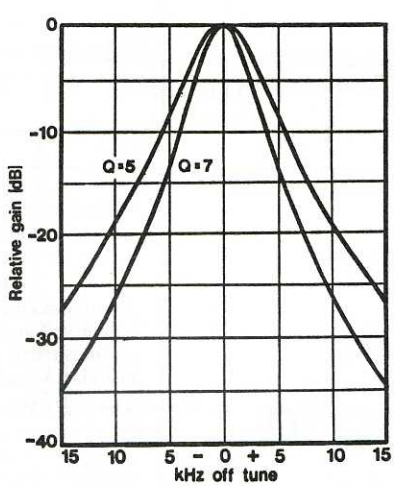



*Fig. 1.3 - Calculated response of a 50kHz amplifier having three identical tuned circuits*

## The Problems

These early superhets had outstanding sensitivity and adjacent channel selectivity compared with the straight sets of the day but they had some problems unknown to the straight set. For a start, every signal could be tuned in at two separate points on the oscillator dial, once with the oscillator on the high side of the signal and again with it on the low side. A strong signal might be tuned in at other points as well, such as when, for

example, the frequencies of the oscillator and a harmonic of the signal were separated by the intermediate frequency. Such spurious tuning points were particularly likely to be found if the signal was overloading the mixer, or if the oscillator had excess feedback and was producing a distorted waveform. After 2LO started to transmit from the new 2kW transmitter in Oxford Street in April 1925 (the aerial system was the subject of 'Where is it?' on page 29 of *RB* No. 6), some Londoners with superhets having a below-average standard of design found that they could receive that station at 10 or more different points on the oscillator dial!

There was also the problem of image (or second channel) interference. With such low intermediate frequencies, and just one circuit tuned to the signal frequency, image rejection was not very good and it was quite common for a weak signal to suffer interference if there was a strong signal on the image frequency. There were certain steps one could take to combat such interference. For example one could try tuning the oscillator to the alternative frequency or one could try rotating the frame aerial – but this all helped to make tuning an even more complicated business. Even if the image interference was not serious enough to mar reception of a weak station, it often gave rise to an audible whistle which changed in pitch as one tuned through the station.

There was another phenomenon allied to image interference. One could sometimes hear one's local station breaking through if one tuned to a station 100kHz (or whatever the IF was) away. This would happen because the signal reaching the mixer grid from the local station was strong enough to act as if it were a local oscillator and was producing a spurious IF signal which carried the composite modulation of both stations.

These early superhets had two other characteristics which detracted from their appeal. First, they were considerably more expensive than straight sets and, secondly, the quality of reproduction was inferior, due to the IF response curves being far from ideal and causing attenuation of the higher audio frequencies.

Now it so happened that, concurrently with the development of the superhet, other developments had been making it much easier to amplify signals at their original frequency and, as a result, the need for converting them to some lower frequency became less imperative. Thus, as the shortcomings of the superhet were becoming more and more apparent, the TRF was becoming more and more attractive. Enthusiasm for the superhet declined as quickly as it had grown and by 1928 not a single one was being produced in Britain.

**Several years were to elapse before the superhet regained any popularity. In 1930, the second high-powered BBC transmitter at Brookman's Park came on the air, and the resulting need for improved selectivity turned attention once again to the benefits of the superhet. The story of this revival will be related in Part 2**

# First Use of Radio in a Marine Emergency

*by Jeff Harris*

'As soon as the EPIRB (Emergency Position Indicating Radio Beacon) hit the water it began transmitting on the 406MHz emergency frequency. The information was picked up by the INMARSAT satellite and relayed to the Norwegian receiving complex at Eik. The alarms sounded at once and within minutes the SAR (Search and Rescue) authorities responsible for the area in which the incident had occurred had all the relevant facts.'

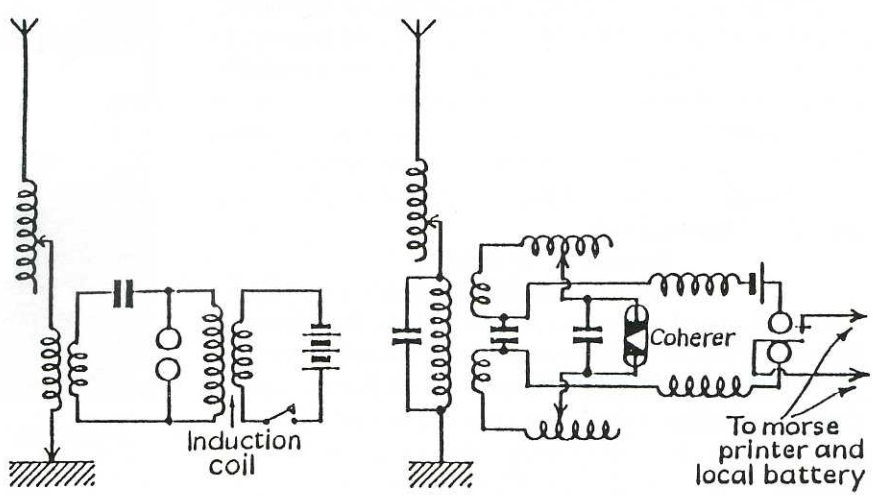
A typical scenario of the 1990s, but a hundred years ago things were a little bit different ...

The year 1899 had started off badly at the South Foreland Lighthouse, a few miles east of Dover. The new electric generators had been causing some trouble and now Mr Bullock and the Italian chap, Marconi, had started installing the new wireless equipment. Mr Core had received instructions from Trinity House headquarters to give every assistance to the men carrying out the work, but it certainly disrupted the normal tranquil day to day running of a 'light'. 'Call it wireless' Mr Core might have said to John Hall, one of the assistant keepers 'I've never seen so many wires in my life!'

One of the few authorities to see the possible use of wireless in its very early days, at a time when the new system was subjected to much ridicule, was Trinity House. A number of installations were undertaken by the Wireless Telegraph and Signal Company (the name 'Marconi's Wireless Telegraph Company' was not used until 23 February 1900).

Two of these installations were at the South Foreland Lighthouse and the East Goodwin Lightship (51° 13'N 01° 36.3'E). The previous four years had been very busy for the new wireless company and their operations as both hardware and service providers were beginning to take shape. Wireless had progressed from being a scientific curiosity to a system that at last was being seriously investigated by a number of authorities.

The equipment installed both in the Lightship and at the Lighthouse would have been of the same basic type. A spark gap transmitter operating over the usual wide range of frequencies and a receiver having the coherer as the basic component. At this stage in the development of radio, tuning was in its infancy and although Marconi had some success using HF transformers, the equipment was to say the least unselective.




*Circuit diagrams of typical Marconi transmitter and receiver of 1900*

The *R. F. Mathews* was quite a large schooner-rigged steamship with a gross tonnage of 1964, a length of 270ft and a breadth of 35ft. She had left Newcastle-on-Tyne a few days prior to 28 April 1899 with a cargo of coal bound for Genoa. The weather had been quite good but as the vessel entered the eastern end of the English Channel on the morning of April 28 a dense fog enveloped the area. The master of the *R. F. Mathews* made insufficient allowance for the tidal drift and ran into the East Goodwin Lightship. The new radio equipment now was about to make history. Let the newspapers of 29 April, 1899 take up the story:

'Utility of Wireless Telegraphy Proved.
Lightship disabled and in Danger.
Instantaneous Communication with the Shore.
Captain Interviewed across Space.
**A REMARKABLE TEST.'**
*(London Daily News)*

**'LIGHTSHIP DAMAGED.**
Report and Interviews by Wireless Telegraphy.
The Captain's story.'
*(Daily Chronicle)*

'Wireless telegraphy.
**UNREHEARSED DEMONSTRATION.'**
*(Morning Post)*

The report in the *Morning Post* reads as follows:

'In a dense fog in the Channel yesterday morning the East Goodwin Lightship was run into by the steamship *R. F. Mathews*, 1964 tons of London outward bound from the Thames. The Lightship is one of four vessels marking the Goodwin Sands and is that which has been fitted with one of Marconi's installations for wireless telegraphy. The vessel is situated about 12 miles to the north-east of the South Foreland Lighthouse where there is another installation, and is about ten miles from the shore, directly opposite to Deal.

**Using the New System**

Information of the collision was at once communicated by wireless telegraphy from the Lightship to the South Foreland Lighthouse, where Mr Bullock, assistant to Signor Marconi, received the following message: "We have just been run into by the steamer *R. F. Mathews* of London. Steamship is standing by us. Our bows very badly damaged." Mr Bullock at once communicated with the Trinity Authorities at Ramsgate.

**The Captain's Narrative**

Captain Clayson, Master of the Lightship, communicated to the South Foreland by wireless telegraphy the following account of the accident: "We number seven hands all told. Fortunately none of us was hurt, but we all had a very severe shaking. There was very dense fog when the collision occurred, and we had a very narrow escape from being cut in two, as the vessel nearly caught us broadside on. We had just time to put our helm down and let the tide swing the ship a bit, otherwise the steamer must have run right through us. As it was she gave us a violent glancing blow across the bows. Our stem is completely smashed down to the water line, and the covering boards and plank ends on each side of the stem are started. The ship hung onto us, and our vessel scraped along one side of the steamer, giving us a severe grinding, and carrying away our upper works and plating above the water. The ship is very badly damaged, and, but for the fact that the sea was calm, and has remained calm since, we could not have kept afloat. The steamer remained alongside to see whether we required assistance, and subsequently proceeded down Channel, having herself sustained damage. Before the steamer left we told the Captain that we had telegraphed to the South Foreland, and they had promised to send aid if we required it. The cause of the vessel running into us was that she did not make sufficient allowance for the tide, which was running very strong at the time. The Lightship is so badly damaged that she must be replaced, and we are waiting for the Trinity boat *Warden*, which is on her way up Channel from Beachy Head with the Superintendent on board. She is bringing with her another Lightship to replace us and tow us back."

Asked whether they had any difficulty in getting communication with the South Foreland Lighthouse when the accident happened, Captain Clayson replied: "I had not the slightest trouble. The collision occurred at half-past eight. I called the South Foreland up about two minutes after the steamer got clear of us and while she was still standing by, and I got the reply immediately from Mr Bullock, to whom I telegraphed briefly the particulars of the collision."

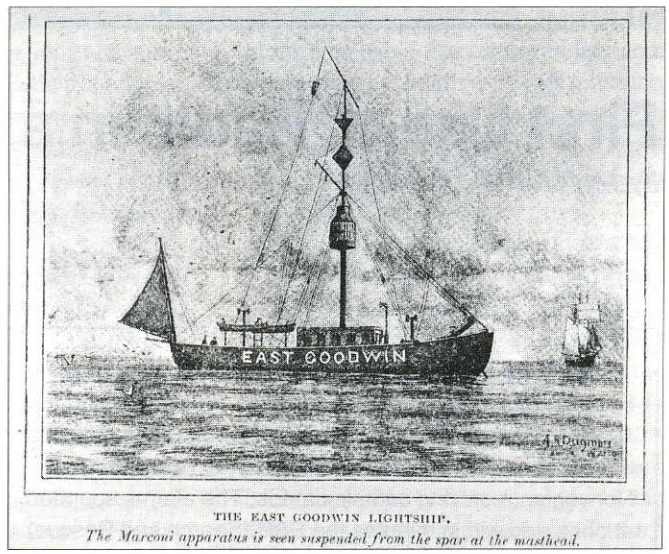
**Method of Communication**

Mr Bullock informed a Correspondent that he was on the premises when he heard the alarm bell ringing, and on going to the instrument found it was the Lightship communicating. He at once transmitted particulars of the message received to the Trinity Authorities at Ramsgate, and it was further arranged that if the Lightship required immediate assistance the Lighthouse people should telephone to Ramsgate, Deal and Kingsdown for the lifeboats to be sent out.'

**'Lessons of the incident.**

From our naval correspondent.

The collision of a merchant steamer with the East Goodwin Lightship is a matter which has for the first time brought into practical prominence the potentialities of wireless telegraphy. Experiments arranged beforehand, experiments where every man is at his post, are undoubtedly interesting, but they are experiments and nothing more. They are not demonstrations.




*The East Goodwin Lightship of 1899, as depicted in a contemporary engraving*

*Photograph by kind permission of GEC – Marconi Ltd*


*A more modern lightship*

*Photograph by kind permission of Nicholas Horne Ltd*


*The present-day East Goodwin Lightship, now unmanned and automatically controlled*

*Photograph by kind permission of Trinity House*

The occurrence at the Eastern extremity of the Goodwin Sands amounts to a demonstration of the practical value of wireless telegraphy within certain limits. In a dense fog a steamer proceeding down Channel shaved too closely the well known danger, and ran into the Lightship which marks one extremity of the peril. A Lightship is not moored with absolute rigidity. She is, of course, not under way, and there is a certain play on her cables which allows of a very modified extent of alteration of position by means of this rudder. Fortunately, the approach of the stranger appears to have been observed in time. The helm was put down, and the tide, of course, swung the ship. Even then she was struck heavily, and sustained a considerable amount of damage. It was the old story of insufficient allowance being made for the tide. This has probably sunk more ships than any other mistake, and it is likely to sink a great many more before officers commanding vessels learn that a mile or two of additional course is cheaply purchased as the cost of giving danger a wide berth. In this case it fortunately happened that the stricken lightship was in communication by means of wireless telegraphy with the South Foreland Lighthouse. The distance is about twelve miles, and a message was sent without delay. Particulars of the collision were forwarded and the necessary assistance was arranged for. By this power of communicating the East Goodwin Lightship was placed in immediate communication with the telegraphy system of the country. Ramsgate and other ports contributed their help, and by this time a new Lightship has probably taken up the moorings of the one that was damaged. It is satisfactory to find that the new system has thus proved its possibilities, but it will be wise not to expect too much from it for the present. Even those who are best acquainted with it recognise its limits, in the immediate future at any rate. That it can be usefully employed over short distances has now been practically demonstrated. Its potentialities are infinite, but in regard to long distances it still remains to translate these potentialities into definite facts. Like everything else, wireless telegraphy must have a beginning, and accident has rather helped it in making a sensation in its early stages.'

## Literary Licence?

The Press reports however appear to have been rather exaggerated as *Lloyds List* found it necessary to publish the following statement on May 1:

**'THE COLLISION WITH A LIGHTSHIP.**

In consequence of the publicity given in the Press to the collision which occurred on Friday morning between the East Goodwin light-vessel and the steamship *R. F. Mathews* we are requested by the Trinity House to state that, from reports received from their district superintendent at Ramsgate, the damage sustained by the light-vessel is found to be but slight, that in no way affects her seaworthiness, and that the necessary repairs can be effected without bringing the vessel in from her station.'

It can be seen that this incident together with the transatlantic tests of 1901/2 led to the rapid acceptance of radio over the next few years. By 1915 there were already 706 Coast Radio Stations (world-wide) and 4866 ships carrying radio. 'Spark transmission' was not banned by international agreement until 1941.

The reference to the telephone and telegraph system may surprise readers, but already the telephone was taking over from the telegraph and as early as 1887 there were already 26 000 telephone subscribers in the United Kingdom. However, at the time of the East Goodwin incident the majority of official traffic was still carried over telegraph land-lines.

*This modern view of the South Foreland Lighthouse shows little change from its appearance at the time of the incident*

*Photograph by kind permission of The National Trust*

The equipment used was very simple and the circuit diagrams give an indication of the type of transmitter and receiver that would have been used both on board the vessel and at the lighthouse. Note that they were all 'solid state'! The basic element of the receiver was the coherer; this was a tube with a copper electrode at one end and a carbon electrode at the other, the gap between being filled with iron filings. Under the influence of RF energy the resistance of the filings decreased, so allowing the bell or Morse printer to operate. By the late 1890s, relays and Morse printers were quite well developed.

As far as the *R. F. Mathews* was concerned, her future career was none too glamorous. In 1902 she was sold to C. Allodi in Italy, and renamed *Meloria*. In 1912 she was again sold, this time to the Turkish government, and renamed *Derna*. Under this name she continued to appear in *Lloyds Register* until the early 1920s. Enquiries have eventually revealed that she had been torpedoed and sunk, probably by the Russian fleet during the First World War. The location is thought to be off Kozlov, near Bender Eregli on the Turkish Black Sea coast. A sad ending for a vessel which, by default, caused the development of radio at sea to be taken seriously in its early days.

Of the people involved, further research is being undertaken. However, the Mr Bullock who is mentioned in the *Morning Post* report and other Press statements as the 'Assistant to Signor Marconi' will appear again in a further article. He was a very active employee of the Marconi company and was much involved with the establishment of the early Coast Radio Stations.

## Acknowledgments

The author would like to thank GEC – Marconi Ltd., Guildhall Library, Lloyds of London, National Maritime Museum and Trinity House for their assistance during the preparation of this article.

**RB**

# A Radio Bygones Collection in North Yorkshire

*by G. Baker*

Since taking early retirement from the 'Trade' and moving North to a little village near Richmond from an equally small village near Ipswich in Suffolk, I seem to have become a magnet to all the old radios in the area. These have been on offer at car boot sales and second-hand shops, and so on.

It started in a small way of course! I saw a Bush DAC10 on offer for a couple of pounds and couldn't resist it. It was a reminder of the days, I suppose, when I used to sell them new for about £18 and wished I could afford one myself. As a newly married shop manager I had to rely on second-hand sets and they were gradually improved upon when a good 'trade-in' presented itself. How I longed for a nice German Continental Grundig with VHF, retailing at £49 19s. 0d. – a lot of money for a radio thirty-five years ago. Now I guess I must have half a dozen!

Radios kept on turning up and finally overcame my small workshop leaving me nowhere to work. One day my wife said, 'Why don't you do the job properly and get a large shed in the garden to display those radios?'

I didn't need a second bidding and now, four years on, there must be over 150 sets reposing on shelves, all serviced, cleaned and waiting to play for someone.

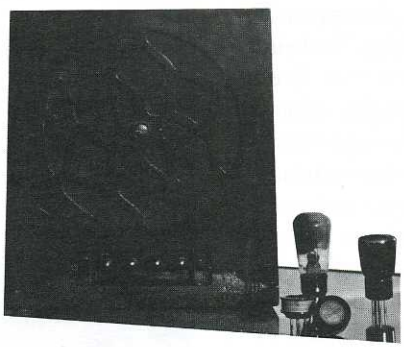
Most of my collection is from the early fifties but I have a handful of pre-war machines, the earliest of which is the Columbia (**Fig. 1**) a two-valve mains receiver, circa 1932, using a PM24 and MHL4 and incorporating a moving iron loudspeaker. The tuning coils (seen in front of the valves) are plugged into sockets similar to four-pin valve holders and so can be changed at will.

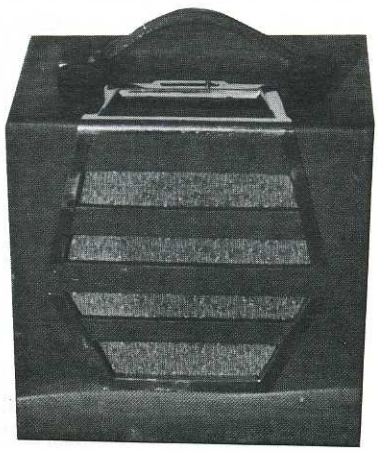
Another pre-war model, circa 1936, is the Beethoven 'Little Prodigy' (**Fig. 2**), an all-dry battery set using 1.5V side-contact valves, DK1, DF1, DAC1, DL2 – quite rare even in their day, I should imagine. These were later replaced by an octal version of the same types.

Then we have the Cossor P44 (**Fig. 3**). Would this have been made just before or just after the Second World War? It was discovered by a friend when clearing an attic after the death of a relative and is in pristine condition, having been stored away in its original carton. As can be seen from the photograph, it retailed at £6 19s. 0d. **including** the expensive batteries: The small print below is a dire warning against selling the set at anything below the specified list price. They were 'very hot' on price maintenance in those days. A dealer could be 'struck off' and lose his treasured maker's agency for any offence in this direction.

**Figure 4** shows a classic Murphy Model A262 in a handsome wooden case and one of the first of the Murphy range to carry the VHF waveband.

The DAC10 (**Fig. 5**) was a fine Bush model, a stable-mate to the famous DAC90A. It featured long and medium wave tuning with three preset stations and



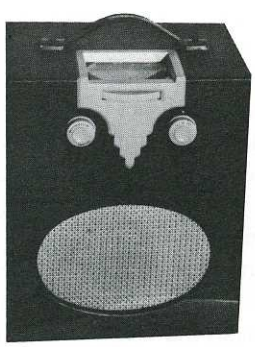


1 2

3

4 5

*Key to photographs*




was considered an excellent set in its day. It had a built-in aerial and would work on AC or DC mains supply. The model shown is absolutely original, no repairs or replacements have ever been made, not even a dial bulb – a credit to its maker. The only thing to be removed from it was the dust of some thirty-plus years!

Another classic Bush (**Fig. 6**) was the VHF6l, with magic eye tuning and VHF. It was the Bush answer to the increasing flood of imported radios from the continent, such as Grundig, Nordmende, Braun, etc., and was in fact known as the Bush 'Continental'.

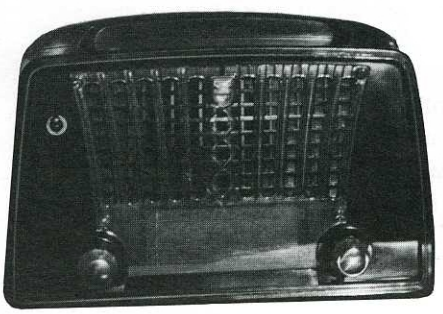
**Figure 7** shows a pretty little pair of bakelite Philips radios, both AC/DC. The one on the left is a model 1410. (No, I did **not** fit the toggle switch!) The other is a Philetta 283/71.

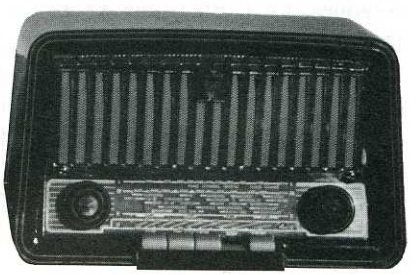
The neat little Murphy U502 in **Fig. 8** was available in a red or black plastic cabinet and receives VHF only. It gives good results on a short throw-out aerial.

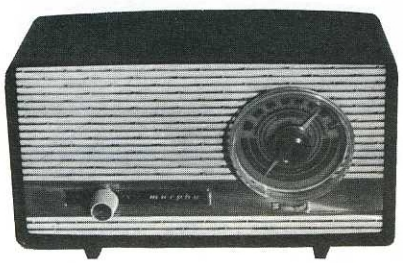
The Philco Model 100 table model shown in **Fig. 9** is in a wooden cabinet and somewhat gaudy in appearance for its age (1953).

**Figure 10** displays a very nice Stella Model ST2390 in a bakelite cabinet. It was made by Philips, of course, but as it carried the Stella trade name it could be sold through a wholesaler to any radio dealer whereas a Philips set would only be supplied to a registered Philips dealer.

The Murphy AD94 receiver (**Fig. 11**) is of particular interest as it is featured on the front cover of the book, *The Cat's Whisker; 50 Years of Wireless Design*, by Jonathan Hill – a most interesting book. The set was made in 1940 and is housed in a black bakelite case for use on AC/DC mains, covering short and medium waves. When I purchased it I found it to be 'dead' and the rectifier valve (a Mazda octal) proved to be O/C. Not having a replacement the problem was solved with a flash of inspiration! I made up a little sub-assembly mounted on the base of the O/C valve and used two UY85 valves in parallel. This gave me the correct voltage and amperage for the heater chain so the set was soon working again.





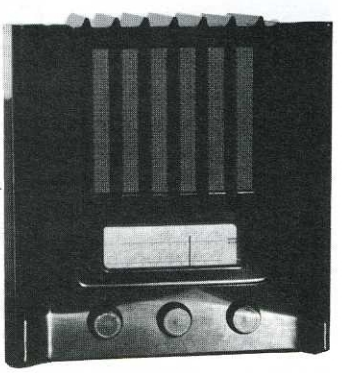


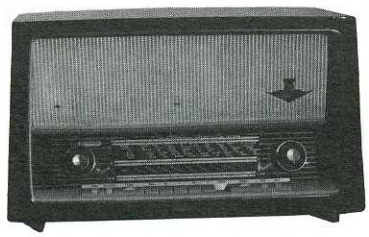
6 7

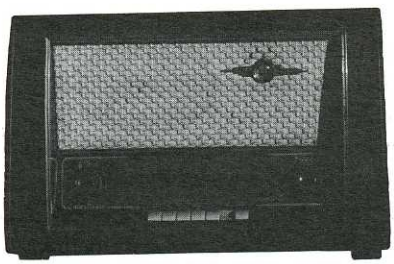
8 10

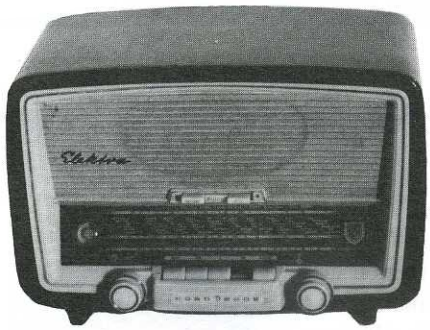
9 11

*Key to photographs*









12 14
13

*Key to photographs*

My last three illustrations (**Figs. 12, 13 and 14**) show a collection of German receivers made by Nordmende. I bought them at a large flea-market in Korbach, Germany, whilst on holiday and they give a little continental flavour to the scene. Fig. 12 is a 'Rigoletto' table model, Fig. 13 a handsome luxury table model, type 'Carmen 55' with magic eye, and last but not least an 'Electra 59' with magic eye and various extra tone push-button controls above the dial.

This gives a little insight to my collection but the shed is now full: What now?

***RB***

**COMPETITION**

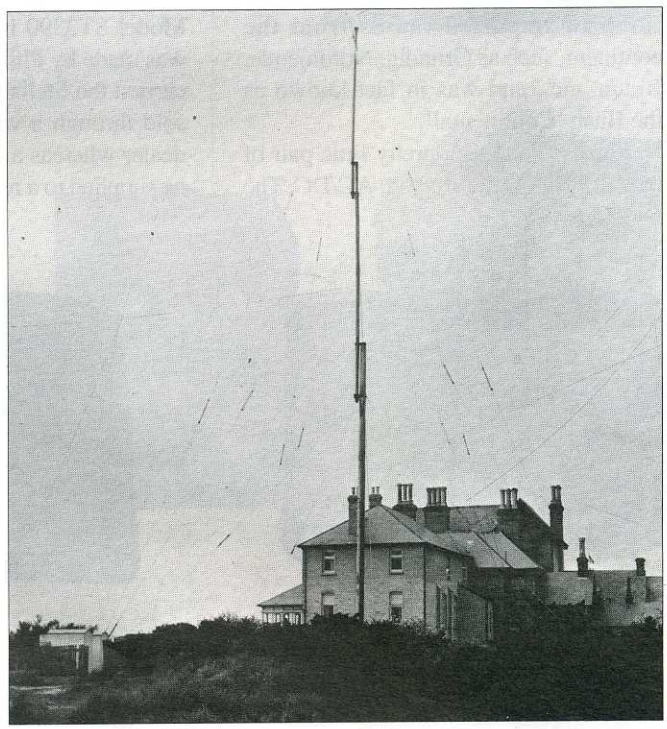
# Where is it? - No. 5

Another puzzle for you to solve, but this one should prove easier, as it's a photograph which has been published many times before. So easy, in fact, that you're not getting a clue this time!

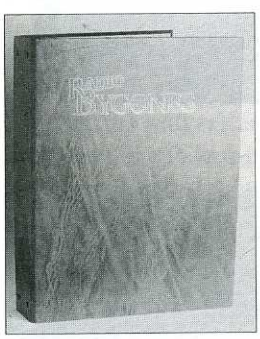
If you can supply the answers to the questions, where is it and roughly when was the photo taken, write them on a postcard or the back of a sealed-down envelope, and post it to Radio Bygones, 8A Corfe View Road, Corfe Mullen, Wimborne, Dorset BH21 3LZ, England.

The first correct answer drawn out of the Editor's hat (he's had to give up biscuits following his heart attack, so there's no editorial biscuit tin any more!) on Friday, January 11 will win for its sender the prize of a year's subscription to *Radio Bygones*! The answer, and the name of the winner, will appear in our next issue, due out on January 29.

**Don't forget, the closing date for receipt of your entries is Friday, 11 January 1991.**
**The Editor's decision is final.**



*Photograph by kind permission of GEC – Marconi Ltd.*



# NOW IN STOCK!

## Binders for Radio Bygones

### Keep your favourite vintage radio magazine safe and tidy

*Each binder holds twelve issues, safely retained by strong wires. Price £6.00 each to UK addresses (inc. VAT); £6.75 overseas by surface mail*

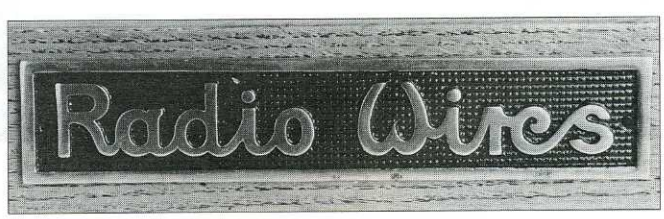
Send your order to Radio Bygones, 8A Corfe View Road, Corfe Mullen, Wimborne, Dorset BH21 3LZ, England.

*(See page 8 for details of how to pay)*

**NEWS EXTRA**

# Can You Help?

Bill Journeaux has recently come by an old cast steel sign, measuring about 11½ x 2¼ inches, which is pictured below. There's been something about the origin of these signs somewhere in a vintage radio publication very recently, but we can't seem to lay hands on the reference. Any information, please, to the Editor.

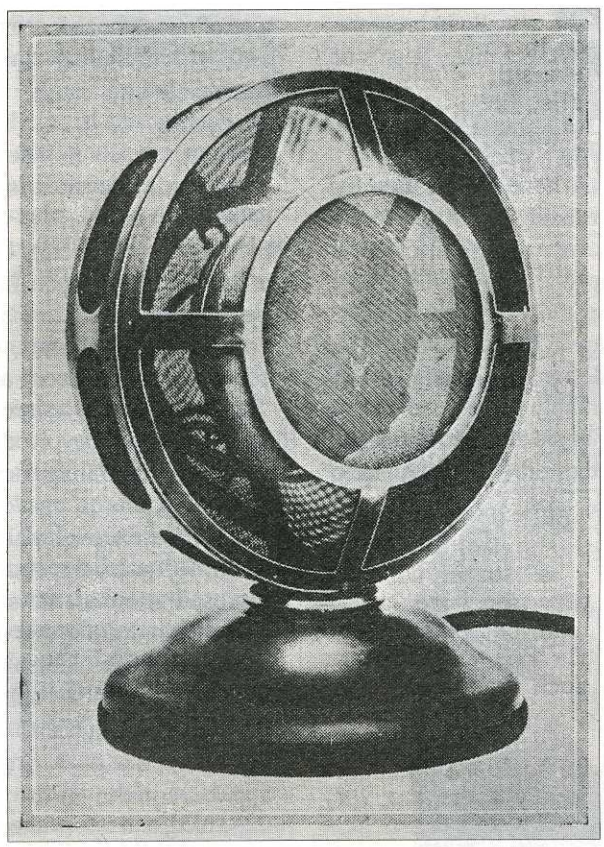


# Alan Douglas Remembers... 1920 – 1926

I was now committed to valve apparatus, and thanks to my war experience, I knew a lot about them. We lived in a large house of three storeys, so it was possible to have an aerial some 40ft long and nearly 60ft high. Alas, the earth connection was nearly as long! But I did a lot of furious experimenting, which led to my writing my first book, *The Construction of Amateur Valve Stations*, in 1921. This was published by The Wireless Press of Henrietta Street, London WC2 (also at that time publishers of *The Wireless World*), price 1s. 6d. (7½p), with over 120 000 copies sold. There is a copy in the RSGB library. Not long after that I wrote another book on crystal receivers, published by Radio Press which I then joined as associate editor.

Programmes received from PCGG had enabled me to perfect LF amplification as far as was possible with the crude loudspeakers available, so I was ready for 2MT and 2LO. I have a letter from P. P. Eckersley offering me a job as an engineer, but I turned to design and brought out the first entirely self-contained portable set in time for the 1924 Wembley Exhibition. Marketed by the City Accumulator Co., our first customer was Dame Clara Butt; the second was Ivor Novello.

I took Dame Clara's set to her house at Goring-on-Thames, and at 40 miles reception was excellent. Not bad for a little frame aerial measuring 18 x 12 inches, but the circuit was very advanced, with double reaction, reflexing, etc.



*The Western Electric double-button microphone*

## From the Stage

The BBC was exploring ways of relaying outside material, and one of their first experiments was broadcasting from the stage of Covent Garden. I wrote about it at the time in *Wireless Weekly*. (Reproduced in the following two pages – Ed.)

Those who know my name at all probably associate it with my many books on musical instruments. I have always been interested in music and a practising organist since 1920. Naturally I met many musicians and one in particular was Herbert Carruthers, then director of the Glasgow BBC station. Incidentally I gave two technical broadcasts there in 1923 and 1924. The studio equipment was all Western Electric, about which more later, and the transmitter was a Marconi 1.5kW set. Carruthers was asked to broadcast an organ recital from Westminster Cathedral (he had been organist of Park Parish Church, Glasgow) but felt that he needed some moral support. So he asked me to come along, and it was a good thing that he did. The Western Electric double-button carbon microphone was slung across the cathedral on two wires, which promptly picked up 2LO at good strength! Substituting stout cords solved this problem. The BBC had no OB (outside broadcast) amplifiers at that time, so a naval 'fish' amplifier, used for submarine detection was brought into use. A good thing that frequency response was not even thought of in those days! Well, we went to the gallery organ console, with its imposing array of stops, but when Carruthers tried to pull some of them out, they would not move. The organ was only partly built and some stops were nailed down – no guidance given! Poor HC did find out which worked but had to down a few stiff whiskies before he had the courage to play – brilliantly I am glad to say.

About this time, the Rice and Kellogg moving coil cone loudspeaker patents revolutionised audio performance. I recall the excellent receiver in the Science Museum, with its two LS5 valves feeding a paper cone 'speaker on a large baffle. It has been suggested that either Norman MacLachlan or H. J. Round actually made such a loudspeaker before Rice and Kellogg thought of it, but discarded it as just a toy. In any event, that made the BBC pull its socks up and extend both frequency response and depth of modulation.

Early in 1925 there was a radio exhibition in Nottingham, and I was invited to give a talk on the local radio station 5NG. Nothing very exciting about this, except that when a brass band attempted to play, the volume could not be kept down and all the players had to face the heavy drapes on the walls and play with their backs to the Sykes-Round microphone.

## Disc Recording Equipment

This was a time of great activity in the gramophone recording world. Though not strictly radio, programmes were sometimes recorded, on disc of course, so some mention of the great contribution by Maxfield and Harrison would not be out of place. The transition from acoustic to electric recording was just taking place, and record cutter designers were plagued by >>22

*The following article, written by Alan Douglas, was published in the April 18, 1923 issue of* Wireless Weekly *magazine.*

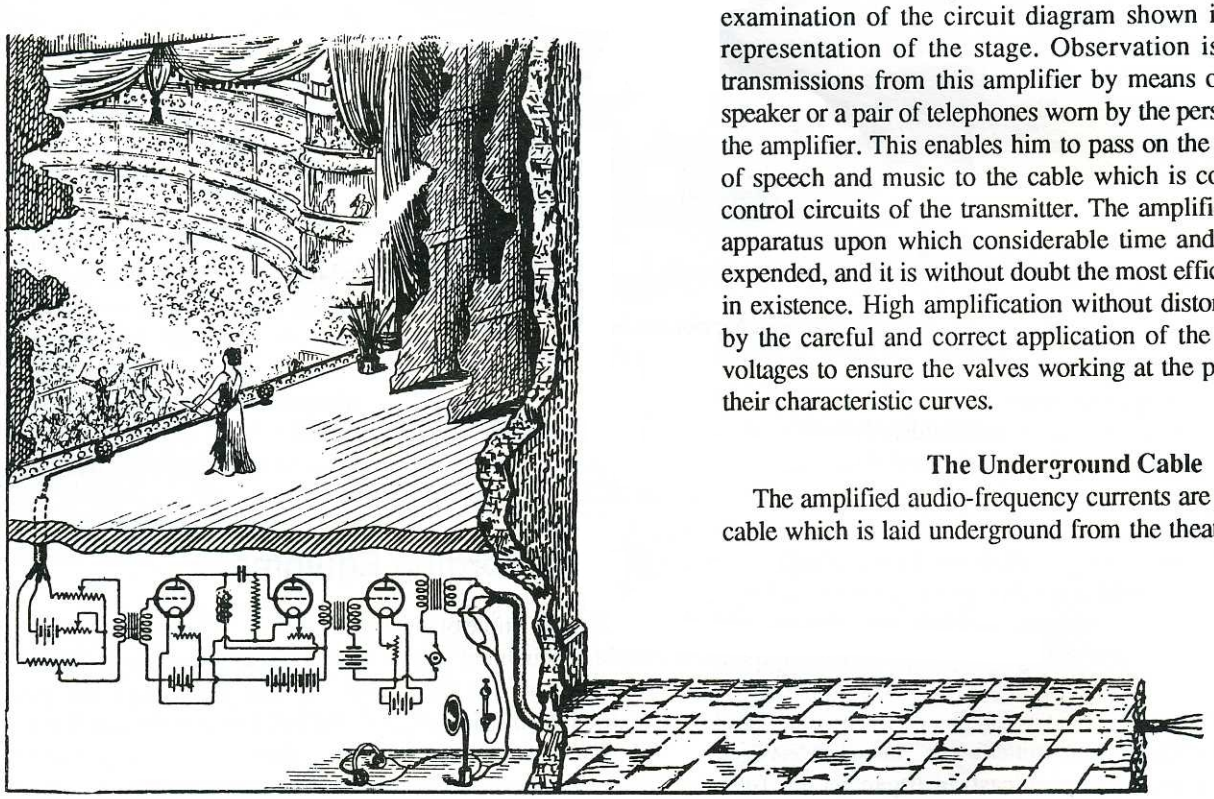
# BROADCASTING FROM THE STAGE

*An article describing the actual apparatus used for this purpose*

WE give below the first practical description which has been published of how the broadcasting of grand opera, musical comedies, etc., is carried out directly from the stages of theatres and whilst the plays are actually in progress. The description must necessarily be brief, but many details of considerable interest will be found in this article.

### The Microphones

It will readily be appreciated that the microphones used for this class of transmission must be exceedingly sensitive to the smallest sound and yet comparatively insensitive to mechanical vibration. The ordinary type of microphone does not fulfil these conditions, particularly as regards sensitivity to distant sounds. The special type of microphone employed has been evolved by one of the firms responsible for the design of a certain type of broadcasting transmitter, and is remarkably sensitive to distant sounds. One or two of these microphones are mounted in suitable positions behind the footlights. Here they are so disposed as to ensure a balance of tone between singers and performers on the stage, with their relatively weak voices, and the music of the orchestra, which has considerably more volume. This particular type of microphone is sensitive to sound impinging upon it from both sides, and is eminently adapted for this class of transmission.



### The Speech Amplifier

Whilst, however, it is exceedingly sensitive to sound, the current output from it is very small and, in consequence, must be amplified electrically before it will be of sufficient intensity to impress speech upon the control circuits of the transmitter. A glance at the figure in the left corner of the page will explain how the microphones, placed behind the footlights, are connected to the speech amplifier, which is beneath the stage. The same firm who are responsible for the design of the microphone have evolved this type of speech amplifier. It is, of course, an audio-frequency amplifier, and employs three stages of magnification.

There are novel points which will be appreciated on examination of the circuit diagram shown in the pictorial representation of the stage. Observation is made on the transmissions from this amplifier by means of either a loud speaker or a pair of telephones worn by the person in charge of the amplifier. This enables him to pass on the correct volume of speech and music to the cable which is connected to the control circuits of the transmitter. The amplifier is a piece of apparatus upon which considerable time and care has been expended, and it is without doubt the most efficient of its class in existence. High amplification without distortion is ensured by the careful and correct application of the necessary grid voltages to ensure the valves working at the proper points on their characteristic curves.

### The Underground Cable

The amplified audio-frequency currents are transferred to a cable which is laid underground from the theatre to the actual

transmitter. Here observation is again made on the incoming audio-frequency current, in order that the operator at the broadcasting station may regulate the current supplied to the modulating apparatus.

### The Modulation System

The modulating system includes an iron-core high ratio transformer, which is connected across a small valve having an output of about 50 watts. In order, however, that this may produce a greater potential variation across the control circuit of the transmitter, the output from this tube is further amplified by means of a second valve having a power output of about 150 watts. The variations in plate potential of this valve are now of sufficient intensity to affect the high tension supply of the main transmitting valve when applied across the end of an iron-core choke of high inductance value, wound upon an open iron-core.

### The Oscillatory System

This is inductively coupled to an oscillatory circuit consisting of a tube dissipating slightly over 1½ kilowatts of high frequency energy. This arrangement, as a matter of fact, is really duplicated, so that two oscillatory circuits are supplying the power to a coupled circuit to which the aerial and capacity earth systems are connected. The valves throughout the transmitter are lighted from accumulator batteries. The valves of the speech amplifier at the stage are, of course, lighted from accumulators there. The use of AC to light these filaments causes an undesirable hum in the speech, and for this reason it is only of use for lighting the filaments of the rectifying valve, where it will be in phase with the rectification taking place.

### The Power Supply

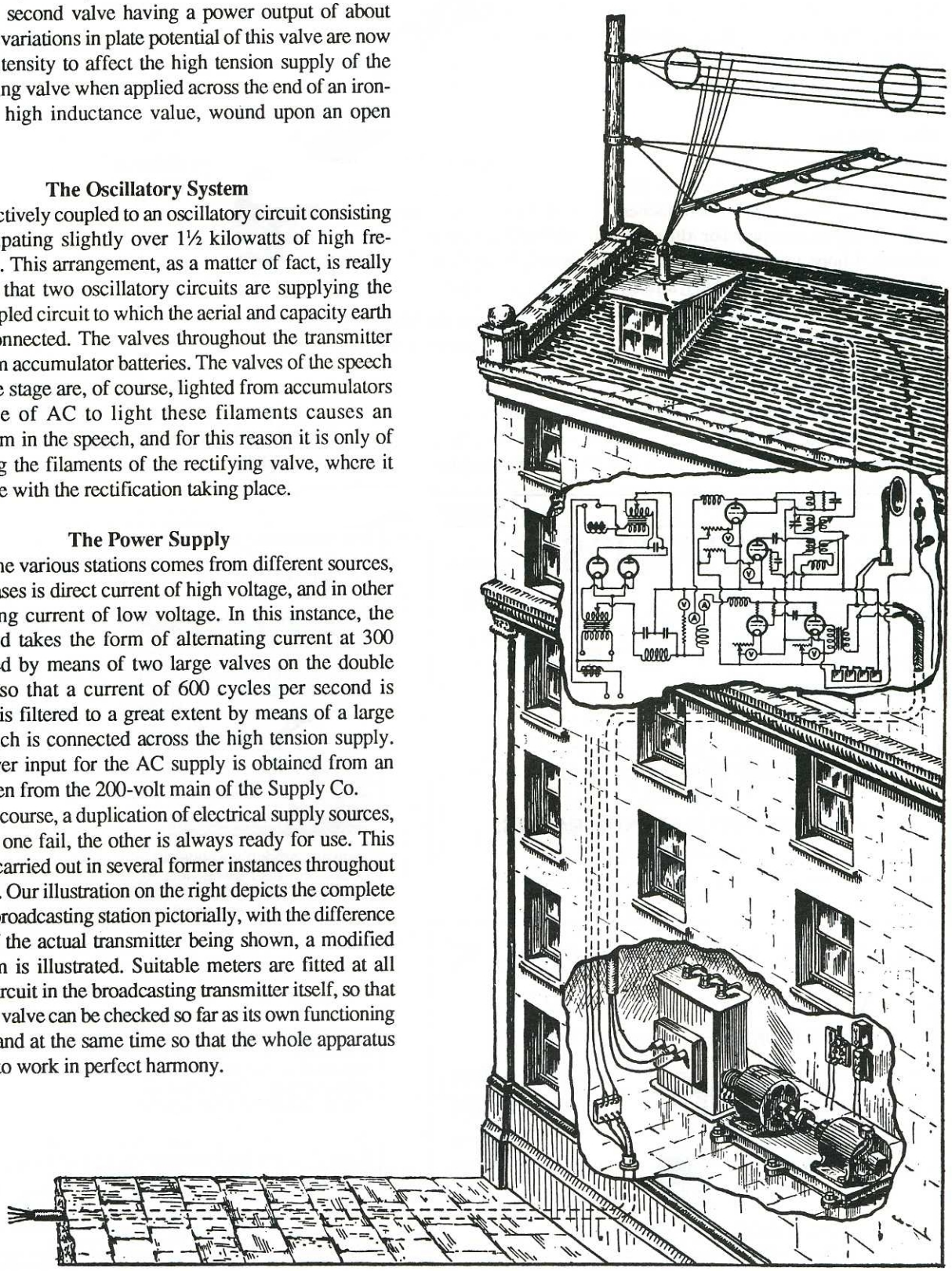
Power for the various stations comes from different sources, and in some cases is direct current of high voltage, and in other cases alternating current of low voltage. In this instance, the power supplied takes the form of alternating current at 300 cycles, rectified by means of two large valves on the double wave system so that a current of 600 cycles per second is obtained; this is filtered to a great extent by means of a large condenser which is connected across the high tension supply. The main power input for the AC supply is obtained from an alternator driven from the 200-volt main of the Supply Co.

There is, of course, a duplication of electrical supply sources, so that should one fail, the other is always ready for use. This duplication is carried out in several former instances throughout the transmitter. Our illustration on the right depicts the complete lay-out of the broadcasting station pictorially, with the difference that instead of the actual transmitter being shown, a modified circuit diagram is illustrated. Suitable meters are fitted at all points of the circuit in the broadcasting transmitter itself, so that each particular valve can be checked so far as its own functioning is concerned, and at the same time so that the whole apparatus may be made to work in perfect harmony.

### The Aerial System

The type of aerial used is one which has a very low radiation resistance for short wavelengths, which is of course essential if the greater portion of the power supplied to the aerial is to be radiated. This brief description will give the reader an insight into the technicalities underlying the transmission of performances from the stages of theatres. We hope it will not be long before a regular programme of this type of transmission is in force.

A. L. M. D.

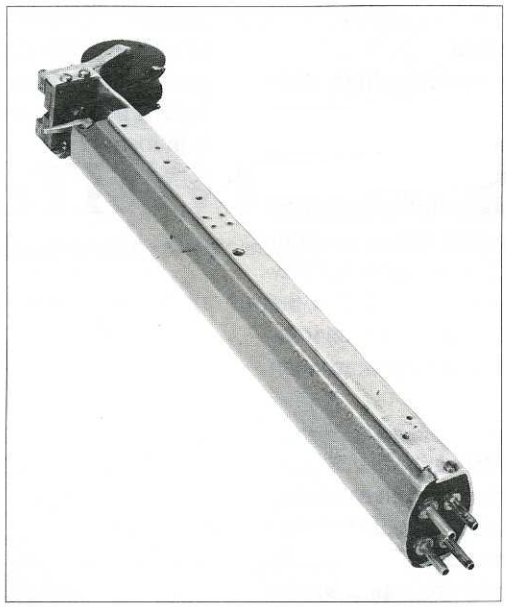


**19>>** resonances and peaks in the suspension or damping. Maxwell and Harrison solved this by using a long transmission line as a torsional damper on the pivotal plane, so it was always linear. The resulting instrument was long, but light and easy to balance.

This recorder became the standard for many years; HMV, Columbia, Parlophone and others all used it until the exciting moving coil instrument of Alan Blumlein came along. I actually made one; it is in the Science Museum (see photo) and I had the pleasure of using it for a private recording of the late Duke of Windsor, then Prince of Wales, made at the Curwen studios. Well informed, as ever, he looked at the wax afterwards and said to me, 'they turn these things into steel don't they'.

Sound film recording had not yet come along, but excellent microphones were being developed for the disc industry. I hope to give some space to all the early designs in a later article. Suffice it to say now that the invention of the stretched diaphragm condenser microphone by Wente in 1920, later improved by Thuras, provided a sensitive instrument with a silent background for the first time.

Radio circuits were now very satisfactory and the only thing missing was mains operation. At this time many public supplies were DC, leading to some hair-raising experiments! I recall myself that the Glasgow system generated at 500 volts for the tramways, then split the circuit into two sides each of 250 volts for domestic use. There was thus a common centre tap, as it were, but alas, they had a horrible habit of occasionally switching from one side to the other, thus reversing polarity, which had to be checked every time one wanted to charge accumulators. I used a potato cut in half; if the supply wires (through a lamp, of course) were touched on the damp surface of the potato, the negative blackened and bubbled. Cheap but effective!



*The replica of the Maxfield and Harrison wax recorder built by the author*

Charging current was regulated by inserting lamps of various wattages in series with the accumulators. Carbon filament lamps passed almost exactly 1 ampere, and more could be got from the long tubular lamps used as electric radiators. I did not see an alternating current mains unit for radio until 1926, but of course valves were also progressing and the indirectly heated cathode was an immense step forward. The Americans were years ahead of us in this technique, the valves used in the Birmingham transmitter were long tubes with coated ribbon filaments which could hardly be seen in daylight. ***RB***

# Servicing the Equipment of Bygone Days

## No. 2 – The Cossor Model 499

*by John Earl*

I think that the 499 was the second so-called 'all dry' portable from the Cossor stable after World War II. An earlier model was the 469, which was released in September 1947 and proved itself to be quite a novelty in those days. The Model 499 was launched at the end of 1949, price £12 19s. 6d. plus Purchase Tax. Its circuit had a good deal in common with the earlier 469.

The domestic advent of the low consumption miniature 1.4V valves made possible this early post war type of portable. Portables before the war relied upon the lead acid accumulator for filament power, and were hence quite massive devices with the addition of their 120V HT battery! The term 'all dry' was coined because the 1.4V valves allowed the filament power to be provided by a 1.5V dry cell or battery.

My first encounter with the 1.4V valves was when I was working with the Royal Corps of Signals out in the Far East during the war. They were used in an American-designed hand-held transceiver, and worked remarkably well in both transmit and receive modes. I think the valves are still obtainable from specialist sources, so perhaps it would be fun to design a QRP (low power) amateur band transmitter around then one day.

Anyway, as will be seen from the full circuit (**Fig. 2.1**), four such valves are employed in the 499. All have B7G bases. The 1R5 (equivalents DK91, X17 and 1C1) is a hexode frequency-changer. The 1T4 (equivalents DF91, W17 and 1F3) is a pentode IF amplifier. The 1S5 (equivalents DAF91, ZD17 and 1FD9) is a diode-pentode. The 3S4 (equivalents DL92, N17 and 1P10) is an output pentode. All valves work from a 1.5V filament supply and 90V HT supply. The first three valves have a filament current of 50mA each, while the output pentode will be seen to have a centre-tapped filament. When the two halves are effectively connected in parallel (as shown in the circuit), the current consumption is 100mA (e.g. two times 50mA). However, this valve could also be operated with the two halves of the filament in series, the current then being 50mA, but requiring 2.8V instead of the usual 1.4V. In most 'all dry' portables the filament halves are in parallel, as in the 499 circuit.

Total filament consumption, therefore, is 250mA, or a quarter of an amp, at 1.4V, which works out to 350mW – quite a fair power from a 1.5V dry battery or cell! Actually, one of the biggest bugs of the receivers was the LT battery voltage falling below the level necessary to maintain local oscillation of the frequency changer.

## Set 'Live' but No Signals

This symptom is a fairly sure indication that the 1R5 is failing to oscillate. The electrodes involved with the local oscillator section are grids 1 and 2 **plus** 4. The signal, or input, grid is grid 3, whilst grid 5 is the suppressor grid. As previously mentioned, a low LT battery should first be suspected. When the voltage drops much below 1.3V oscillation can become unpredictable; but a point to remember is that as the emission of the 1R5 falls (with age) so the oscillator will drop out at a less lowvoltage. In fact, under this condition

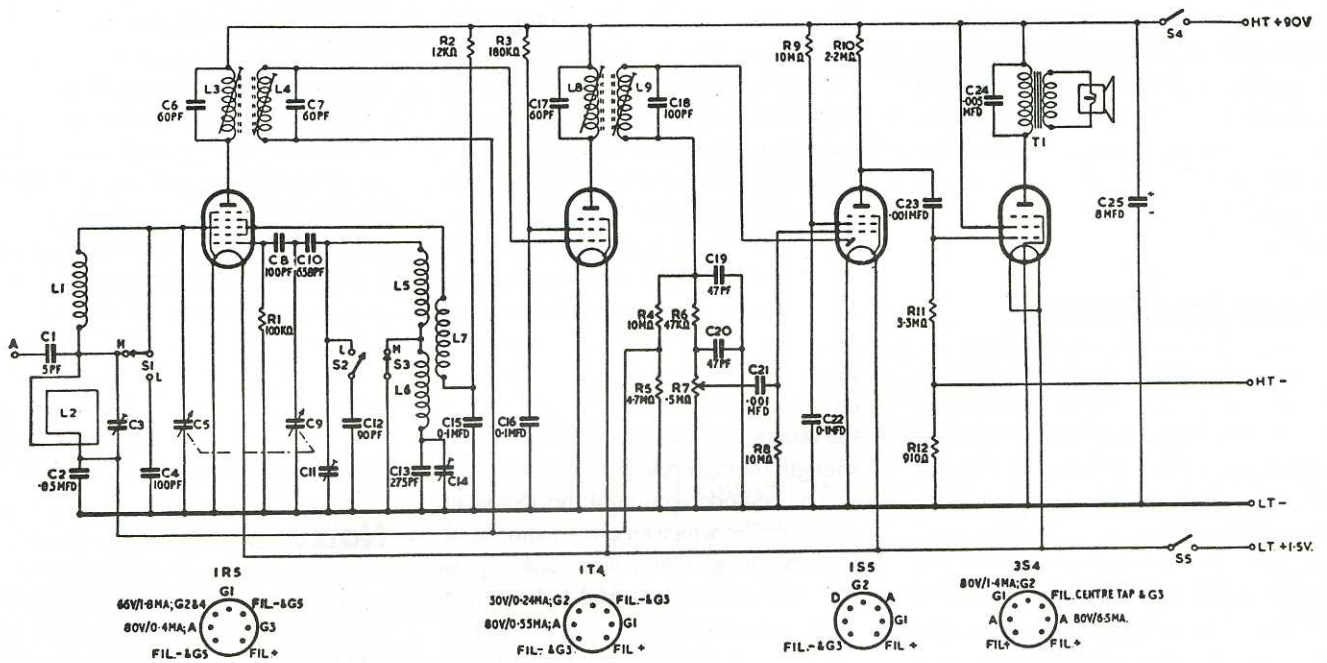



*Fig. 2.1 - Cossor Model 499 circuit diagram with valve pinouts and voltage/current details*

*Reproduced from* Radio and Television Servicing, *by kind permission*

oscillation may only be sustained with a virtually brand new LT battery. The 1R5 will also cease to work properly if its filament has been over-run: for example if a voltage greater than 1.5V has previously been employed for LT. Funnily, the other valves are less affected by this over-running.

You can easily tell whether the rest of the receiver is active firstly by scratching the blade of a screwdriver, which is in contact with the hand, against the middle contact of the volume control R7 (i.e., the tag which connects to C21). If this produces fairly strong crackling in the loudspeaker, then you can be pretty certain that both the 1S5 and 3S4 stages are working. Secondly, with the volume control fully advanced, slight crackling or even a faint radio signal should be heard when the blade of the screwdriver is scratched against the control grid – grid 1 on pin 6. If the set appears to be fairly lively in these respects, yet fails to tune a signal then, providing the alignment has not been tampered with, it is almost certain that the local oscillator is defunct.

The oscillator coils are L5 and L6, with L7 as the feedback winding. L5 and L6 in series tune the LW band. When switch S3 is in the MW position, L6 is short-circuited, and L5 tunes the MW band. Other critical components in the oscillator section are R2 and C15. If the resistor goes high in value or the capacitor becomes 'leaky' or open-circuit, then there will be no oscillation. Capacitors C8 and C10 will also affect the working of the oscillator; but I have not known these capacitors to be responsible for the symptom. However, if a sample of the receiver has been discovered in a damp attic, for instance, lack of working might well be caused by the effects of damp on these components or, indeed, on the oscillator coils themselves.

## Basic Realignment

If there is reason to suspect that the IF, RF or oscillator trimmers or inductors have been maladjusted, then lack of tuned signals may be due to this cause. General alignment of this receiver is very straightforward and, as with all superhet receivers, the IF transformers L3/L4 and L8/L9 should be adjusted first. The IF is 470kHz. You really need a signal generator for this, tuned to the IF and applied via a 0.01µF capacitor to grid 3 (pin 6) of the 1R5. With the signal modulated, maximum output from the loudspeaker should be achieved by adjusting L9/L8 and L4/L3 in that order, readjusting until no further improvement is obtained. The generator output should be set to the lowest possible level to avoid the effects of the AVC.

In the days of this sort of portable, the RF stages were adjusted by injecting a signal via a special kind of 'standard' shielded coil. However, from the basic point of view, the generator signal can be loosely coupled to the frame aerial L2 from a short length of wire (acting as a transmitting aerial) connected to the generator's output terminal. The MW band at a scale setting of 206.5m is first adjusted by tuning the generator to 1450kHz (modulated) and adjusting oscillator trimmer C11 until the signal is heard from the speaker. Make certain that the set is accurately tuned to this signal, reduce the generator output and finally adjust the MW aerial trimmer C3 for maximum output. All that is required for the LW is an adjustment of the LW padder C14 in the oscillator for maximum response when the set is tuned to 1875m and the generator to 160kHz. Finally, repeat the MW and LW adjustments for maximum improvement, with the generator turned well down.

## The 1S5 Stage

The IF signal from the top of L9 is applied to the 1S5 diode, which acts both for detection and AVC. The diode load consists essentially of the volume control R7 in series with R6. Decoupling at IF is performed by capacitors C19 and C20. The DC voltage at the top of R6 with respect to the negative LT line is connected to resistive divider R4 and R5. This voltage is relatively negative and goes more negative with increasing signal strength. It is applied to grid 3 of the 1R5 by way of L2 and L1 and to grid 1 of the 1T4 through L4, and as these valves have variable-mu characteristics the gain of these two stages is reduced on strong signals, thereby tending to keep the output constant regardless of signal strength (normal AVC).

The pentode section of the 1S5 is an AF amplifier, which receives audio signal from the slider of the volume control, via C21, at its control grid, grid 1. Amplified audio is developed across the anode load resistor R10, and thence coupled to the control grid (grid 1) of the 3S4 output pentode through C23. Because the full HT supply current flows through the 910Ω resistor R12, the top of this resistor becomes negative with respect to the negative LT line. It is this negative voltage which is used to bias the 3S4 by way of the 3.3MΩ resistor R11. It must be remembered that the bias for directly-heated (filament) valves of this kind applies between the filament and the grid, the filament thus acting as a 'cathode'.

## Motor-boating or LF Instability

A common fault, as I recall, was a low-frequency 'growling' or motor-boating noise. This was sometimes caused by almost complete exhaustion of the HT battery, the source impedance of the battery increasing. On the other hand, an open-circuit or low value electrolytic capacitor C25 was often responsible. If this capacitor were open-circuit, then the symptom may not manifest with a new HT battery, but would show up as soon as the battery started to age a little – indeed, before it was at the conclusion of its useful life – a point to remember!

## Inadequate Volume

In good 'nick' these little portables were capable of very satisfactory audio performance. I recall using one for our main radio 'entertainment' just after my wife and I were married. Distortion will almost certainly occur if an insulation leak develops in the audio coupling capacitor C23. Also the volume would be low and the HT battery would run down fairly quickly owing to the abnormally high current drawn by the 3S4.

Of course, impaired alignment would be another cause of inadequate volume, so also would low emission of the 1S5 or 3S4. If the screen grid voltage of the 1S5 falls due to R9 increasing in value (and with that 10MΩ resistor such a fault was not uncommon) or the decoupler C22 becoming 'leaky', the full audio potential of the receiver would be impaired. For the symptom a resistance check of R10, the anode load of the 1S5, should also be made.

## Noisy Controls

If you come across such a receiver which has been hidden away for forty-odd years, you will almost certainly find that both the tuning control and volume control crackle when turned. This can

invariably be cleared merely by instilling a few drops of Electrolube No. 2 down the spindle of the volume control and at the bearings of the tuning capacitor, working the controls for a few minutes before switching on.

Generally, should you come across an old receiver which has been out of service for many years, it is always prudent to change all electrolytic capacitors, while the leakage insulation of any early types of 'paper' capacitors should also be checked, especially audio coupling capacitors.

I have never encountered a faulty speaker transformer T1, but if the audio stages are completely 'dead', then a check of the primary winding would not be amiss. This should have a resistance of 450Ω. Capacitor C24 merely serves to attenuate the higher-order harmonic content from the output signal, while also helping to 'stabilise' the output stage, reducing the treble response. A short here would be detected by the transformer resistance check. With the heater halves in parallel and the valve running at 1.4V LT, the 3S4 is capable of 0.27W (270mW) output with 90V at the anode. The output load resistance is 8000Ω, and the loudspeaker used by Cossor 3Ω. Hence, if the transformer needs to be replaced it should have a turns ratio equal to $\sqrt{(8000/3)}$ or around 50:1.

## Batteries

The set was designed to accommodate an Ever Ready 'All Dry 4' 1.5V LT battery, and two Ever Ready B104 batteries connected in series to provide the 90V HT supply. Batteries of this kind are no longer in production, of course, but it should not be difficult to use a combination of modern cells and batteries to supply the necessary 1.5V and 90V.

## Chassis Access

The chassis is accessed by first removing the rear metal casing by extracting two associated knurled nuts on the underside. Next the front metal casing is removed by undoing two 6BA screws on the underside and two self-tapping screws on the inside, accessible from the rear. For total access remove the speaker from its ring clamp.

***RB***

**In the next**

RADIO BYGONES

*Due out January 29*

**Radio Valves and Tubes**
**The Start of Wireless Broadcasting in the UK**
**RAF Receiver Type 1084**
**Why *Q?* – what was its origin?**

*Contents subject to last-minute revision*

**NEWS EXTRA**

# When the Ovaltineys Sang

The days when millions tuned to sponsored broadcasts from continental radio stations are recalled in a new booklet entitled *When the Ovaltineys Sang*.

The writer relates how stations like Radio Normandy and Radio Toulouse came to get on the air, and tells of the frantic efforts by the Establishment in Britain to stop the broadcasts.

Publication of the booklet, written by Ron Montague, Chairman of Southend United Nations Association, coincided with the staging of 'The Story of Radio' exhibition in the Central Museum, Southend during the summer.

*When the Ovaltineys Sang* runs to 24 pages, and is illustrated with programme schedules and advertisements of the time, and a map. Copies are available from **Ron Montague, 39 Orchill Drive, Benfleet, Essex SS7 2LS**, price £1.00 including postage to UK addresses.

If you offer a service or are staging an event of interest to vintage radio enthusiasts, send full details to Radio Bygones, 8A Corfe View Road, Corfe Mullen, Wimborne, Dorset BH21 3LZ, and we'll give it a mention in 'News & Events'.

Items for inclusion in our next issue, due out on 29 January 1991, must reach us by January 10.

# Saved by Radio

## Evolution in Air-Sea Rescue radio transmitters

*by Louis Meulstee*

Some time ago I received a reprint from a war time article 'German Dinghy Transmitters' which was a welcome addition to a manuscript on Air-Sea Rescue for which I had started collecting material quite a while ago. During my time in the Service I had been fascinated by the peculiar shape of the US manufactured AN/CRT 3, affectionately named 'Gibson Girl'. I later learned that its primary design came from war-time Germany.

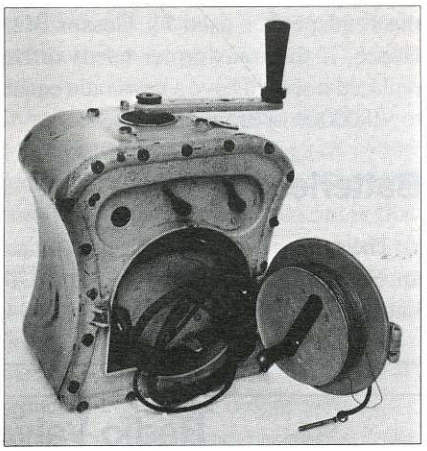
Emergency transmitters enabled ditched air crews to communicate their whereabouts operating on a frequency of 500kHz, used by international radio alarm signals. By using direction finding equipment, a rescue party could take bearings of the distress signals and determine their location or just 'home' on the signal by the aircraft's radiocompass.

## Air-Sea Rescue

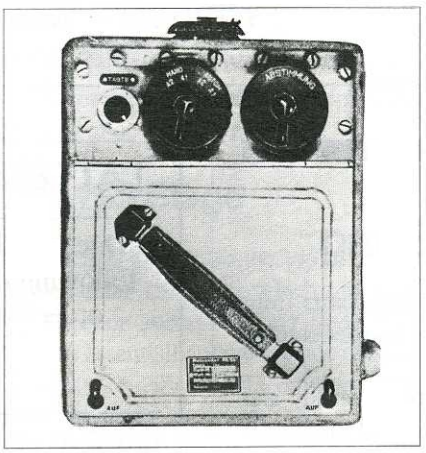
In the early days of long distance and overseas flying, a crude form of emergency radio was sometimes provided. Such aircraft carried emergency transmitters working on long wave or short wave (depending on the flight) which were powered by dry batteries. It was not until 1941 that the Germans introduced an ingenious emergency transmitter, designed by the German firm Friesecke & Höpfner. It was completely self contained, buoyant, practically waterproof, very small and painted bright yellow.

## Notsender NS2

The set, named NSG2, for Not Sende Gerät **2**, (emergency transmitter equipment, type 2) consisted of two parts, the NS2 transmitter container and the accessories container, usually stowed loose in the aircraft and attached to a rubber dinghy. Both containers were made from a light alloy. The accessories container held a kite, two balloons with filling tubes, two hydrogen generators and an instruction handbook, together



*German NS2 developed in 1940*
*Collection Arthur Bauer, Diemen, Holland*



*The NS2a transmitter, manufactured by Philips, had a similar performance but was mechanically simpler. The generator handle was normally fitted on top*
*Photograph courtesy Fritz Trenkle, Freising, Germany*

weighing 27 pounds. The range over sea was given as approximately 200 miles. Power was derived from a hand generator, with the handle fitted on top of the transmitter case. The transmitter had a quite unique ergonomic shape. When used it was held between the operator's legs, giving the impression of grinding coffee in an old fashioned hand grinder. A similar set, NSG2a, with similar performance but mechanically simplified, was manufactured during the war by Philips. Since no batteries were needed the set could remain in storage for long periods of time without service or attention and when needed it was ready for immediate service.

## Automatic SOS Code

When turning the handle of the hand generator (approximately 2 revolutions per second), automatic keying of SOS and long dashes in MCW or CW were transmitted. A moulded cam, mounted on a camshaft, carried a series of depressions operated the keying contacts. In addition, a hand key could be used to transmit other messages such as instructions to aircraft flying over. The simplicity of operation and automatic transmission permitted the set to be operated by any crew member.

## Kite and Balloon Aerial

The set operated on the international distress frequency of 500kHz (600 metres). To obtain a good range it needed a long-wire aerial of reasonable length. This was normally provided by attaching the aerial, 260 feet of stainless wire, to a box kite. It was reeled out by a unit mounted on the front panel of the transmitter.

The earth, consisting of 10 feet of stainless wire terminating in a sinker, was lowered over the side of the dinghy in the water. When lack of wind (less than 13 mph) did not permit the use of a kite, a 3ft balloon was used to raise the aerial. The balloon was inflated by a hydrogen generator, a tin can with a separate inflation tube. When opened, hydrogen was generated by chemical solid (lithium hydride or calcium hydride) coming into contact with water. An insulated grip on the inflation tube provided protection to the hand as considerable heat was generated.

## Crystal Control

The transmitter was crystal controlled, giving excellent stability in extremes of

temperature. The RF power output was 8 watts CW and 6 watts MCW. Two valves were employed: an AL5N oscillator-output valve and RE134 audio oscillator-modulator. An aerial tuning circuit, provided with a neon tuning indicator, compensated for variations in aerial length and capacity.

## Notsender NS1

The NS2 was, however, not the first German Air Force dinghy transmitter, as before the beginning of WWII (and recorded in use during the war) emergency transmitter set type NSG1 had been developed. The transmitter NS1 was originally part of a Lufthansa 'Kleinstation' developed in the 1930s as an aircraft station but later used only for emergency purposes. The NSG1 was really a makeshift solution for long range aircraft, to be replaced by NSG2. It operated on a frequency of 500kHz and was powered by dry HT batteries and an LT accumulator. Transmission (CW only) was automatic SOS, followed by a long dash, operated by a small motor, or alternatively hand-keyed Morse.

## Bulky and Awkward

The NS1 transmitter was mounted in a bulky weatherproof case painted bright yellow and weighed 50 pounds. The primary aerial consisted of five sections of aluminium tube to give a 17ft vertical rod, provided with a capacitive 'umbrella' top. This awkward and rather unstable construction was mounted on top of the transmitter unit and supported with four guys. A second aerial, 165ft of steel wire wound on a reel in the transmitter, could be flown on a box kite.

## Captured

In 1941 the British captured an NSG2 in the English Channel which formed the basis of a similar set. Very little redesign led to Transmitter Type 33, carried in RAF bomber and reconnaissance aircraft during the war. Strangely enough, the British did not use a special shaped container but used pads, mounted on the side of the set for this purpose. The circuit was basically quite similar to the NS2, working on 500kHz with a crystal-controlled oscillator-output valve and a second valve as 1000Hz audio oscillator-modulator. The hand generator delivered 6 volts LT and 350 volts HT. Automatic transmission of SOS or hand keying was provided.

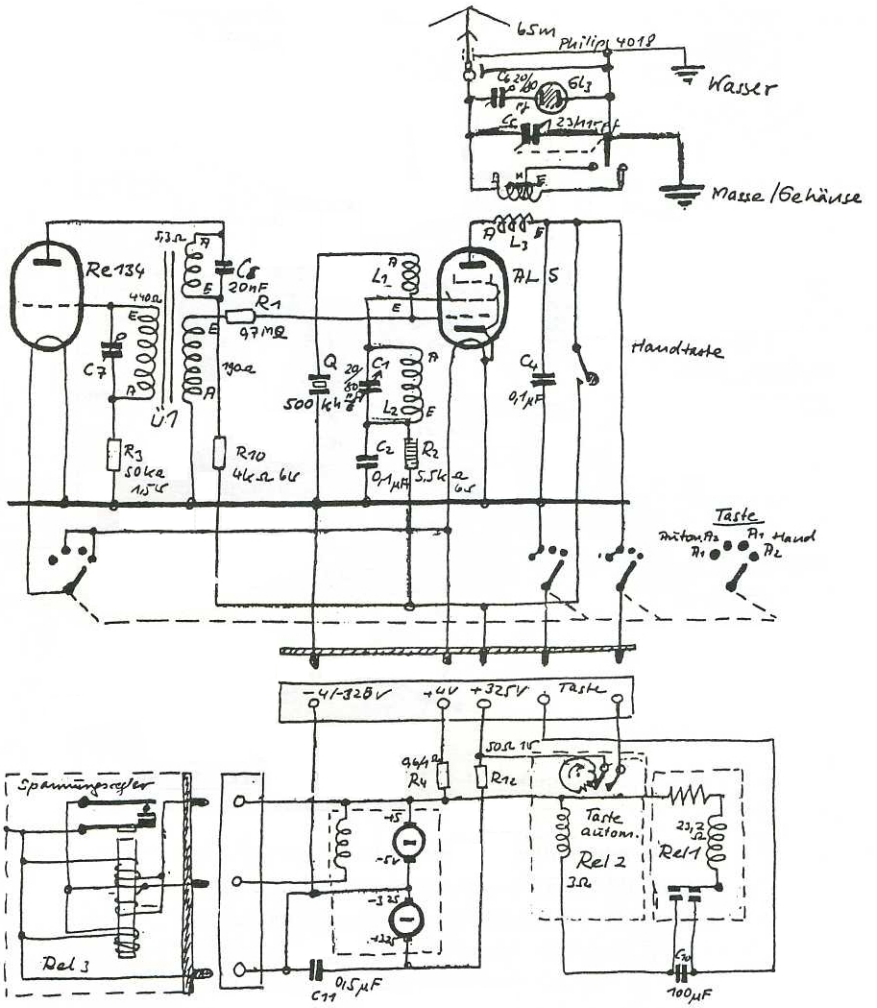
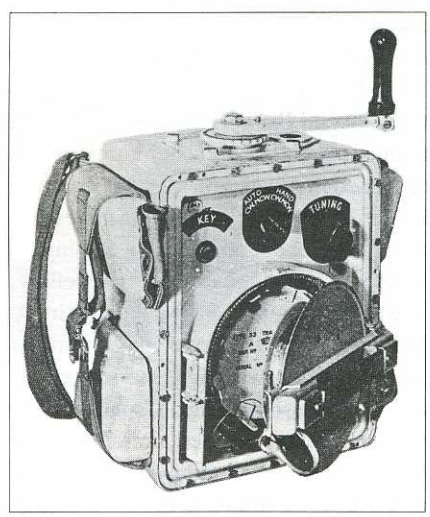



*Fig. 1 - Circuit diagram of German NS2*

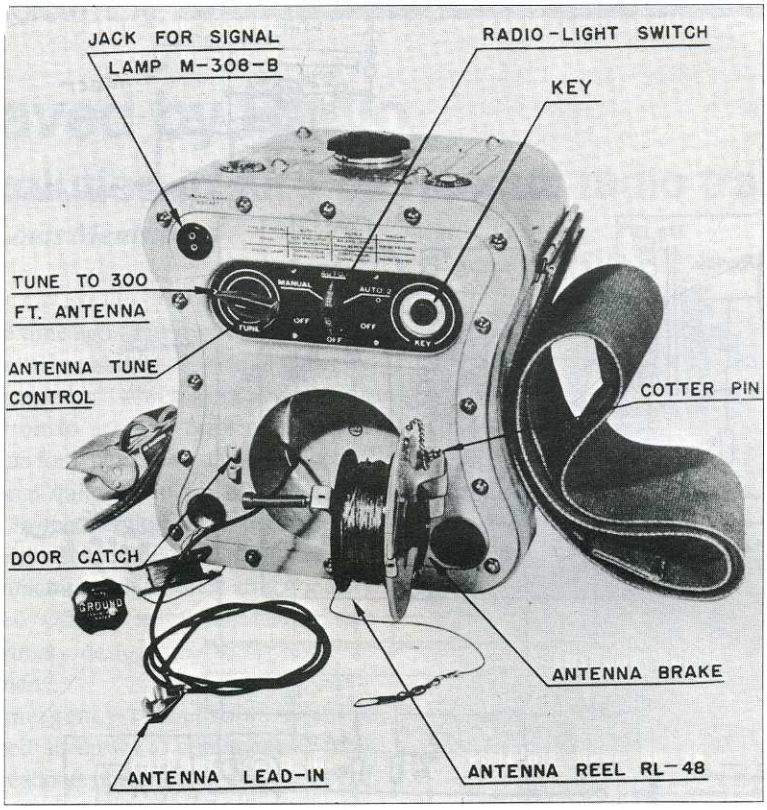
*Courtesy Fritz Trenkle*

## USA

In mid-1941 another captured German NSG2 set, together with development specifications, was taken with a military mission visiting the USA. One of their assignments was to seek a North-American manufacturer as the British did not have the capacity to produce such a set in very great numbers. Bendix Aviation Limited was approached and after the US Army and Navy became interested it was suggested that a joint Allied dinghy-set be developed. When the US became directly involved in the war the demand was speeded-up and an initial order for 11 600 sets was asked to be placed 'as soon as humanly possible'. The first sets were delivered in the last week of May 1942, initially by Bendix but later also assembled by a number of sub-contractors.




*British Type 33 dinghy transmitter, used in RAF bomber and reconnaissance aircraft during WWII. Electrically it was virtually identical to the NS2. The case did not have the peculiar ergonomic shape but external pads were used instead*




*USA-manufactured dinghy transmitter BC-778 (part of SCR-578) was a copy of the NS2, though internally it differed considerably. On top of the set a generator speed indicator light and aerial tuning indicator light were mounted within sight of the operator*

*Youth in bloom was personised by the 'Gibson Girl', created by Charles Dana Gibson, most famous artist and cartoonist of the late '80s and early 1890s. Every young girl tried to look as much like his drawings as Nature would permit*

## Superior

The mechanical construction of the SCR-578 or 'Gibson Girl' (the name taken from the narrow-waisted female drawings of 1890s fashion artist Charles Dana Gibson) was superior to both the German and British predecessors. It was manufactured in far greater numbers and remained in production after the war. The set consisted of a BC-778 transmitter unit and a number of accessories weighing 34 pounds. Painted the usual bright yellow, it was completely packed in a single padded yellow canvas bag. (Initial versions used two bags, the set proper and an accessories bag). Usually it was thrown from the ditched aircraft into the sea at the same time as the dinghy. It could also be dropped by a parachute, which was part of the set.

## 80rpm

The transmitter was not crystal controlled. It consisted of an ECO RF oscillator-output valve (12A6 tetrode), operating on 500kHz, grid-modulated by a 1000Hz tone oscillator (12SC7). The aerial tuning capacitor rotated through 360 degrees, during half of which a switch closed, adding an extra capacitor. RF power output was given as 5 watts. The range of the SCR578 was quoted as 200 miles (to aircraft flying at 2000ft). Power was derived from a double-voltage hand generator, delivering 28 volts LT and 330 volts HT. The nominal turning speed, approximately 80 revolutions per minute, was much less then the speed of the German generator. In addition to radio transmission, the set could be used as a hand-powered signal light, automatically keyed or continuously. It was intended to be used for visual signalling by night if an aircraft was heard. The M-308 signal lamp was plugged into a socket provided and strapped on the top of the head with the straps under the chin.

## Post-war Use

The SCR-578 was used until the late 1960s and early 70s, not only by the Air Force and Navy but also on civilian aircraft. Later versions of the set were the AN/CRT3, working on distress frequencies of both 500kHz and 8280kHz, and the AN/CRT3A operating on 500kHz and 8364kHz. Mechanically, it was virtually unchanged, modifications being carried out in the transmitter oscillator circuit and RF output circuit. Operation on 8280/8364kHz was crystal controlled.

## 1913

The use of a hand generator to provide power for a lifeboat emergency transmitter was not new. As early as 1913, in an article 'Wireless for Ships' Boats', published in *The Wireless World*, the Marconi Company announced the fitting of lifeboat radio sets on board two new liners. The sets were self-contained, transmitted on 1000kHz and received on 500 and 1000kHz. Power for the spark transmitter was normally derived from the lifeboat engine but the alternator could also be driven by hand should this engine fail. The receiver detector was a reliable (though rather insensitive) Marconi magnetic detector, hand driven by a small external handle. The aerial consisted of a semi-fixed 'L' type, 25ft

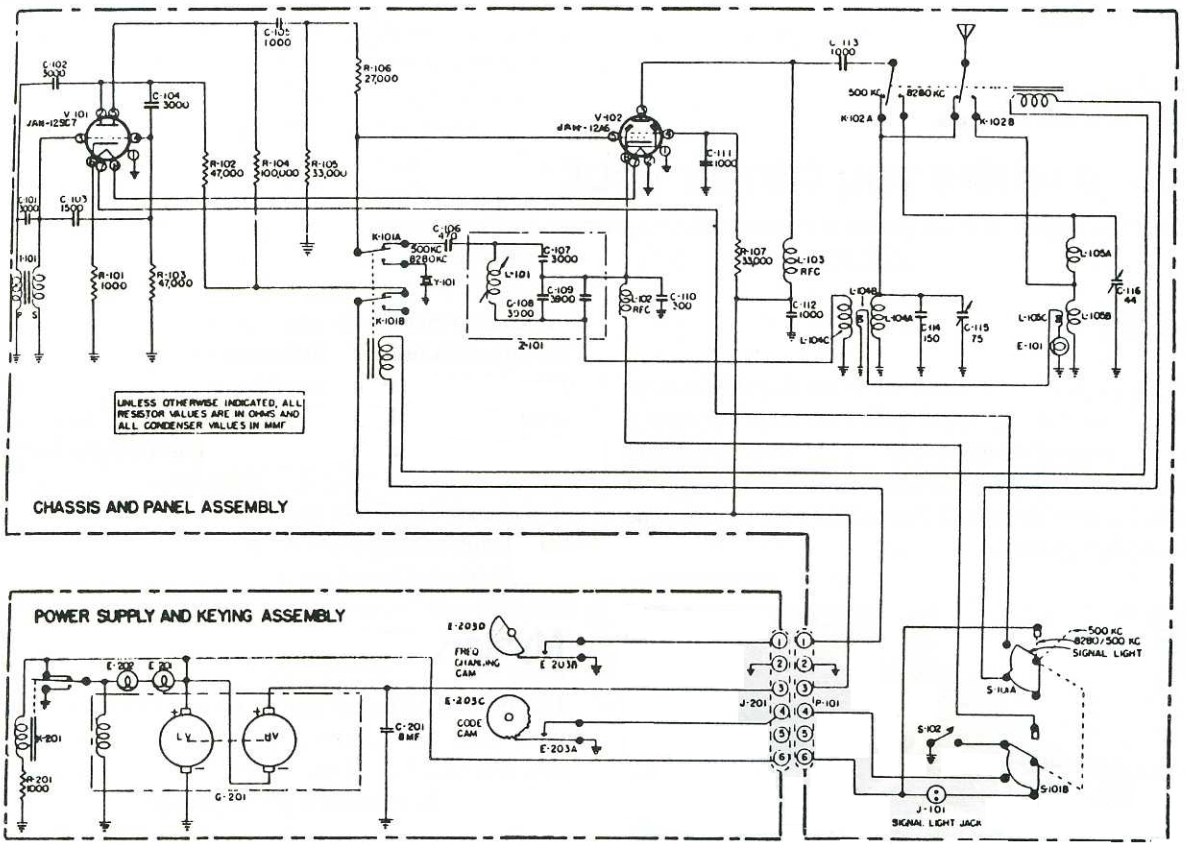



*Fig. 2 - Circuit diagram of the US-manufactured AN/CRT3 Air-Sea Rescue transmitter*

long and 25ft high, composed of four wires. The set was contained in a watertight aluminium box. It is doubtful, however, that this set would have enough power to give any notable range. After SOS was given by normal methods and the ship was abandoned, it could have been of use to assist rescue vessels searching the neighbourhood for scattered lifeboats.

## References


German Dinghy Transmitters, *AFARNEWS*, June, 1989, pp. 11 – 13.

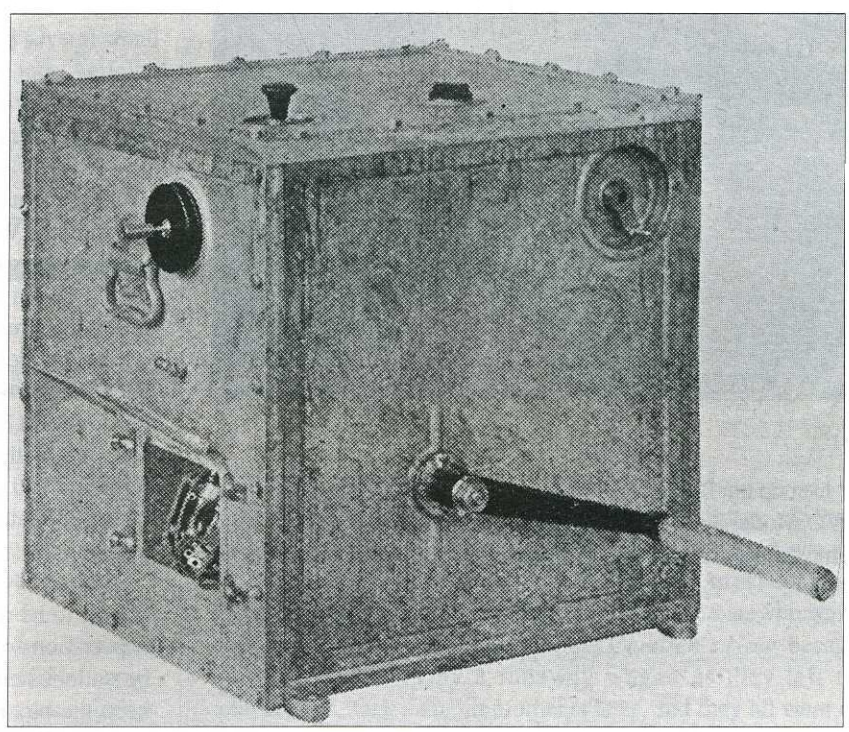
*Bordfunkgeräte*, (Aircraft-radio) by Fritz Trenkle, Bernard & Graefe Verlag, Koblenz, ISBN 3-7637-5289-7.

Prelimary instructions for emergency transmitter SCR-578, April 1942.

SCR 578-a/b, *Handbook of maintenance instructions*, AN 08-10-94, Aug 1943.

US Army in World War II, The Technical Services, THE SIGNAL CORPS: *The Test*, US Government Printing Office, 1957, Lib. of Congress 56-60003.

Wireless for Ships' Boats, *The Wireless World*, Vol. 1, 1913/14, pp. 186 – 187.

*Emergency transmitter/receiver manufactured by the Marconi Company in 1913. Primarily intended for fixed installation on board a lifeboat and powered by the engine. The aerial is connected to a plug on the side. The Morse key is located on top of the instrument. The large handle drove an alternator, giving power for the spark transmitter. The second small handle operated the string of the magnetic detector*

## Acknowledgements


Thanks are due to Mr Fritz Trenkle for his kind advice on German-manufactured rescue sets. I also wish to thank Arthur Bauer (PA0AOB) for permission to photograph his NS2. ***RB***

# Feedback...

## The page where you can air your views

*Letters should be original and not copied to or from other magazines*

### Photo Call

In 1947 when I was a Radio Mechanic in the Royal Signals in Germany, I read that the AVO company were holding a photographic competition. The photo was to show a working situation using their equipment. I decided to enter, vowing that should I win, I would share the £5 prize 50/50 with the colleague who took the photograph.

I set up the BC312 (without its case), the AVO oscillator and AVO Model 8 meter, to show a typical situation of an IF 'can' being adjusted. We won the competition and duly received the prize.

***Tony Naylor G3GHI***
***Kenley, Surrey***

### Versatile Valve

The photograph of the RV12P2000 valves on page 6 of *RB* No. 7 brought back a memory from my days in the Royal Signals. I was in the army of occupation just after the Second World War, stationed at a Nazi seaplane base at Schleswig in Germany.

Radio sets for personal use were unobtainable, and a few sharp German civilians were knocking up TRF medium wave receivers of a basic nature using the versatile RV12P2000 valve in all the stages, including two in parallel for output.

These worked well enough for us to receive AFN (the American Forces' Network), etc., and were acquired in exchange for cigarettes or soap which were virtually unobtainable for the Germans at that time.

By the way, I had to grin at the Book Review title 'Radio Servicing' by G. N. *Patchett*; I hope it wasn't a 'Bodge Job'!

***Gerry Baker***
***N. Yorks.***

### Mystery Object

I have a hunch that the 'wotzit' pictured on page 22 of *RB* No. 7 is medical. My father was a GP from the early 1920s to late 50s, and while I don't recognise it as an 'acquaintance', it seems to have an electromedical physiognomy!

***Robert C. Marshall***
***Canterbury***

### An Unlikely Source

The excellent article by David Rudram, 'Radio and Television Interference Work in the 1950s' (*RB* No. 6) reminded me of an occasion early in 1950 when I found myself unofficially assisting the GPO in a matter of interference detection, with somewhat unexpected results.

The incident took place in the small town of Stalybridge, about seven miles east of Manchester. The Birmingham TV transmitter at Sutton Coldfield had recently opened and although we were well out of the service area a number of Stalybridge residents had purchased receivers in the hope of squeezing a picture of entertainment value out of the 50µV/metre or so available.

Fortunately the noise level was low enough for a passable picture to be resolved in many cases, although in keeping with expectations of the day it was usually essential for someone to be stationed close to the line and frame hold controls in order to keep the picture steady. A low noise level, that is, except for one blinding flash which demolished every picture in the town at three or four minute intervals. This completely ruined reception in the area.

The pattern showed two horizontal bars, so it was clearly a 50c/s source, probably a faulty thermostat judging by the regular repetition frequency. As I had been a TV development engineer at Ferranti I was asked to look into this nuisance. I immediately contacted the GPO Radio Department and an official turned up without delay. A visit to a couple of complainants clearly demonstrated the intensity of the interference.

Back to the van, and the technician selected his directional field strength meter. This was the moment! Sadly, however, his

instrument was not sensitive enough to respond at all to either the TV signal or the interference. He explained that unless interference was sufficient to be detected, nothing could be done by his department. This was fair enough, because after all we were well outside the service area of Sutton Coldfield.

However, I had just constructed a TV receiver using ex-government components and driving the famous VCR97 six inch radar tube, so I resolved to use this to track down the offending QRN. When things had quietened down round about midnight I rigged the gear together all laid out on a wooden plank, and dragged this along the pavement using a long extension mains lead and a circular directional aerial. Although of course the BBC had long closed down, the interference was unmistakable. The local policeman who materialised from the shadows was understandably incredulous to day the least, and never left my side during the whole operation.

I managed to fix two points with sufficient accuracy to confirm that the source of trouble lay in the general direction of the town centre, where there were a number of industrial plants of various sizes. Next morning I contacted my GPO accomplice again, and in due course we found ourselves in the town centre. This time he was able to pick up the noise, and we were on the trail. Our experiences then followed a very similar pattern to that described by Mr Rudram, including an occasion when, whilst the technician was wearing headphones and slowly rotating his aerial, a backyard door opened. The dear lady who emerged almost fainted when confronted by this aggressive looking being.

Having located the area, the GPO man visited several small establishments located in the vicinity of the famous Aerialite works, but with no success. As Aerialite were well known manufacturers of anti-interference equipment amongst other things, it never occurred to us that the fault could be within such august portals. But it was! The factory was visited as a last resort and a faulty thermostat was rapidly located. It goes without saying that within ten minutes the fault had been cured for good.

***Charles Langton***
***Thirsk, N. Yorks***

## Pioneer Exploits

As well as being interested in old radios, in particular car radios, I spend a lot of time with early Austin Healey classic sports cars. These cars came about by the efforts of Donald Healey CBE, who is now a 'silent key'. His book *My World of Cars* has been completed and published recently. The book is fascinating reading and describes his interests which, as well as cars, included early radio activity. In fact he went into production under the name Perraphone Radio Company (see below) located at Perranporth in Cornwall.

PERRAPHONE
RADIO COMPANY

I would be very pleased to hear from any readers who may have heard of these sets and can supply any details. Better still, if any have survived, I would be most interested in seeing one. I am trying to track down the one that Donald Healey kept, but so far without much success. If I have better luck, I will let you know.

***John Harper, 7 Cedar Avenue***
***Ickleford, Hitchin, Herts SG5 3XU***

**TAILPIECE**

# Wireless Tales from the Loft

***by Tony Hopwood***

You hear all those people downstairs? That's the family, mostly Jack's, here for his wake, in at the death as you might say. I don't suppose Iris will want to stay here now he's dead, so I may not have much longer up here in the loft. It seems like yesterday when Jack bought me as a present for Iris. That was nearly sixty years ago, the year they married and moved here.

I was nearly the first all-electric, that's mains to you, wireless round here. I wasn't cheap. In those days twenty guineas would keep a family for a month, but Jack had a good job, and could manage the 'easy terms'. Somehow he got Iris out of the house one Saturday so the local wireless man could fix me in the lounge. I shall never forget how happy she was to have music during the day when Jack was at work, and how they sometimes turned me down low while they made love in front of the fire.

I was part of a growing family as the twins, Louise and William came along. As they grew up, there was always my *Children's Hour* before they went to bed. They were too young to understand why Iris wept when the old King died, and again when the new King broadcast for the last time before turning his back on the throne to marry for love. I think they all loved me a bit too because I could make them laugh, cry or dance, but that day Louise and William were late home from school, I saw Iris rush to the door to find a teacher and a policeman who gently told her that her children would miss *Children's Hour* because they had been hit by a runaway wagon as they left the playground. Jack came in moments later, and they all went off with the policeman.

The grey time of grief lasted for months – Jack worked harder than ever to delete that awful day. Iris would wander round the house dusting and arranging, then re-arranging, and switch me on and off a dozen times a day. Jack did his best to cheer her up, but the one thing that might have done the trick never happened – there were no more Children's Hours.

## Gathering Clouds

As they adjusted to life on their own, I became one of the family again. Every evening they switched me on for the News,

rather than waiting until after supper for a show. Then Iris suddenly joined the WRVS, instead of inventing housework all day. New and foreign names began to rattle from my loudspeaker, and the variety programmes gained an extra frenzy to draw attention from the gathering war clouds.

Jack started to get home for the first News at 6 o'clock and, yes, I remember the day I went wrong, and he got quite cross with Iris, accusing her of knob-twiddling. Then they sat and stared at each other after supper, not knowing what to do – not like the old days in front of the fire! Next day the man came and changed a valve, and said I was as good as new. They listened to me more and more as Chamberlain returned from Munich with 'peace in our time'. He fooled no-one. What could you think when every night there was something on about Air Raid Precautions, or the call-up?

Jack wanted to volunteer, but Iris wouldn't let him, so they had a row which ended with Iris stamping off to bed, and Jack putting Oscar Rabin's Romany Dance Band on full blast until 'Goodnight everyone... Goodnight' and whisky brought domestic peace.

## Off to War

Then, one late summer Sunday I told them we were at war with Germany. Iris started to weep quietly, and Jack comforted her. A buff envelope came, and Jack went. Iris was a driver for the WRVS, and started work in some shadow factory as well, so her dusting went by the board. She never missed the late News though, and I could see that she was thinking of Jack in France as I intoned the litany of defeats in those hot summer days of 1940.

Then Jack came back, at least most of him did. He left a foot in France, and spent many hours listening to me while he got better, then bored. That winter after dark, until Iris got back from war work, he'd spend hours trying to pick up foreign stations. One evening he was listening to Lord Haw-Haw when Iris came in. She was furious with him until he showed her what a load of rubbish it was, then they sometimes listened and laughed together, but I could see they worried about what they heard when 'Chermany' was calling.

There wasn't a lot to laugh about. The Blitz had started, and although we were well out of town, Jack and Iris would stand quietly in the garden and watch the glow and flashes in the sky, and I would notice how the mains started to flicker when there was a big raid on.

Jack went back to work with a stick and a tin foot, and although they both worked long hours, they always listened to the late News before bed. By the end of the War, I was pretty worn out too, and spent my first and only week away for repairs. When I came back, they had another set – one of those American midgets for the table by the bed. Iris said she still preferred my tone, but Jack said he was damned if he would hump me upstairs just to make bad news sound better!

## Home, Light and Third

Then they changed all the station names. All my Nationals and Regionals became Home, Light and Third. That's when Jack stuck those bits of paper on the dial, so Iris could find the stations without her glasses. Even though we were at peace, things seemed to get worse for a time, with a terrible winter, power cuts and rationing, so I was glad to bring them Tommy Handley, Arthur Askey, and Co. in the evenings, although I think Iris preferred *Housewife's Choice* and *The Brains Trust* during the day. Life gradually improved, as 'make do and mend' of wartime became a memory. Suddenly, we had a Queen, and a new Elizabethan age. I think that was the last time I made Iris weep, when they buried King George.

Jack's work was paying well, and I knew something was up when a young man came to fit an 'H' aerial to the chimney. Then they moved me into a corner, and put a television on MY plug. We had a houseful of Jack's relations for the Coronation, all sitting round like sparrows waiting for a worm, with the curtains drawn and everyone peering at the flickering little screen.

That was the beginning of the end for me. Jack and Iris sat hypnotised every evening in front of that box, while I gathered dust and fluff in the corner. Then one day, they had a plumber in to alter the bathroom, and Jack got him to put me in the loft, because he couldn't manage the steps with his foot. And that's where I am now, but for how long?

## What am I Bid?

'Lot number 217. Well ladies and gentlemen, here's a real radio, a proper wireless set as you might say. It says on the back that it's a Kolster Brandes. Believe it or not with a name like that, made in Sidcup! This is sold as seen, with no guarantee that it might work – it certainly won't get the old programmes, that's for sure, Ha! Ha! It's a nice bit of wood though – make a good drinks cabinet if you strip out the works. Now! Who'll start me off at twenty pounds, or should I say guineas, for this historical artefact?'

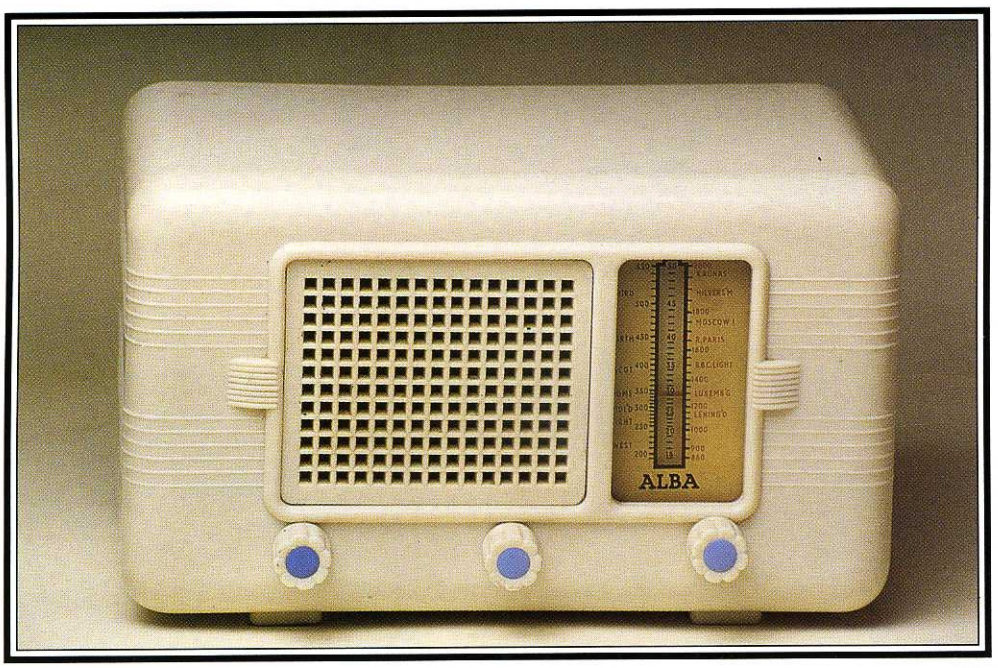
***RB***




Published bi-monthly by G C Arnold Partners, 8A Corfe View Road, Corfe Mullen, Wimborne, Dorset BH21 3LZ. Printed in England by The Friary Press Ltd, Dorchester, Dorset. Subscription £13.50 post-paid UK, £14.50 overseas inc Eire, for six issues. Overseas airmail rates on request. Payment welcome by Access/Eurocard/Mastercard or Visa. Overseas cheques or postal orders must be in Sterling. RADIO BYGONES is sold subject to the following conditions, namely, that it shall not, without the written consent of the Publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of Trade at more than the recommended selling price shown on the cover, and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever.

The Cossor Model 464AC SW/MW/LW 5-valve superhet was released in April 1946, price £18 0s. 0d. including Purchase Tax. Its Bakelite cabinet was available in plain black, or sprayed green (as here) or ivory

# MUSEUM PIECES




The Alba Model C112 'Midget' LW/MW/SW 5-valve AC/DC table radio measured only 5 x 8 x 4½in. When released in 1947 it was available in white only, but in 1949, makers A. J. Balcombe Ltd. added ivory, pink, green, blue, 'walnut' and black to the range of cabinet colours available

The Marconiphone Model V1, introduced in 1924, was a 1-valve set for headphone use. The mahogany cabinet measured 7½ x 8¾ x 6¾in.
The set was supplied with a single plug-in range block containing aerial and reaction coils covering the standard medium wave band. A total tuning range of 300m to 4600m in six bands was available by the purchase of additional range blocks

# MUSEUM PIECES

Following the launch of BBC VHF FM transmissions in 1955, set-makers tried various ways of providing reception of the new services.
There were AM/FM receivers covering long, medium (and perhaps short) and VHF bands, FM adaptors or tuners for connection to audio amplifier inputs or to the pick-up sockets on AM radios. And there were dedicated FM receivers such as this 7-valve Ekco A274, covering just Band II, which was then limited to 87.5 – 100Mc/s in the UK