MONASH UNIVERSITY

Department of Electrical and Computer Systems Engineering

INVENTORY of GRAHAM BEARD MEMORIAL COLLECTION

APPENDIX

[illegible] 1/1
Metrology Section
N.M.L.
4/4/75

To Mr A.C. Jones
ARL

Dear Allan,

Interval from 2 inch to 38 inch graduations measured

in July '58 35.999 99 old inch

in Aug '64 35.999 91 new inch (25.4 mm)

Converting the July '58 value to 'new inch' gives

2/38 interval 35.999 92$_8$

i.e. shortened by 0.000 01$_8$ inch in 36 inch over 6 years

As the 58% Ni Steel bars shortened slowly & progressively it can be assumed that the present size could be derived from the 1964 certificate allowing a further shortening of 0.000 001 inch per inch. You may wish to ignore this.

Kind regards

Cliff Stevens

COMMONWEALTH OF AUSTRALIA

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION

NATIONAL STANDARDS LABORATORY

REPORT

ON

40-INCH SCALE

DRT INDEX No. 68147

For: Defence Standards Laboratory, Department of Supply.

Reference: Letter P5/400/3 dated 12th May, 1958, per J.C. Stevens.

Description: A 58% nickel steel bar having an H section and approximate dimensions 40.5 inch x 0.93 inch x 0.93 inch. The upper surface of the web is highly polished and is ruled throughout the range 0 to 40 inch in intervals of 0.05 inch and numbered 0, 1, ..., 40 at the inch graduations.

Maker: Societe Genevoise, Geneve, Switzerland.

Marking: Acier Nickel 58%.
20°C, No. 3699
NB 62637.

Previous Calibration: Refer to "Certificate of Examination of a 40-inch 58% nickel Steel Scale" M.L. 23-47, M.16977 dated 10th December, 1947, issued by the National Physical Laboratory, Teddington.

The length of the interval 2 to 38 inch of this scale has been compared with a reference standard at the National Standards Laboratory.

All measurements were made to the centres of that position of the transverse lines which is contained between the pair of longitudinal lines. Microscopes of approximate magnification x 100 were used. During the measurements the bar was supported horizontally on two symmetrically placed rollers 22.7 inch apart, at the positions indicated.

The mean measured length of the interval 2 to 38 inch was 36.000 13 inch at a temperature of 20.324°C, the mean temperature of observation.

Using the equation

$$L_t = L_{20} \{1 + 0.000\ 011\ 251\ (t-20) + 0.000\ 000\ 00489\ (t-20)^2\}$$

(where L_{20} is the length at 20°C and L_t the length at t°C) established by the

/National

Date: 1st July 1958

Reference: N.S.L. 16018
MCN 12084

Checked by: [signature]

(N. A. Esserman)
Chief, Division of Metrology.

Note 1.—This Report states the results of measurements made, and is not a Certificate. A Report is furnished by the Laboratory where no definite conditions for the issue of a Certificate have been laid down: the standard of quality reached is then indicated by the results given in the Report.

2.—A Laboratory Certificate, Statement, or Report may not be published except in full, unless permission for the publication of an approved abstract has been obtained, in writing, from the Chief of Division.

N.S.L. 155C

National Physical Laboratory (see Previous Calibration above) the length of the interval 2 to 38 inch at a temperature of 20°C has been deduced from the value at the mean temperature of observation. This value was found to be

35.999 99 inch at 20°C

and is considered to be correct within ±0.000 02 inch.

In this Report lengths are quoted in a unit which is consistent with the relation

1m = 39.370 147 inch.

The work described in this Report was carried out during the month of June 1958.

———oOo———

Date: 1st July 1958

Reference: N.S.L. 16018
MCN 12084

Checked by: [signature]

(N.A. Esserman)
Chief Division of Metrology.

NATIONAL STANDARDS LABORATORY

N.S.L. 157C

Folio No. 14

COMMONWEALTH OF AUSTRALIA

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION

NATIONAL STANDARDS LABORATORY

REPORT

ON

A 40 INCH LINE STANDARD

For: Defence Standards Laboratories, P.O. Box 50, Ascot Vale, W.2., Vic.

Reference: Letter P5/401/1 dated 19th March, 1964.

Description: A 58% nickel steel bar having an H section and approximate dimensions 40.5 inch x 0.93 inch x 0.93 inch. The upper surface of the web is highly polished and is ruled throughout the range 0 to 40 inch in intervals of 0.05 inch and numbered 0, 1, ... 40 at the inch graduations.

Maker: Societe Genevoise, Geneve, Switzerland.

Marking: The scale is marked with the maker's name and "Acier Nickel 58%, 20°C, No. 3699, № 62637".

Previous Examinations: The results of previous examinations are contained in a National Physical Laboratory Certificate of Examination (Ref. M.L.23-47, M.16977) dated 10th December, 1947 and a National Standards Laboratory Report (Ref. NSL 16018, MCN 12084) dated 1st July, 1958.

/This .....

Reference: NSL 24286.
MCN 16830.

Checked by:

Date: 17th August, 1964.

for F. J. LEHANY
Chief, Division of Applied Physics

This scale has been calibrated at the National Standards Laboratory with the following results.

The measured departures from the nominal lengths of the intervals, referred to a temperature of 20°C, are given in Tables 1 and 2.

Preliminary examination showed that the pair of longitudinal lines on the scale were bowed by approximately 0.004 inch.

The scale was therefore positioned such that the longitudinal lines at the 2 inch and 38 inch graduations were symmetrically disposed about the centres of the fields of the microscopes; measurements were then made to the other graduation lines at the centre of the microscope field.

During the measurements the bar was supported horizontally on two symmetrically placed rollers 22.7 inches apart, at the positions indicated.

For the purpose of reducing the measured values at the temperature of observation to values at 20°C, the equation,

$$L_t = L_{20}\left\{1 + 0.000\ 011\ 251(t - 20) + 0.000\ 000\ 004\ 89(t - 20)^2\right\}$$

(where L_{20} is the length at 20°C and L_t the length at t°C) contained in National Physical Laboratory Certificate M.L.23-47, M.16977, was used.

In Tables 1 and 2, a positive departure indicates that the interval is oversize by the amount given.

/TABLE 1 .....

Reference NSL 24286.
MCN 16830.
Checked by: Date: 17th August, 1964.

NATIONAL STANDARDS LABORATORY

[illegible]

TABLE 1

Interval (inch)	Departure from Nominal Length (inch x 10⁻⁵)	Interval (inch)	Departure from Nominal Length (inch x 10⁻⁵)	Interval (inch)	Departure from Nominal Length (inch x 10⁻⁵)
2/2.05	+ 0.4	2/8	- 1.5	2/32	- 7.1
2/2.1	0.0	2/9	- 4.7	2/33	- 11.8
2/2.15	- 0.6	2/10	- 1.8	2/34	- 7.0
2/2.2	- 0.8	2/11	- 0.3	2/35	- 8.7
2/2.25	+ 0.4	2/12	- 2.7	2/36	- 12.9
2/2.3	+ 0.6	2/13	- 3.5	2/37	- 7.8
2/2.35	+ 0.4	2/14	- 5.3	2/37.05	- 9.1
2/2.4	+ 0.3	2/15	- 5.6	2/37.1	- 9.5
2/2.45	+ 0.3	2/16	- 4.3	2/37.15	- 10.8
2/2.5	+ 1.5	2/17	- 7.4	2/37.2	- 10.3
2/2.55	+ 1.5	2/18	- 4.2	2/37.25	- 11.2
2/2.6	0.0	2/19	- 3.3	2/37.3	- 9.9
2/2.65	+ 0.4	2/20	- 6.5	2/37.35	- 9.8
2/2.7	- 0.6	2/21	- 5.4	2/37.4	- 9.3
2/2.75	- 0.2	2/22	- 7.1	2/37.45	- 9.6
2/2.8	- 0.5	2/23	- 7.0	2/37.5	- 8.6
2/2.85	0.0	2/24	- 7.2	2/37.55	- 8.5
2/2.9	+ 0.2	2/25	- 8.8	2/37.6	- 9.3
2/2.95	- 0.3	2/26	- 6.5	2/37.65	- 9.0
2/3	+ 0.1	2/27	- 7.5	2/37.7	- 9.2
2/4	+ 0.8	2/28	- 10.6	2/37.75	- 10.6
2/5	+ 0.4	2/29	- 9.8	2/37.8	- 11.0
2/6	- 3.4	2/30	- 9.9	2/37.85	- 11.0
2/7	- 0.6	2/31	- 8.8	2/37.9	- 9.6
				2/37.95	- 10.0
				2/38	- 9.0

The values given in Table 1 are considered to be correct within ± 0.000 008 in.

/TABLE 2 .....

Reference NSL 24286.
MCN 16830.
Checked by: [illegible] Date: 17th August, 1964.

NATIONAL STANDARDS LABORATORY

TABLE 2

Interval (inch)	Departure from Nominal Length (inch x 10^{-5})	Interval (inch)	Departure from Nominal Length (inch x 10^{-5})
0/1	+ 3.7	38/39	- 0.2
0/2	+ 1.3	38/40	- 0.8

The values given in Table 2 are considered to be correct within ± 0.000 012 in.

The measurements on this scale were carried out in May, 1964.

NOTE: The values for the length measurements given in this report are in terms of the length of Prototype Metre No. 20.

-----0-----

Reference: NSL 24286.
MCN 16830.
Checked by:
Date: 17th August, 1964.

for F. J. LEHANY
Chief, Division of Applied Physics

NATIONAL STANDARDS LABORATORY

KELVIN'S CURRENT BALANCE

This apparatus was designed by Lord Kelvin in the 1880s to measure a.c. or d.c. current. Magnetic forces between four fixed and two moving coils carrying currents are balanced by gravitational force on the adjustable mass mounted on the beam. This gives the apparatus its name and allows it to essentially 'weigh' the current.

Following on from Weber's electrodynamometer, Lord Kelvin (Sir William Thomson 1824-1907) developed a method of measuring current (a.c. or d.c.) by balancing the electrodynamic force against the gravitational force. In other words the current balance literally "weighs" the current and hence the name.

The current balance consists of six coils four of which are arranged in two pairs and two are supported on a movable beam supported on a knife edge. The direction of the current (same in all coils) is arranged in such a manner that the forces on the two moving coils produce torque in the same direction. This torque by adjusting the position of a sliding weight mounted on the beam. Knowing the mass of the weight, its distance from the pivot and the gravitational acceleration gives the value of the torque produced by the current. This torque T and the value of the current I are related by

$$T = \alpha I^2$$

where α is a constant which can be calculated from known physical constants and the dimensions of the coils and the beam.

Because this method of measurement determines the current in terms of the fundamental units of length, mass and time, it is a so-called 'absolute' method of measuring current. Two such instruments were set-up as the standards in Britain in 1894 and achieved an accuracy of 0.2%.

The same principle for measurement of current with slight modification of construction is used in all modern national standards laboratories (e.g. The National Measurements Laboratory in Sydney). The modern Balance is capable of measuring currents with uncertainties of only a few parts per million.

KELVIN'S MOVING-IRON AMMETER

Lord Kelvin (Sir William Thomson 1924-1907) is well known for his fundamental contributions to the fields of mechanics, thermodynamics, hydrodynamics and electricity.

Between the years of 1881 and 1896 he designed, patented and marketed a large number of electrical instruments of which the ammeter (he preferred the name amperemeter) shown here is an example.

In this moving iron instrument a soft-iron needle is attracted upwards in the coil formed by 3 turns of the thick copper strap. The vertical motion of the iron is converted to rotary deflection of the pointer. Damping is provided by a piston moving in a dashpot filled with oil.

N° 18,035A A.D. 1888

Date of Application, 11th Dec., 1888
Complete Specification Left, 7th Sept., 1889—Accepted, 30th Nov., 1889

PROVISIONAL SPECIFICATION.

An Improved Amperè Gauge and Connections.

I, Sir William Thomson, Knight, of Glasgow College, Doctor of Laws and Professor of Natural Philosophy in the University and College of Glasgow, in the County of Lanark, North Britain do hereby declare the nature of this invention to be as follows :—

For an inspectional ampere gauge the current to be measured is so dealt with in a vertical solenoid, that it pulls in one direction, preferably upwards, a thin bar or needle of soft iron hanging vertically from a spring or from one arm of a counterpoised balance. The amount of the current is indicated by an index upon a scale. This index is deflected through angles varying according to the extent to which the needle is attracted into the solenoid. A solenoid of any known construction may be used. The solenoid which I prefer is of special construction consisting of a series of flat plates divided and bent at the centre, and united so as to form a solenoid. A current through this solenoid produces a strong magnetic force in its hollow interior field of which the transverse section is of small diameter and may be of circular or elongated shape.

The improvements also include a spring clip for throwing any part of the apparatus into or out of the circuit in which it is to be used without disturbing other apparatus in the circuit.

The improved clip consists of an arrangement by which two conductors, both of which may be elastic, preferably a number of elastic plates, or one elastic and one rigid, meet at an angle which may be acute or obtuse or zero, and are pressed by screw or otherwise elastically but firmly against each other. The constituent parts of the elastic portion of the clip may be insulated from each other and connected through resistances to a single conductor when it is desired to gradually introduce resistance before breaking the circuit. The circuit is broken or extended by a plate-piece which consists either of a flat-piece of slate or other insulating material, or of a couple of flat pieces of metal each connected to a flexible electrode but insulated from one another by slate or other insulated material and firmly bolted together. The first mentioned plate-piece is used to break the circuit, the second to extend the circuit by inserting another circuit.

Dated this 10th day of December 1888.

BOTTOMLEY & LIDDLE,
115, St. Vincent Street, Glasgow, Petitioner's Agents.

EARLY DIRECT CURRENT GENERATOR

This belt driven direct current generator (or dynamo as then known) was built around 1880. The machine has a Gramme-ring armature (invented by Z.T. Gramme in 1870) and the copper braid used for current collection at the commutator surface is the origin of the term brush. The field winding is shunt connected.

The Gramme-ring winding which is difficult to assemble is also inefficient in that only half the conductors are active. Slotted armature windings overcome these problems and have long since superseded the Gramme-ring in all direct current machinery. The generator was given to Monash University by the Physiology Department, Melbourne University.

SULLIVAN TELEGRAPH RECEIVER

– for unattended operation

Thought to have been manufactured around 1890, this instrument has a clockwork drive for the paper tape.

On receiving an electrical pulse, the solenoid pulls in. This trips the clockwork, which then suns for about five seconds, If further pulses are received (corresponding to the dots and dashes of a Morse code message), the timing interval is restarted. Thus, the clockwork runs and advances the tape throughout any message and then for a further five seconds to separate one message from the next.

Printing on the tape is via a small wheel which dips into a tank of ink. The solenoid raises the wheel so that it touches the tape for the duration of an electrical pulse.

CORE MEMORY FOR BURROUGHS 5500 DIGITAL COMPUTER

The core stack shown is organized for 4096 works, 48 bits (plus I parity) per word. Thus it contains $4096 \times 49 = 200704$ ferrite magnetic core elements, each in the shape of a tiny doughnut. Each element holds one “bit” of information, a “1” for one direction of polarization and a “0” for the other. Electronic drive circuits at the ends of the stack are used to “address” any word of memory in a “random access” fashion; and either “read” information out of the stack, or “write” new information in. The core cycle time is four microseconds. That is, 250,000 operations per second are possible.

Core memory was most widely used as computer main memory in the sixties and seventies. In the early years the four sets of wiring which had to pass through each core were threaded by hand. In later years the process was automated. Core memory has been superseded by purely electronic circuits, which are cheaper and faster.

**HONOURS PROJECT DESIGNED AND CONSTRUCTED
BY A FOURTH YEAR ELECTRICAL ENGINEERING STUDENT**

This electronic assembly was designed by a fourth year student to enable fast and accurate measurements to be made of shaft and slip of electric motors. Slip is an important parameter determining the capability of some electric motors.

The small unit alongside was developed by technical staff in the department from the prototype design, constructed in the department's electronic workshop and is one of several units made for use in the departmental power laboratory.

The units operate using both analogue and digital electronics and the principle of feedback to obtain a high level of accuracy. The feedback action causes the peed and slip readouts to constantly adjust until they match exactly the speed and slip of the motor's rotating shaft.

One of the salient features of the design is the simplicity of measurement by use of an optical transducer which provides complete electrical and mechanical isolation from the motor's operation. The emit a beam of light onto the motor's shaft and, by virtue of a single reflecting mark arbitrarily positioned on the shaft, information is sent to the unit from which is derived speed and slip. The reference for al measurements is mains frequency – 50 Hertz.

The unit's specifications are as follows:

Speed range	:	50 to 9000 R.P.M.	Accuracy	:	±1 R.P.M.
Slip range	:	1.000 to –1.500	Accuracy	:	±0.001

Range of application:

For speed and slip	:	A.C. machines with 2 to 12 poles
For speed only	:	Any rotating shaft.

AMPHION AR 19 DRAGON

MANUFACTURER: Alfred Graham & Co. Britain

YEAR:

PRICE: £ 5-5-0

OPERATING PRINCIPLE: Electromagnet-diaphram

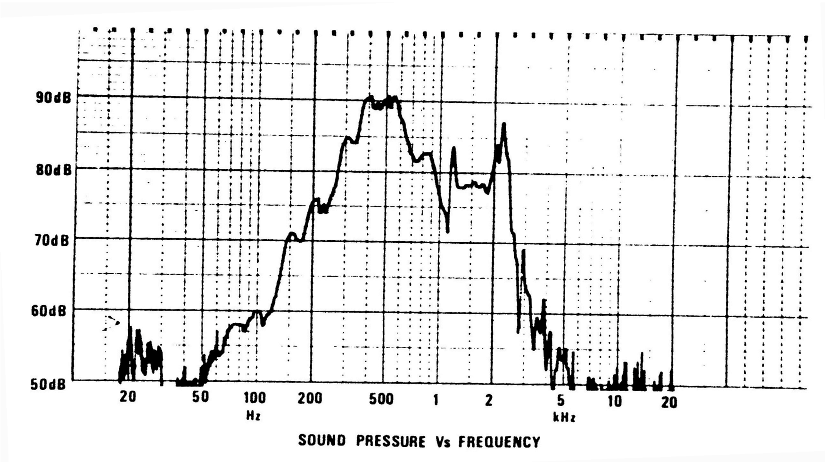
IMPEDANCE: DC 2,200 ohms

1KHz 17,770 ohms

COMMENTS

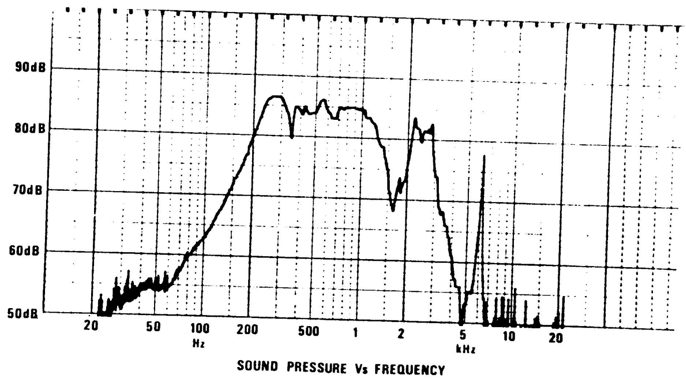
A floating diaphram of Stalloy is supported each side by a rubber insulated metal ring along the diaphram's plane circumference.

An adjustment of the relative positions of the magnet surfaces and the diaphram surface is provided.



R.C.A. 103

MANUFACTURER:	Radio Corporation of America
YEAR:	1927
PRICE:	$35
OPERATING PRINCIPLE:	Moving-Armature
IMPEDANCE:	DC 1,450 ohms
	1 KHz 11,430 ohms



NIGHTINGALE BULLPHONE

MANUFACTURER: W. Bullen, Hoywell Lane, London

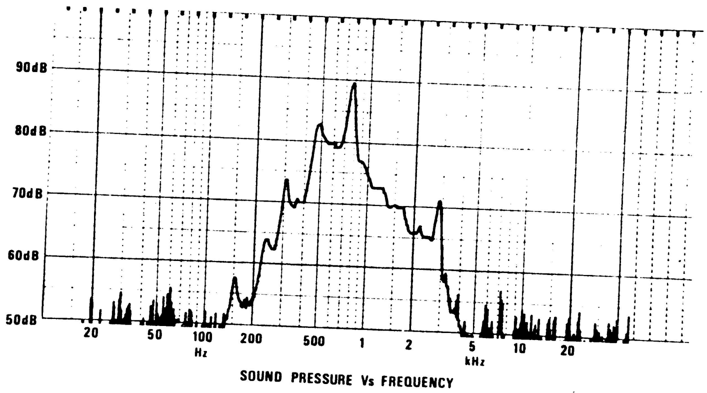
YEAR:

PRICE:

OPERATING PRINCIPLE: Electromagnet-diaphram

IMPEDANCE: DC 3,200 ohms

1KHz 19,470 ohms

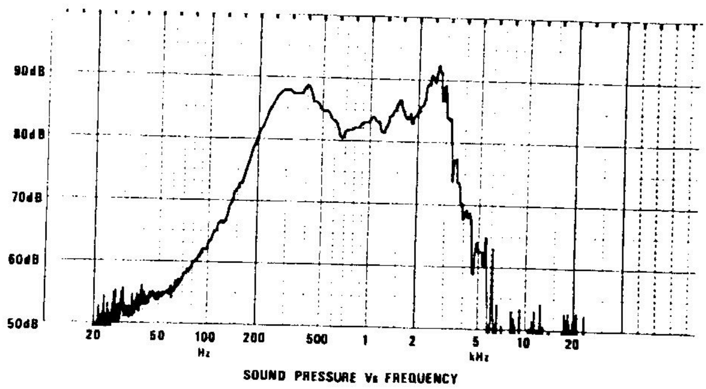


R.C.A. 100-A

MANUFACTURER:	Radio Corporation of America	
YEAR:	1926	
PRICE:	$30	
OPERATING PRINCIPLE:	Moving-armature	
IMPEDANCE:	DC	1,300 ohms
	1KHz	10,470 ohms

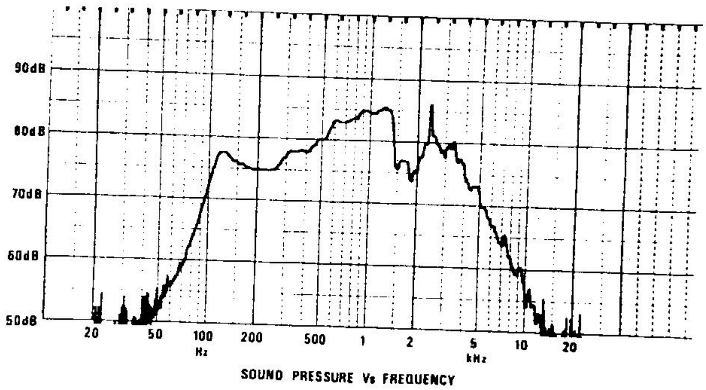
COMMENTS

Sold in 1928 by Australian General Electric and Hartleys for £10-10-0



ROLA

MANUFACTURER:	Rola Company (Aust.) Pty. Ltd. Victoria
YEAR:	
PRICE:	
OPERATING PRINCIPLE:	Moving-coil
IMPEDANCE:	DC 325 ohms
	1 KHz 13,170 ohms

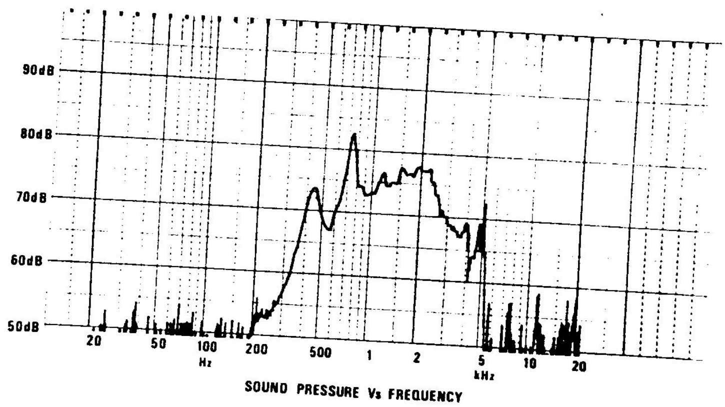


BROWN H4

MANUFACTURER:	S.G. Brown Ltd., London
YEAR:	1926
PRICE:	30 –
OPERATING PRINCIPLE:	Reed-driven cone
IMPEDANCE:	DC 2,100 ohms
	1KHz 10,470 ohms

COMMENTS

Tone control varies the relationship between the tuned-reed and the pole faces.

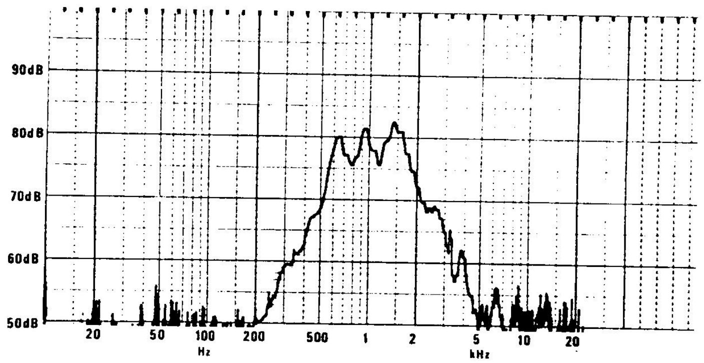


BROWN H2

MANUFACTURER:	S.G. Brown Ltd. London
YEAR:	1926
PRICE:	£ 2-5-0
OPERATING PRINCIPLE:	Reed-driven cone
IMPEDANCE:	DC 2,100 ohms
	1KHz 9,795 ohms

COMMENTS

Note tone control.



SOUND PRESSURE Vs FREQUENCY

AMPHION DYNAMIC

MANUFACTURER:

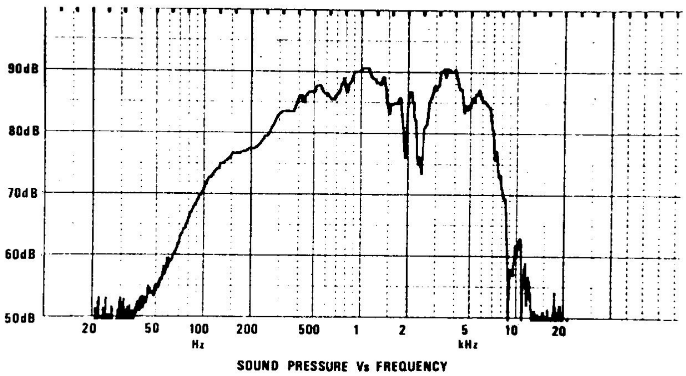
YEAR:

PRICE:

OPERATING PRINCIPLE: Moving-Coil

IMPEDANCE: DC 850 ohms 1KHz 9,160 ohms

1 KHz 9,160 ohms



IDEAL BLUE-SPOT

MANUFACTURER:

YEAR:

PRICE:

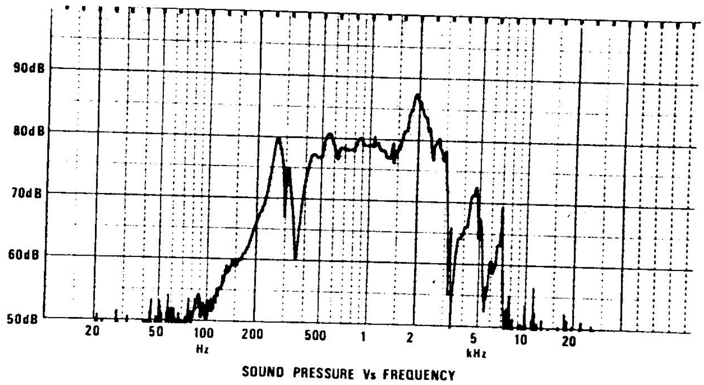
OPERATING PRINCIPLE: Moving-armature

IMPEDANCE: DC 900 ohms

1 KHz 5,510 ohms

COMMENTS

Note volume control.



YEAR:

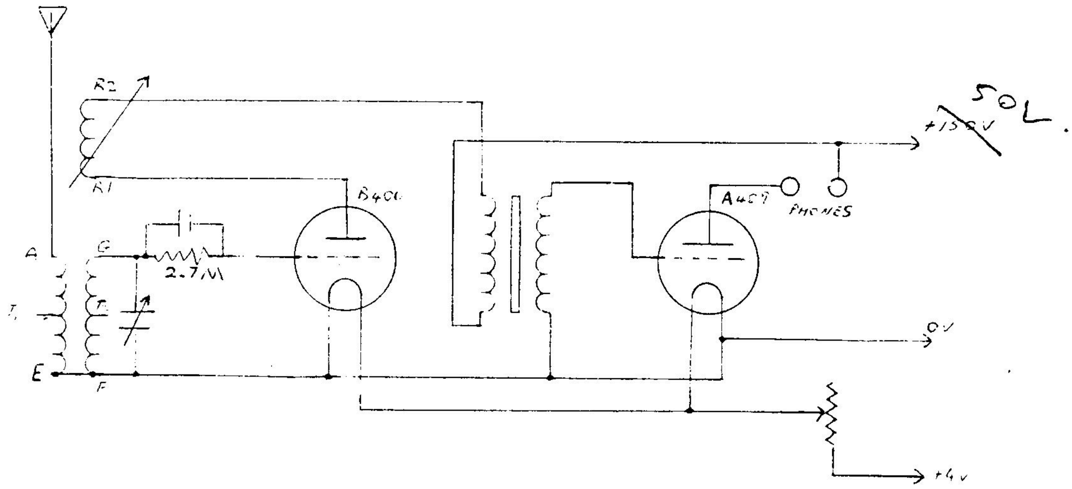
PRICE:

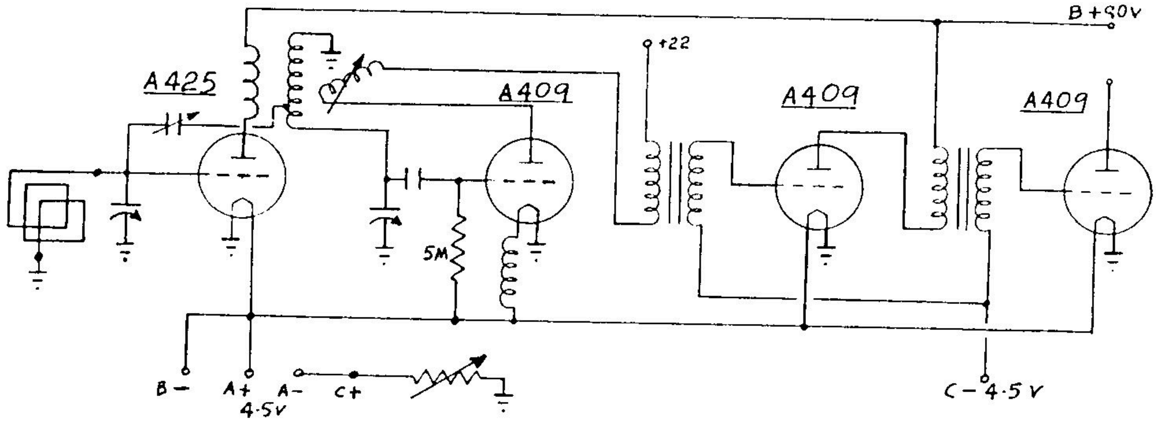
POWER SOURCE: 4 V "A" BATTERY 50 V "B" BATTERY

VALVES 2: 1 OFF B406, 1 OFF B409

MANUFACTURER: 1 KHz 5,510 ohms

COMMENTS





SILVERTONE

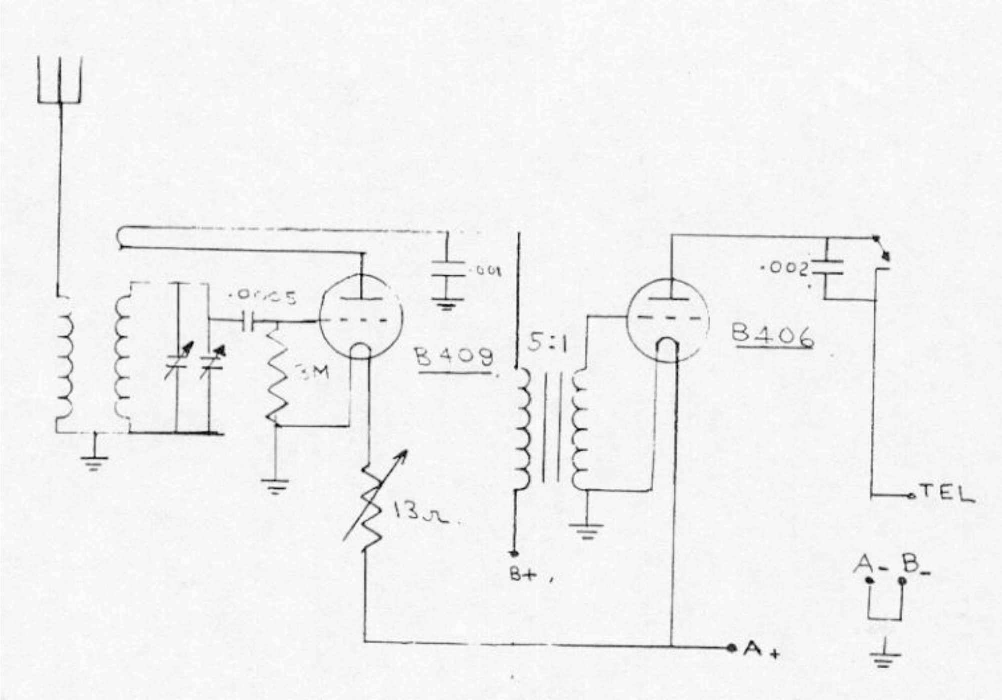
(1)

YEAR:

PRICE:

POWER SOURCE:	"A BATTERY	"B" BATTERY
VALVES 2:	1 OFF B409,	1 OFF B406
MANUFACTURER:	____________________________________	

COMMENTS



(2)

YEAR:

PRICE:

POWER SOURCE:	4 V “A” BATTERY	30 V “B” BATTERY
VALVES 3:	1 OFF D1,	2 OFF E
MANUFACTURER:	________________________	

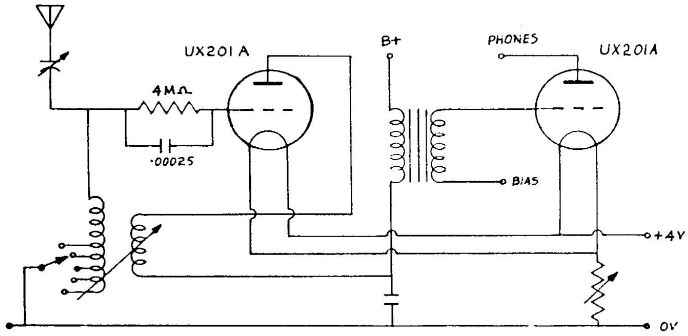
COMMENTS

Circuit diagram stock inside case.

CROSLEY 51

YEAR:	1924
PRICE:	$47.50 (INCLUDING SEPARATE AUDIO AMPLIFIER)
POWER SOURCE:	4 VA 45 VB 4 VC
VALVES 2:	2 OFF UX201A
MANUFACTURER:	CROSLEY RADIO CORP., CINCINNATI, OHIO U.S.A.

COMMENTS



CROSLEY 51

1924

MONARCH BABY

YEAR:	1939-40
PRICE:	
POWER SOURCE:	240 V A.C.
VALVES 2:	I OFF 12B8GT, 1 OFF 23L7GT
MANUFACTURER:	ECLIPSE RADIO PTY LTD., SOUTH MELBOURNE

COMMENTS

CIRCUIT INDENTICAL TO ASTOR A.R. BABY

? YOUR ACCUMULATOR AT HOME
WITH A

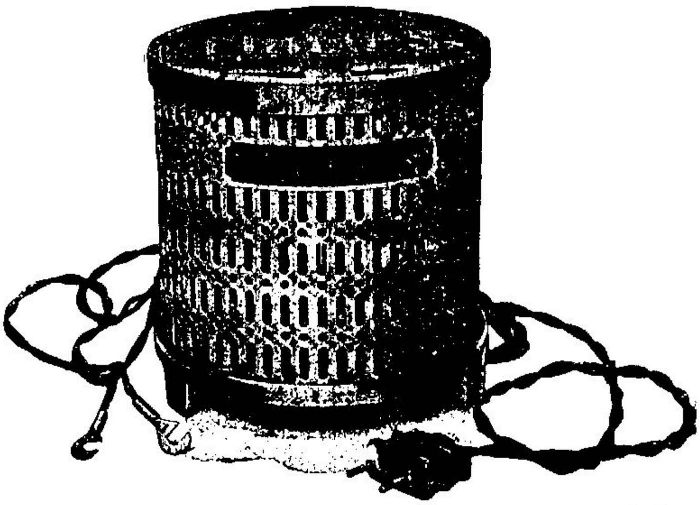
PHILIPS-RECTIFIER

For charging batteries off an alternating current the PHILIPS-RECTIFIER is the ideal medium it is efficient, entirely automatic, noiseless and above all moderately priced.

The use of the RECTIFIER is simplicity itself a child can operate it. The only thing to do is to plug it into an ordinary receptacle and connect the RECTIFIER LEADS to your battery. No further attention is required.

When the battery is discharged merely connect up as described above and your battery is charged automatically during the night and ready for use the following day. No risk of the battery running down in the middle of a programme no troublesome and annoying carrying of your battery to the Local Charging Station with a PHILIPS-RECTIFIER it is always ready for use.

The RECTIFIER will charge 1 to 6 cells with a current consumption of 50 to 55 watts at a charging current of 1.3 Amp.



Made by N.V. PHILIPS' RADIO.
Ask your Local Electrical Store for further particula.,.

852 E.

INV No. 214

GLASS PLATE MACHINE

A generator of static electricity.

This machine is very similar in construction to the machine build by Dr Inganhousz 1746 and by Jesse Ramsden in 1768.

Age of exhibited machine unknown.

INV No. 215

UNIVERSAL DISCHARGER

An instrument for discharging Leyden Jars and electro-static generators.

Age of exhibit unknown.

INV No. 216

CLAMP FOR PUNCTURING CARDS WITH AN ELECTRIC SPARK

This clamp is one of a number of implements used in the 18^{th} century to further the understanding of electricity.

Age of Exhibit unknown.

GOLD LEAF ELECTROSCOPE

Since the earliest observations of electrical phenomena Investigators used electroscopes for the detection of static electricity. Van Goericlec used as early as 1660, two downs of a Duck, Benjamin Franklin and Stephen Gray used parallel hanging strings. The origin of the Pithball electroscope is not known but it too appeared in the early 18th century. The Reverend Abraham Bennet invented in 1787 the Goldleaf Electroscope which is far more sensitive than the aforementioned devices. He described his invention in the Philosophical Transaction of the same year.

Age of exhibit unknown.

INV No. 218

CROOKES TUBE

A device to study conduction through a space containing an air pressure of about 1 to 10 mm Hg.

The first vacuum tube of the Crookes variety was constructed by Michael Faraday in 1838.

Age of exhibited tube unknown.

INV No. 219

INSULATED STAND

An implement used in conjunction with Leyden Jars.

INV No. 220

PART OF CARBON ARC LAMP

Sir Humphrey Day demonstrated that Carbon Arc Light in 1810, using his 2000 cell battery.

Carbon Arc Lamps became very popular with the invention of generators, particularly centralized generation coupled with broad distribution systems. This was around 1875 to 1890.

The types of Carbon Arc Lamps vary from manually adjustable to clockwork controlled to feedback controlled to feedback controlled, as in the Differential Lamp. This exhibit is a manually adjustable type.

Age of exhibit unknown.

INV No. 221
222

HANDLE OF UNIVERSAL DISCHARGER

LEYDEN JARS

INV No. 223
229

In the year 1745 the possibility of storing electrical charges was discovered by the Decan von Keist in Cammin and again a few weeks later by Cuneus, a pupil of the philosopher Muxhenbroek in Leyden.

Cuneus in reporting his discovery to Reaumur used the following words in his summing up. “It took me two days to recover” and “For the Crown of France I would not expose myself for a second shock”.

The first jars were filled with iron filings and water respectively, but metallic linings or inserts become universally used in the Leyden jar. Special effects were obtained in the jar with the diamond shaped lining where small sparks appear between the diamonds during discharge.

Age of exhibits unknown.

INV No. 026
229

GALVANOMETER

This instrument was built in 1903-4. It consists of a tangent galvanometer and 6 Zinc-carbon cells. The cells are switched into the circuit by a 7 position switch.

INV No. 027

RUHMKROFF COIL

AN INDUCTION COIL

The first induction coil was built in the months September to November 1831 by Michael Faraday. The purpose of this coil was to transfer electrical energy from one coil to the other. In 1836 the American researcher Page built and induction coil in which the secondary voltage became higher than the primary voltage. Page's invention never gained acceptance. In 1848 Ruhmkroff, a mechanic in Paris, built his induction coil which had a very good reputation and became well known. For about 30 years this coil was used solely as a scientific instrument and in 1878 Jablochkoff used the coil for the first time in a practical application in conjunction with this electric lamp.

The exhibited coil was built 1910 in Melbourne.

INV No. 235

VOLTA METER

An apparatus to decompose water first presented and demonstrated by Alessandro Volta November 1800 during a lecture in Paris.

Age of exhibited apparatus unknown.