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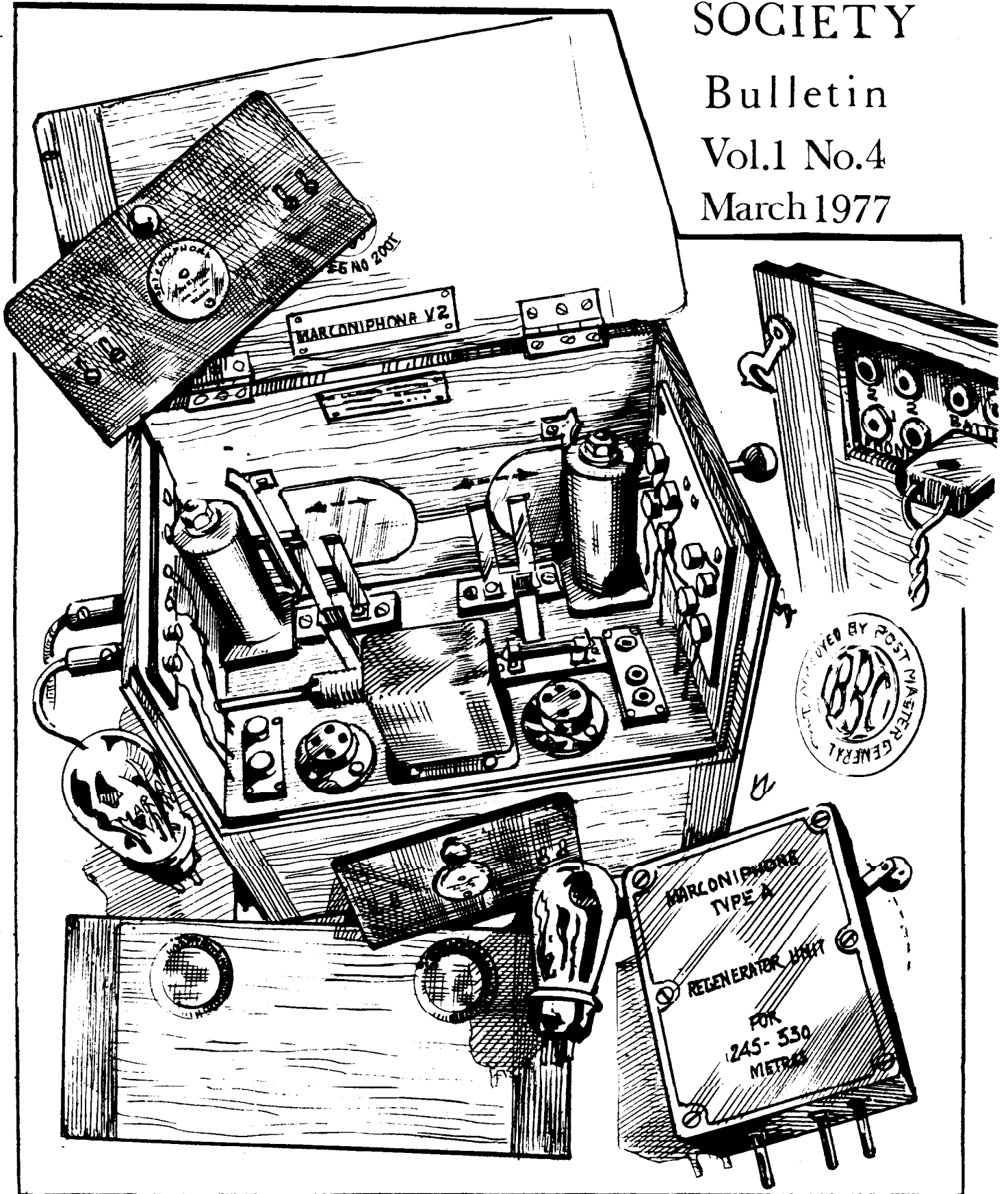
VINTAGE WIRELESS

SOCIETY

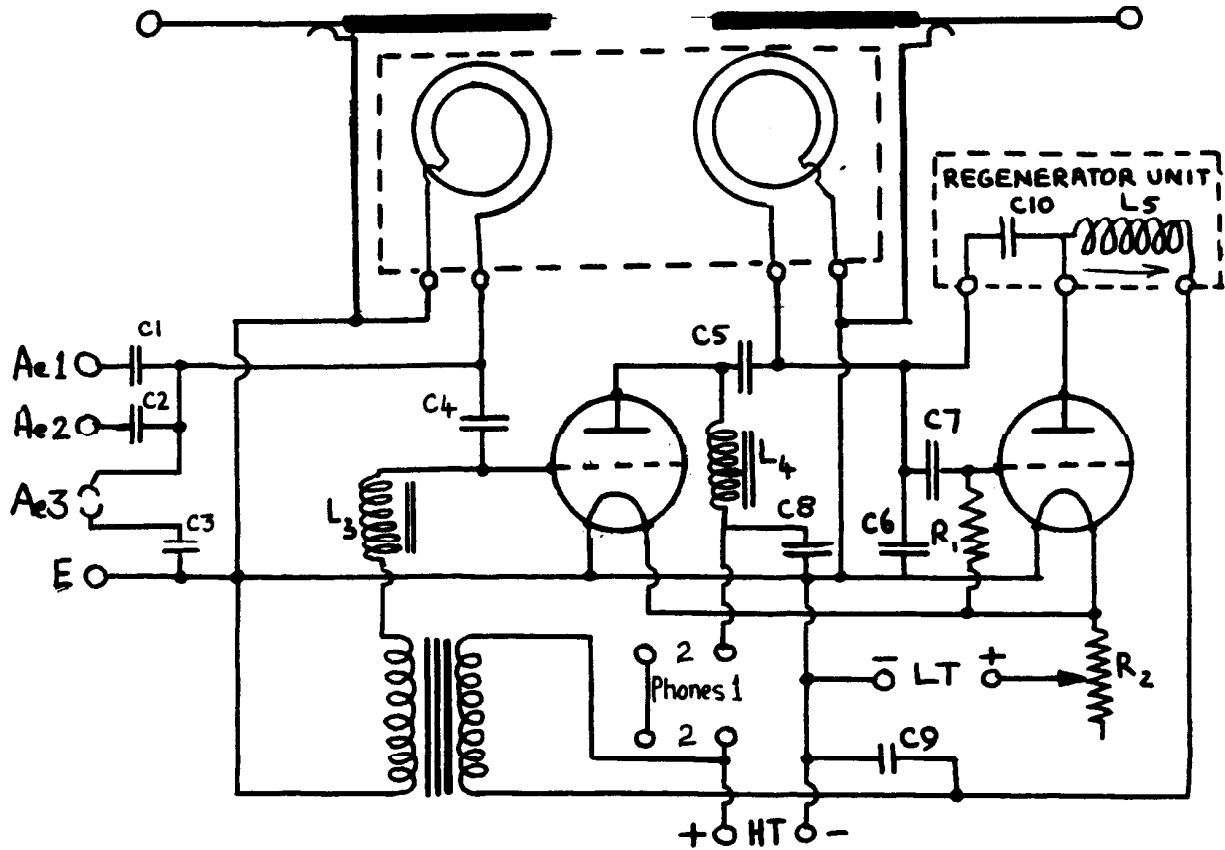
Bulletin

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THE MARCONIPHONE V2



The Component Values for the V2

C1	160pF	R1	2M Ω
C2	280pF	R2	5 Ω
C3	60pF		
C4	290pF		
C5	300pF		
C6	310pF		
C7	265pF		
C8	3.95nF		
C9	3.75nF		
C10	45pF (in the 245-530m unit)		

	300-390m	390-530m	1300-1700m
L1	410 μ H 6.8 Ω	640 μ H 2.2 Ω	8500 μ H 29 Ω
L2	130 μ H 1.1 Ω	240 μ H 5.0 Ω	2800 μ H 7.8 Ω
L3	34.0mH 1.1k Ω		
L4	320mH 1.1k Ω		
L5	960 μ H without spade 420 μ H with spade 8.3 Ω (245-530m unit)		

L.F. Transformer: Ratio 3:1 over the range 150Hz to 700Hz rises to 5.5:1 at 1kHz

D.C. Resistance: primary 550 Ω secondary 3000 Ω

Valves: D.E.R. Fil, 1.8v 0.35amp HT, 30-50v anode impedance 32000 Ω

Or D.E.3. Fil, 2.8v 0.06amp HT, 40-80v anode impedance 18500 Ω

Recommended headphones: Sterling or Marconiphone 2000 Ω

Aerial: use Ae1 if aerial is between 60 and 100ft (18 and 30metres)

use Ae2 if aerial is between 25 and 60ft (7.5 and 18metres)

use Ae3 if aerial is less than 25ft (7.5 metres)

THE MARCONIPHONE V2 REFLEX RECEIVER - OR - 2001, A 'SPADE' ODYSSEY.

By A.R.Constable

Many collectors of early British Wireless equipment own a Marconiphone V2 two valve reflex receiver. This set, which is illustrated on the front cover, is well known to all collectors for its 'distinctive' appearance and its 'bizarre system of spade tuning. The 'V2' was introduced to the domestic market in 1922 and was first shown to the public at the 'All British Wireless Exhibition' which was held at the Horticultural Hall in London from September 30th to October 7th 1922. It appears to have been still available until as late as 1927 although it seems to have 'turned up' on the surplus market before this date. There is the story, the origins of which can be traced and is probably authentic, of a large number of V2's being sold off cheaply in order to make room for something else. These sets were seen by one of the directors of the Marconi Company - in a shop window somewhere near Tottenham Court Road - at knock-down prices. He then arranged for the sets to be bought back at a not inconsiderable loss for the purpose of having them end their lives in a more dignified manner on a bon-fire?

The peculiar tuning arrangement consisted of a copper spade brought across a flat coil and was used in many of the early Marconiphone receivers. In one form or another this type of tuning arrangement was used in the 'Crystal Junior', 'Crystal A', 'V1', 'V2', 'V3', 'V4' and the 'RB10' (a drawing of the RB10 appeared in the BVWS Bulletin Vol.1, No.3, p.13). As far as I can discover, the system of spade tuning was designed by C.S.Franklyn, one of Marconi's design engineers who was responsible for many early circuit innovations including his well known 'retroaction' circuit of 1913.

Although in principle the reflex receiver should have a better performance than a conventional two valve (det/L.F.) set, I have never found this to be the case. In the 1920's, the manufacturers claimed that, "...by means of a special circuit... ..the soundsare magnified to a degree which has hitherto only been possible by using three valves." Well, this claim looks a bit dubious now and I know that some of the early customers were not exactly enthralled with its performance. In normal operation the V2 was intended only for head-phone operation and when loud-speaker output was required it was achieved in conjunction with the Marconiphone Two-Stage Voice Amplifier Type A2 which came in a cabinet similar to the V2.

The circuit of the V2 was published in H.M.Dowset's Wireless Telephony and Broadcasting (Gresham 1923) Vol.2 p.72 and in Harmsworth's Wireless Encyclopaedia (1923/24) Vol.2., p.1400. Neither of these circuits included component values so it was thought worth including them in the circuit accompanying the present article. The component values were measured directly from my own set and there may well be slight differences between these values and those measured on any other set. If any large discrepancies come to light, corrections will be published in subsequent issues of the Bulletin.

The V2 which first appeared in 1922 can be seen illustrated on p.857 of the September issue of Wireless World (1922). Collectors will immediately notice the absence of the plug-in regenerator unit which provided reaction in subsequent models. I do not know if a V2 without regenerator unit was ever sold to the public and would be very grateful for any factual information which any reader is able to provide on this subject. Careful inspection of the early photograph in the Wireless World shows that this model, as would be expected, had no BBC transfer inside the lid where it normally appears. On the first models of the V2 sold, the BBC transfer appears in the middle of the lid together with the Post Office Registration Number 2001. From the lists which appeared in the last issue of the BVWS Bulletin, it will be seen that this set was therefore the second two-valve wireless set approved for sale to the public by the Post Master General under the new regulations relating to the British Broadcasting Company. The G.P.O. number 2000 was given to a two valve set made by G.E.C. However, all the V2 receivers owned by private collectors that I have seen or heard about bear the G.P.O. number 0175 and have acquired the new title 'V2A Long Range Model'. Despite a careful search, no evidence has so far come to

light of any differences in the circuits of the two sets. Yet, if there were no difference, why did the Post Office issue two numbers??? I suspect the first one (2001) was issued to a prototype V2 without regenerator unit when it was submitted to the Post Office for approval early enough to be first on the list..nearly. A V2 without reaction must have had a pretty poor performance (even poorer than with!), and the addition of reaction must have required a re-submission for a new number. But, pending the granting of approval on the new version of the V2, the number 2001 seems to have been used on some sets with the regenerator unit! When the new number (0175) arrived, the set was re-named the 'V2A Long Range Model'. This whole interpretation is quite tentative and awaits the discovery of more factual information before it can be authenticated - or otherwise. In the adverts which appeared in 1923 (e.g. Amateur Wireless April 21st 1923, p.537) the Marconiphone V2 was described as: "Marconi's latest a new and improved Two-Valve Marconiphone has been perfected and is now on sale." Advertising of this sort only hints at the truth - it never reveals the facts.

The transfers on the inside of the lid usually consist of a BBC stamp with a G.P.O. number (0175) immediately under it and a rectangle bearing the words, 'Marconiphone V2A' on the top row and the words 'long range model' on the bottom row. But on earlier sets the rectangle is much larger and simply bears the words 'Marconiphone V2'. It also appears that a later version, manufactured late 1924 or later, had no G.P.O. registration number on the lid.

Inside the set, at the back, above the range block, there is usually a rectangular ivory plate bearing the words: 'Marconiphone V2A' on the top line, 'Type R.B.1.B. Long Range Model. M.19' on the second line, and 'Inst. No. S/E 1694' on the bottom line. (Of course the number on the bottom line is different for each set - 1694 is the number on my own set.) Many of the early V2 sets were in fact made at the Plessey Company, Ilford, East London - their first order was for 5000 sets. The retail price of the V2 goes something like this:

1922	.....	£13.6.6d	....or	£19.4.6d	complete with valves, head-phones, batteries and royalties.
1923	.....	£16.3.6d	....or	£24.0.0d	" " " " " "
1926	.....	£10.5.0d	....or	£15.16.2d	" " " " " "

'Complete' in each case meant with two D.E.R. valves, one 42 volt H.T. battery, one 2 volt 40 amp hr accumulator, one pair of head-phones and included royalties.

The plug-in range boards normally supplied with the V2 were the B621 300-390m and the B622 390-530m, and the usual regenerator unit supplied was the B651 and covered the range 300-500metres. Eleven range blocks were available to cover the whole range from 185m to 3200m and there were six different regenerator units covering the ~~same~~ range. Other odd range blocks and regenerator units which do not appear in the normally available Marconi Catalogues are known to exist - e.g. range blocks 245m to 305m and 340-440m and regenerator unit 245-530m.

I have measured the wavelength range of some of the range blocks and in each case the stated values are reasonably accurate. The low wavelength figure applies when the tuning spade is pushed right in and the high figure applies when it is pulled right out. As well as reducing the inductance, the spade shunts the coil with about 30pF when pushed right in. The tuning spades are normally pulled in and out by spherical nickel plated knobs attached to the ends of rods and the rods have notches in them to serve as markers. There was also a V2 version which used a differential screw to move the spades in and out and small pointers attached to the spades ran over ivory scales. I don't think these different tuning arrangements have any dating significance but they might well relate to the different sub-constructors if only one knew the facts.

The D.E.R. valve (Fil. 1.8 volts, 0.35 amps.) was normally recommended for the V2 for which a 2 volt accumulator was the correct L.T. supply. There was also a dry battery version for which the D.E.3. valve (Fil. 2.8 volts, 0.06 amps.) was recommended and this model had a different filament resistance and, apparently, some modified battery fixing arrangement inside the cabinet. The correct L.T. battery for this model was a 4½ volt dry battery - the set then becoming something of a 'portable'.... just about the right size to strap to the running board of the old Bently!

Using the correct D.E.R. valves in the V2, the performance is incredibly poor. The tuning is 'flat' and the stability of the reaction control leaves a lot to be desired. Selecting valves from a wide spectrum of types enables one to find a 'best' pair - but the performance remains far worse than any straight two-valve receiver that I have tried.

From the circuit it will be seen that the first valve functions as an H.F. amplifier, the second as a grid leak detector and the L.F. output from the second valve is then fed back via the transformer and the choke L_2 to the first valve. The first valve then comes into play again as an L.F. amplifier and the audio signals which are blocked by C_5 pass through L_1 to the head-phones. The H.F. stage and the detector are both grid tuned. The regenerator functions by means of a variable reactance in the detector anode circuit allowing more or less feed back to the detector grid. via C_{10} . As one might expect, the variable reactance in the anode circuit consists of a copper plate moving across a pancake coil - it is really quite difficult to get away from the 'spade' principle in these early Marconi domestic sets.

With all its weaknesses, the Marconiphone V2 is of historical significance and, as far as the public were concerned in those far off days this was in no small measure due to the 'Magic of Marconi the Mastermind' - the publicity men made sure of that! For the modern collector, endowed with a little hindsight, there may be a lot to smile at in a superior sort of way but, my goodness, he has to have one in his collection!

ELECTROLYTIC RECTIFIERS

By Philip Beckley

It has been known for many years that various electrodes dipped in certain conducting fluids give rise to non-ohmic conduction so that more or less efficient rectification takes place.

One very early wireless detector used a very thin platinum wire dipping into nitric acid as a radio frequency detector. Power rectification has also been accomplished by electrolytic rectifiers. In the 1920's some use (especially amateur) was made of the Noden Valve as it was called. This device consisted of a pair of electrodes, usually aluminium (anode) and lead (cathode) immersed in an electrolyte of borax solution or ammonium phosphate solution.

The rectifying action was not perfect (efficiency up to about 70%) and such cells were troublesome to make up and maintain but could be home made and were much cheaper and less destructible than vacuum valve rectifiers.

There was competition from vibrating reed synchronous rectifiers and rotary converters, but again these were relatively expensive or required precision engineering to make them.

For battery charging, 2lb (1kg) jam jars or 7lb (3kg) stone jam jars could be used depending on current demands. Usually four of them in a bridge circuit were employed. For high tension supplies a rack of boiling tubes could be assembled with four groups of cells in bridge formation, each group containing sufficient cells in series so that each cell received about 50-70 volts. To make up cells electrodes of carefully cleaned lead and aluminium were cut out and joined to terminals and means to suspend them in the electrolyte. Such cells were messy to make up and suffered from 'creep' as crystals of salt formed up the sides of the container as water evaporated from the liquid inside. One remedy for this was to float paraffin oil on the surface of the electrolyte.

When first made up the cells did not rectify until 'formed' by the passage of direct current rather as an electrolytic condenser (to whom the Noden Valve is 1st cousin.) is re-formed after a period of disuse. The construction procedure then was:- 1) Find jars, 2) Build a rack for them, 3) Obtain salt and make up solution, 4) Cut out, clean and mount electrodes, 5) Form electrodes (use a safety lamp in series till rectifying film has formed on anode), 6) Add paraffin oil, 7) Put into service.