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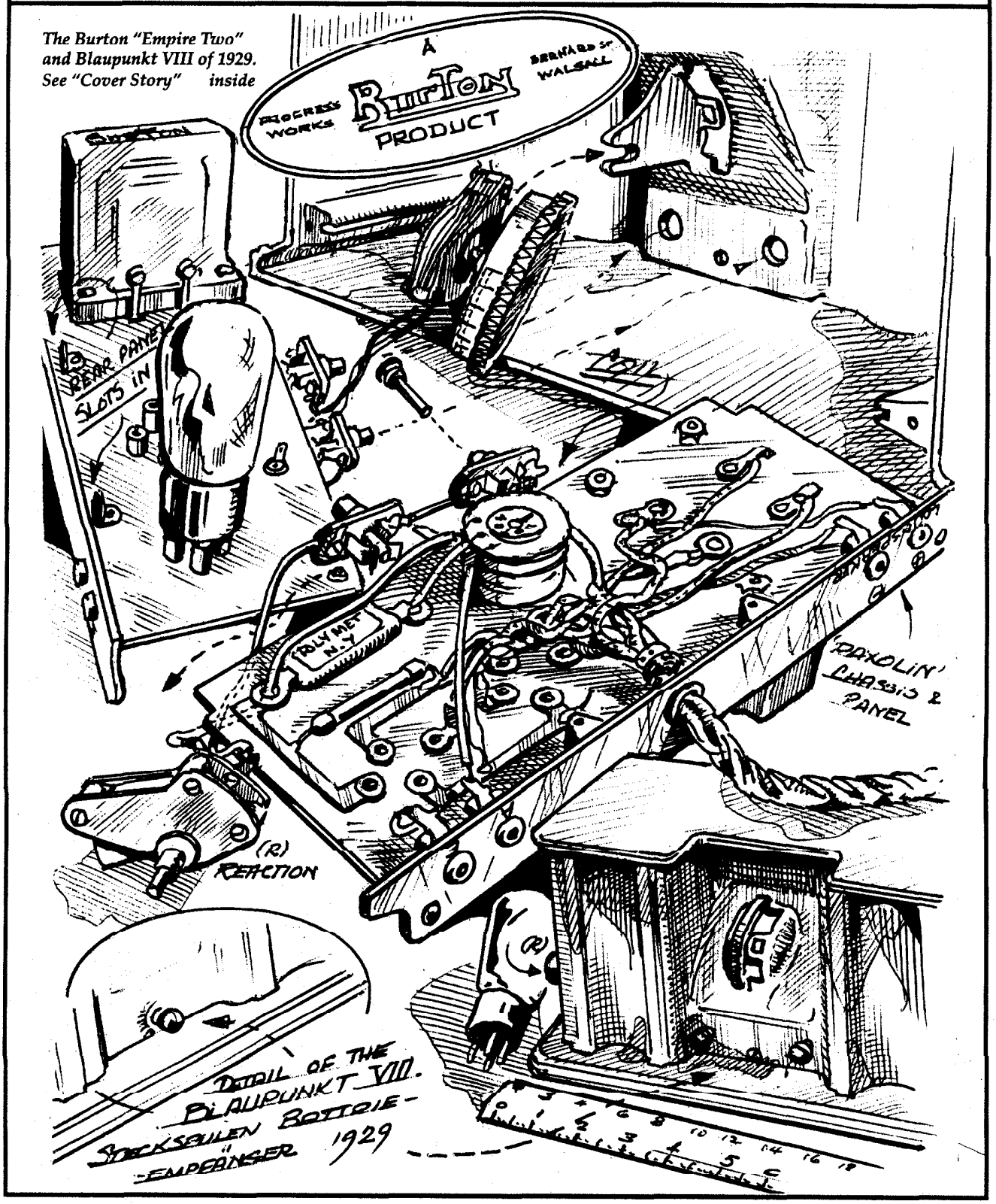
BULLETIN OF THE BRITISH

VINTAGE WIRELESS

SOCIETY

The Burton "Empire Two" and Blaupunkt VIII of 1929. See "Cover Story" inside



BULLETIN OF THE BRITISH
VINTAGE WIRELESS SOCIETY

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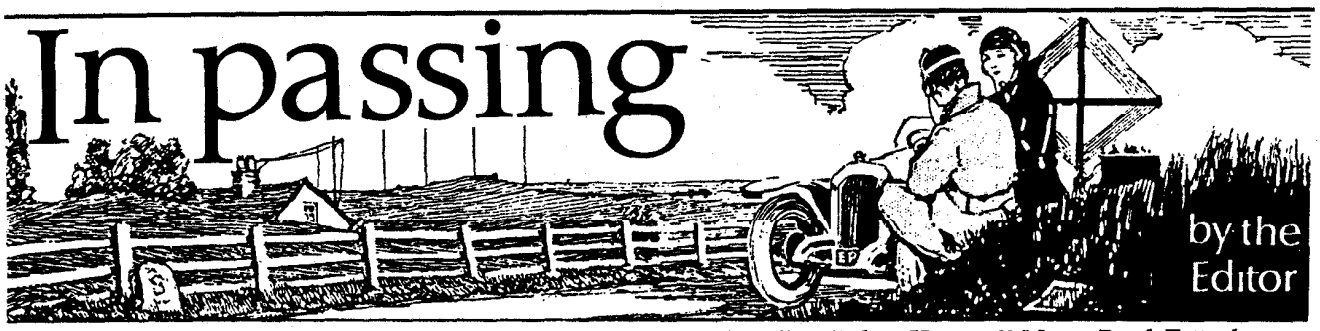
VINTAGE WIRELESS MUSEUM

The Vintage Wireless Museum, headquarters address for the British Vintage Wireless Society is at 23 Rosendale Road, West Dulwich, London SE21 8DS. Telephone: (081) 670 3667. The Curator is Gerald Wells, whom visitors should telephone before visiting the museum.

In passing



by the Editor

Correspondence for the Society's Bulletin should be addressed to The Editor, Robert Hawes, 63 Manor Road, Tottenham, London N17 0JH. Telephone: (081) 808 2838.

Faraday lecture

The 1991/92 IEE Faraday Lecture, co-presented by Philips Electronics and Imperial College, which was launched at the Brighton Dome earlier this month, is expected to be seen by an audience of more than 85,000 during its six month tour of the UK.

Entitled 'Years Ahead' the one hour presentation looks at the development of some of today's hi-technology products such as television sets, computers, audio systems and compact discs and traces their origins back to the work of Michael Faraday – the nineteenth century scientist who became known as the 'father' of electrical engineering. The Lecture also provides a glimpse of the future by predicting how these technologies might develop in the 21st Century.

The lecture programme includes stage demonstrations and film re-enactments of some of Faraday's key experiments of the 1830's and 1840's

The Faraday Lecture was inaugurated by the Institution of Electrical Engineers in 1924 to promote public interest in Electrical Engineering and to commemorate the life and work of Michael Faraday. In 1991, the bicentenary of Faraday's birth, the aims of the Lecture remain the same.

The lecture will be given in a number of major British towns and the series continues until March 1992.

For further information contact: The Faraday Officer, IEE, Michael Faraday House, Six Hills Way, Stevenage, Hertfordshire SG1 2AY.

Society member Gordon Bussey, who is a member of the Organising Committee, is also able to give information.

Reminder

Members are reminded that the annual subscription is due on 1st January 1992 for all members irrespective of original individual joining dates. It would greatly help the Treasurer if payment could be made promptly – even in advance!

BVWS on the air

In recent years it has become customary for radio amateurs with common interests to meet `over-the-air` at pre-arranged times. These groups, or nets as they are known, include bee keepers, Probus supporters, Rotarians, and members of amateur radio societies connected with the Services.

Ray Herbert G2KU, wishes to inaugurate a BVWS net and suggests the first Monday of each month at 0915 on the nearest clear channel to 3640kHz. There is considerable congestion over the weekends so, Monday has been chosen in the belief that most BVWS members with transmitting licences are retired. It is proposed to make a start on Monday 2nd December.

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Cover story

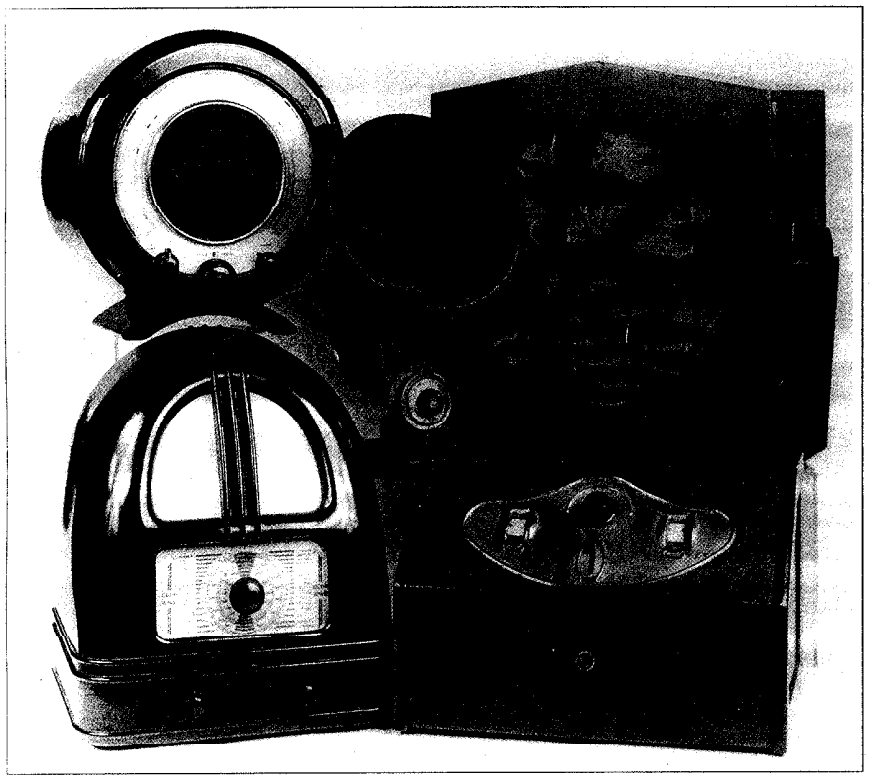
Norman Jackson's drawing on the front cover shows the British Burton "Empire Two" receiver of 1929 which appears to be almost identical to the German "Blaupunkt V111". A two-valve battery set, it has unremarkable circuitry but the technique of construction and cabinet design were innovative. The majority of radio cabinets of the day were of wood but this set is made from bakelite; it is likely that the cabinet for the British set was made in the German Blaupunkt works and imported by Burtons of Walsall, who assembled the set using British components, for there was probably no bakelite plant in Britain at that time which would have been capable of producing such a cabinet. Fitting very precisely into the bottom of the cabinet is a specially shaped chassis made from a "Paxolin" type material on which components are linked together with stamped-out shaped brass plates - a precursor of printed circuitry.

Museums

The curators of two major old established wireless museums, both established by Society members many years ago, have asked us to point out that they have no connection with the reported establishment of a "National Vintage Wireless and Television Museum", which an article in the Press recently stated was to be set up in an old lighthouse in Essex.

The two UK wireless museums which have names that might be confused with that of the newly reported one are: *The Vintage Wireless Museum* at Dulwich which was founded by its director Gerald Wells; and the *National Wireless Museum* at Arreton Manor on the Isle of Wight which was founded by its curator Douglas Byrne.

In Passing, news, comment



Saleroom news

A collection of over two hundred Radios, dating from 1924 to the late 1950's, will be auctioned as part of a Collectors Sale on Thursday 7th November at 11.00am at Bonhams, Chelsea.

From a 1920's Majestic American Radiogram and a 1930's "Tree" Ekco to a 1950's Telefunken Set, they came from a firm which hired them out as stage "props". Sets include ones used in films and television series such as Jeeves and Wooster, Buster, Absolute Beginners, The Krays, Empire of the Sun, Plenty, Hope and Glory and Private Function.

Details can be had by ringing 071-351 7111.

Christie's South Kensington, also feature interesting items at their sale on 5th December at 2pm including a Baird Televisor radio gramophone of about 1932-3 and a collection of pre-war radios.

Details from Christopher Proudfoot on 071-321 3277.

News from Scotland

Each weekend since, Easter, a steady stream of visitors, from all corners of the globe, have been captivated by "Words, Music and Morse", the Museum of Communication's exhibition in Bo'ness (18 miles west of Edinburgh).

This lively and imaginative "hands on" experience covers all aspects of communication including radio, telephone, telegraph, teleprinting, braille, typewriting and printing.

The exhibition, which has just closed, is the latest in a series intended to give the public an idea of what to expect when the former Hippodrome Cinema (now undergoing restoration) eventually opens its doors to the collection.

The owner and curator of the vast 25-ton collection is Society member Harry Matthews, who began his collection many years ago at Edinburgh University. To assist him in his endless task of restoring and preserving, a specialist support group, the "Scottish Museum of Communication Foundation" is to be established and will hold its inaugural meeting in Edinburgh in January 1992.

Like the Museum it supports, its aim will be the study, restoration, collection and exhibition of communications and information technology. For details of the collection and the support group, contact C.H.C. Matthews, 22 Kinglass Avenue, Bo'ness, W. Lothian. (Phone: 0506-824507).

Restoration Tips

Readers are invited to contribute to this feature. Please send your tips to Geoffrey Dixon-Nuttall, our technical correspondent, at Longmeadow, Miles Lane, Cobham, Surrey, KT11 2EA.

No 4 Sticky slugs: The slugs which tune I.F. transformers often stick and break. I know of no way to remove these satisfactorily-drilling them out is *very* risky! It is better to remove all the loose bits of slug and then add a trimmer. If the slug is in the grid circuit of a Philips set it is impossible to get access to the tuned circuit without dismantling the transformer, but it is possible to fit a small trimmer inside the top cap of the valve, from grid to earth. This is in series with the A.V.C. decoupling capacitor, but this does not usually matter. The tiny Mullard trimmers do the job nicely.

No 5 Tricky trimmers: Those horrible Philips wirewound trimmers can be re-used by adding a small capacitor of about 10pF and starting all over again. It is *not* possible to re-wind them!

No 6 Ripped cones: Quite bad tears in speaker cones can be mended with Copydex.

No 7 Valve bases and tops: Valves which are loose on their bases can be stuck very successfully with superglue. This is also good for loose top caps.

Looking back . . .

Roger Snelling

From Wireless World
Mar. 9th 1932:

"Where are the oscillators"

Only 6,910 letters of complaint regarding local oscillation reached the B.B.C. during 1931, as compared with 7,023 in 1930.

This is not a big drop, but it is significant of the fact that oscillators are a slowly dying race. I hold no brief for the squealers, but there is always something sad in the decline of a popular movement. Steps might be taken to ensure the survival of a few specimens, perhaps by the founding of a national reservation similar to those which accommodate the Red Indians in America. The few remaining squealers and squaws could then re-radiate to their heart's content.

Inventor Extraordinaire:

David Edward Hughes FRS

by Ralph Barrett

In his lifetime, David Hughes was known as a successful inventor and businessman, who became a telegraph engineer, and rose to the top of his profession.

He was a genial companion and met three times a week for dining at the Horseshoe Hotel in Tottenham Court Road. He had lots of information and stories and appreciated fun.

Today he is remembered as the inventor of the microphone and as a claimant to the title "discoverer of radio waves".

Marconi came to England in 1896, but 20 years earlier, before resonant circuits, carrier waves, and modulation, David Hughes was wandering up and down Great Portland Street in London with a Bell telephone to his ear, listening to the world's first radio signal.

The year is 1879, a horse drawn music hall world, the stage lit by candles, oil-lamps or gas flames, Swan had just invented the electric lamp.

David Hughes was an enthusiast and was one of the brilliant discoverers and inventors of the 19th century. He worked with the enthusiasm which seemed to characterise scientists of the period.

Hughes was an anglo-american inventor, born in London; his mother and father emigrated to Virginia in 1837, the year of Victoria's coronation, when David was seven. His parents were of the family of boot and shoe makers of London and Bala, in Marioneth.

He had a marked talent for music, which showed at an early age, probably inherited from his father. By the age of 19 he was Professor of Music at the Bardstown College in Kentucky.

His other great interest was science, and two years later, he was teaching natural philosophy as well, until the electric telegraph called into play his faculty for invention.

At this time in the U.S.A., line telegraphy with hand keying of morse code was thriving for telegrams. There were also some printers, forerunners of the teleprinter, which would do away with the learning of morse. One of the first was by Mr. House, in America. It used several electrical pulses to set up each letter, and at the receiver the pulses moved a type wheel. This was slow and the several pulses became distorted on long lines.

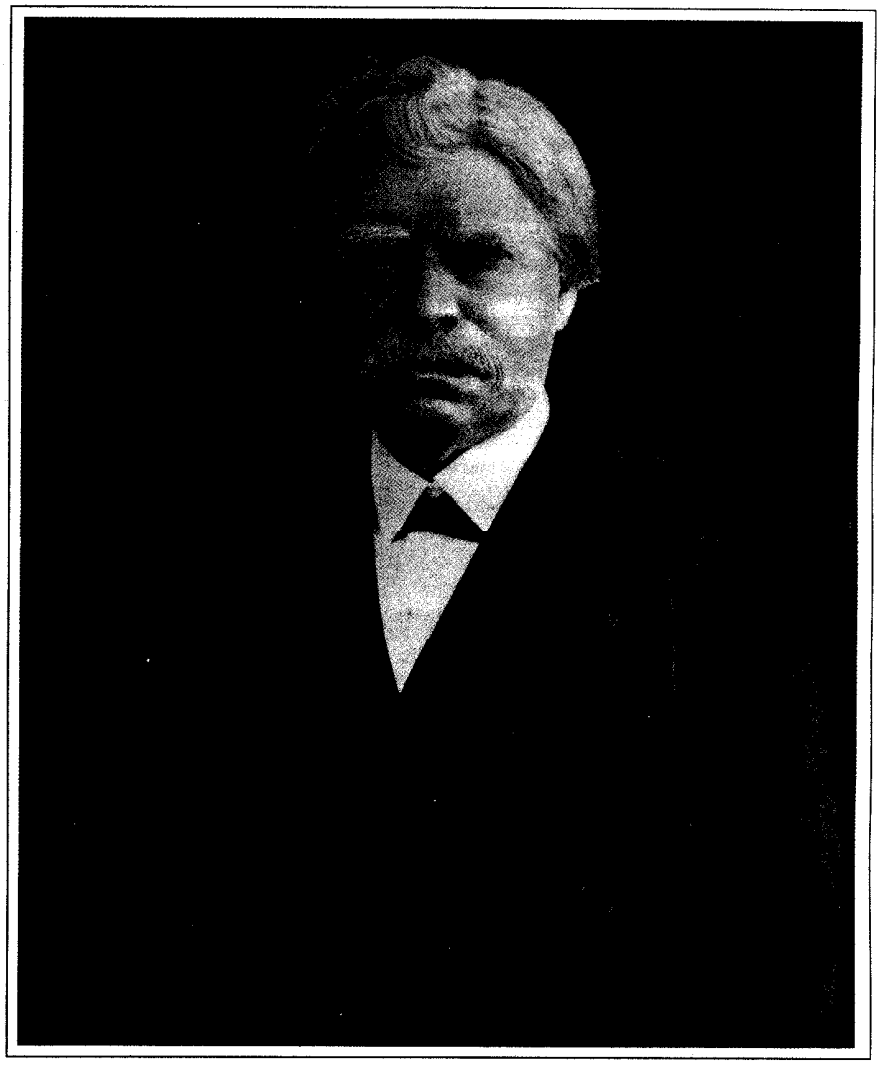


Fig. 1 David Edward Hughes FRS

Hughes' printer had a continuously moving type wheel and a single pulse for each letter, the pulse being sent at the precise moment, when the letter came under the hammer, so to speak. It was fast, and, then as now, time is money.

Such an arrangement required synchronism at the receiver with the sending wheel. At the sending end, contact points, actuated by the letter keyboard, were struck by letter pins of the sending wheel, a pulse was sent and the key released. The synchronism of the clockwork drive was a mechanical governor and a tuned vibrating spring, at the transmitter and the receiver. The vibrating springs were set each morning with a tuning fork so they made the same musical note, an idea owed to his musical training.

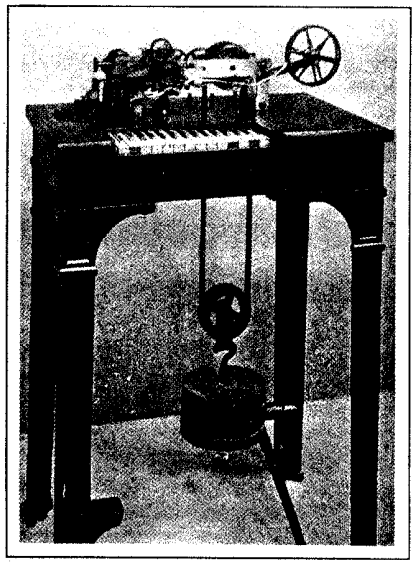


Fig.2 The Hughes telegraph with weight driving the clockwork. Note the black and white sending keys, after the style of a piano. (Before the typewriter invention of buttons). Note the paper tape and reel for receiving.

Historical

• from previous page

Our man returned to Great Britain in 1857. He had been away 20 years and was now 27. The printer was sold to the French Post Office, and it was gradually adopted by telegraph companies all over Europe. Eventually there were about 4000 in use; he had made his fortune.

Hughes became a leading telegraph engineer; although well-off at the age of 47, he could be found in his modest residence in Great Portland Street, where he pursued experimental science in the manner of a true philosopher. In his rooms he had batteries made of gallipots, lamp chimneys, sheet zinc and pipe clay, home made apparatus, constructed from match boxes, pill boxes, needles, copper wire and sealing wax.

Hughes' move to London gave him access to a multitude of scientific societies. The centre was Europe, around the three capitals, Berlin, London and Paris, whereas America was then on the fringe of the scientific world.

Hughes now wanted to look into the world of pure science; he judged that the telephone transmitter – the mouth piece – needed attention. There was enormous public interest in the telephone, being probably equalled only by the sensation made in 1896 by Röntgen's discovery of X-Rays.

Graham Bell's telephone in 1876 was not good; it made use of electromagnetic induction, a moving iron diaphragm in front of a coil of wire. The electrical energy was derived only from the power of the voice and could not travel far.

Hughes speculated that the resistance of wire to electricity varied with sound, in the same manner as selenium with light. Light, heat and strain, can vary resistance; sound creates strain – perhaps sound could vary resistance? He experimented with a stretched wire and a telephone earpiece; the wire was "spoken to" and plucked. No sound came from his earpiece, but there was always a sound when the wire broke. Soon he had isolated the circumstances of contact as the only requirement for the detection of sound. This led to the epoch-making microphone: the 3 nails in "H" formation, the cross bar completing a loose contact. The year was 1878. This imperfect contact, the resistance of which varied when spoken to, would convert energy from a battery producing a strong electrical output. Because of its sensitivity Hughes named the instrument "microphone". He said it would do for sound what the microscope had done for vision. He reported, "With a fly put under a table glass it gave a peculiar tramp of its own".

Fig. 3 An international telegraph office showing the operational format of the Hughes telegraph . . .

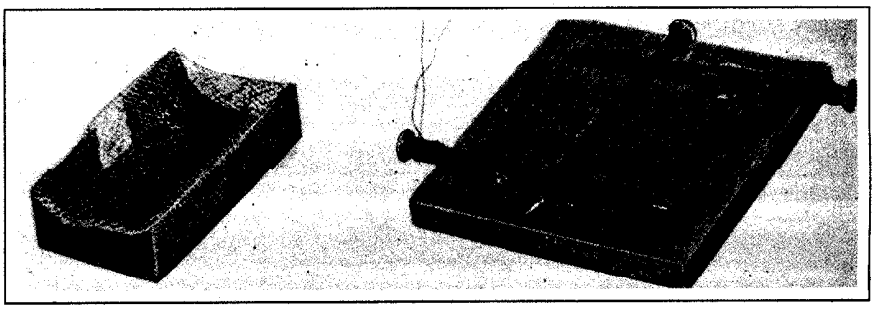


Fig. 4 The "H" microphone, three nails in loose contact "surface contact variation in exact proportion to sonorous waves"; matchbox for demonstration with insects; and carbon-rod microphone.

Hughes made a similar microphone with carbon rods which gave improved results. The texture of carbon provided a greater variation of resistance with sound; it was more sensitive. The idea was further developed by a clergyman named Hunnings; he chopped up the carbon rods into granules and put them into a diaphragm container.

Edison thought of carbon to improve the telephone; he used a wafer disc of graphite (lamp black) in contact with a diaphragm, thinking that its resistance varied under pressure, but the idea was misconceived. Hughes firmly put forward the theory that the action was due to contact resistance of the carbon.

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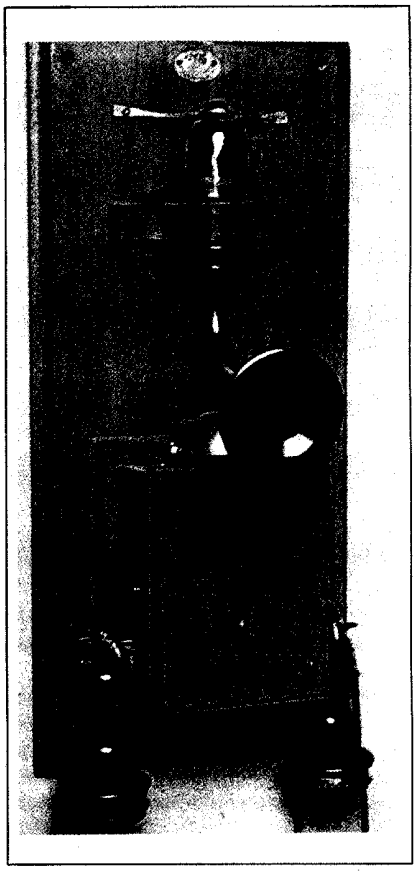


Right: Telephone of the New Telephone Company. A direct descendant of Hughes' idea; a ball of carbon resting on two contacts in the glass at top.

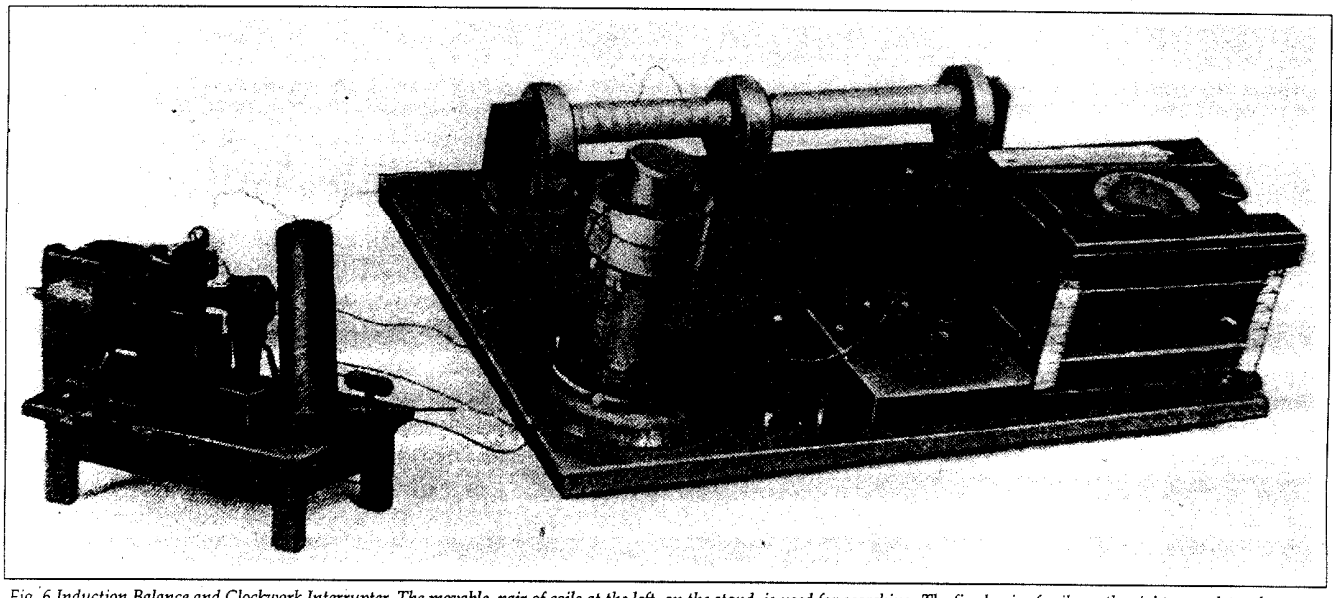


Fig. 6 Induction Balance and Clockwork Interrupter. The movable pair of coils at the left, on the stand, is used for searching. The fixed pair of coils on the right, completes the balancing. The coils on the calibrated slider at the rear, make a fine adjustment for measurements, or to null in the telephone.

For some time Hughes had an interest in an "induction balance" an early form of metal detector. The "Electromagnetic induction" of Faraday was still the great fashion, and he was keen on investigating the molecular structure of metals and alloys. "Break them up, and subdivide enough, and molecules could be little magnets", he said.

The induction balance is a balance of opposing magnetic fields from two coils of wire; the fields must be critically balanced so that when an object is put near them the balance is disturbed. A hundred years ago calibrated measuring instruments were rare, so Hughes employed the sensitive ear, adopting a telephone earpiece to detect a balance. In those days, the audio signal would be a battery with a clockwork switch interrupter, the "click click clicking" being the standard method of signal generation.

When President Garfield was assassinated in 1881, the Hughes induction balance was used by Graham Bell to look for the bullet in the body; these were the days before X-Rays. Legend has it that the bullet couldn't be found. The reason was probably that the body was on a metal bedspring.

The induction balance leads us to a fascinating part of Hughes' explorations. On one occasion, a satisfactory balance – a null – could not be made; he still had a click in his telephone. Investigation showed a loose connection. In the manner of a diligent researcher he investigated further, putting his imperfect contact microphone in place of the loose connection, with the same result. Putting the microphone, search coil and telephone at a distance, he could still hear the sound of the clicking.

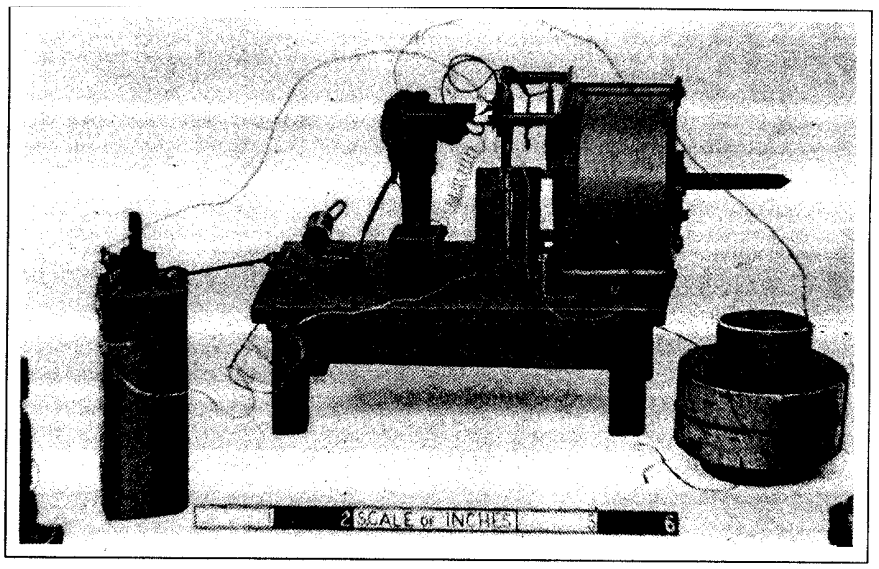
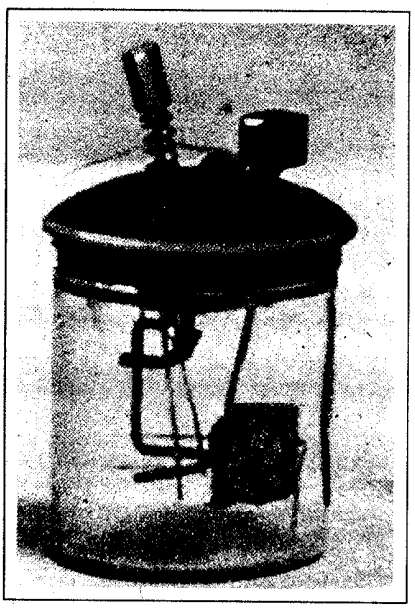


Fig. 7 (above) The transmitter: a battery connected to the clockwork interrupter and a coil from the induction balance. Fig 8. (right) The microphonic detector.



Deliberating, Hughes set up the induction balance to generate "electrical conduction" as he called it. He reported: "The whole atmosphere in the room would have a momentary invisible charge, which became evident if a microphonic joint was used as a receiver, with a telephone". So, at first he tried the experiment from one room to the next, then from the butler's basement to the maid's attic, 60 feet distant.

• *Continued on next page*

Historical

• *Continued from previous page*

Then he fabricated two identical coils, each of 100 yards of wire, and using a Daniell cell battery, put pulses of current through one. With the other coil, signals could readily be picked up with the aid of the microphone and telephone.

Now, we know the rudiments of radiation from a circuit of inductance and capacitance, with spark energising, and reception by a circuit of the same resonant frequency. The imperfect contact microphone became the detector, there being an element of rectification at the contact surfaces, probably due to the chemistry of oxide. Hughes was not aware of this at all.

Sometimes, he used a connection to earth via gas or water pipes – a relic of line telegraphy. On one occasion he used a fender as an aerial. Notes tell us that wires were tried "in the way of wings", as did Hertz, "Wires stiffened with laths to hold them in place".

In order that the imperfect contact would not be disturbed acoustically, it was put in a jar, and he called it the "microphonic detector". One of the best of them was a steel sewing needle resting on coke. The most sensitive detector was carbon (lamp black) on a loop of wire, resting on a hook of steel.

Although the equipment was delicate, it was portable and he was able to try the microphonic detector while out walking in Great Portland Street. He later wrote, "my usual method was to put the transmitter in operation and walk up and down Great Portland Street, with the receiver in my hand, with the telephone to the ear . . . at 500 yards I could no longer with certainty hear the transmitted signals".

A demonstration to members of the Royal Society took place at his house on 20th February 1880. His notes relate; "Mr. Spottiswoode, President of the Royal Society, Professor Stokes and Professor Huxley visited me today at half past 3pm and remained until quarter to 6pm in order to witness my experiments. . .

The experiments were quite successful and at first they were astonished at the results but at 5pm Professor Stokes began maintaining that the results were not due to conduction but to induction. Hughes later said: "Although I showed several experiments which pointed con-clusively that this was not so, he would not listen, but rather pooh-poohed all the results from that moment, until they hardly paid any attention to the experiments, even to the one working through gas pipe in Portland Street to Langham Place on the roof. They left very coldly, with none of the enthusiasm with which they commenced the experiments. I am sorry at these results of so much labour, but cannot help it".

In consequence Hughes did not pursue his investigations. Had he done so, with his great experimental skill and untiring assiduity, he would doubtless have got a great deal further – and the correct theory would have come after, as has happened before. Hughes knew it wasn't induction, he was an expert on it; as a telegraph engineer he had developed the idea of transposing telegraph wires carried on poles, to reduce cross-talk.

Hughes was not aware of the importance of his discovery, he was disheartened, and did not pursue his experiments. Some ten years later Hertz, a trained man and with university resources, gave a perfect demonstration, with a large induction coil, resonant arrangements, and a spark receiver.

Stokes, who trained at Cambridge as a mathematician, probably could not appreciate the expertise of Hughes because, like Faraday before him, it was totally non-mathematical. It is surprising that, being at Cambridge, Stokes did not remember the concepts of Maxwell.

"The Globe" of 12th May 1899 wrote: Hughes experiments of 1880 were virtually a discovery of Hertzian waves before Hertz and of wireless telegraphy before Marconi; the clock had been held back 20 years.

However Hughes became a Fellow of the Royal Society and was awarded the Royal Gold Medal for his work on the microphone and the induction balance.

Hughes did not patent the microphone, preferring to give it to the world of science. There was some controversy between him and Edison, who had developed his telephone as a disc of graphite being compressed behind a diaphragm, which was patented in 1877 as a commercial proposition.

Hughes was appointed a manager of the Royal Institution, and in 1886 elected President of the Society of Telegraph Engineers – later the IEE.

David Hughes died on 22nd January 1900 and, with his American wife, is interred in Highgate cemetery. Unlike many inventors, he had made a great deal of money and left £470,000 which he gave to charitable works; four London hospitals, the Royal Society, and the Academy of Science in Paris, and the Institution of Electrical Engineers to found a scholarship.

Marconi, at 26, said of Hughes when speaking on Wireless Telegraphy at the Royal Institution on 2nd February 1900: "I cannot forebear saying one word as to the eminent electrician who was placed in his last home as recently as Saturday last. For it is manifest that several years ago Professor Hughes was on the verge of a great discovery. . ."

The article printed here was the subject of a demonstration lecture, by the author, at the Edinburgh International Science Festival in 1990: it will be presented for the Institution of Electrical Engineers in 1992.

An Austrian crystal-set collection

An Austrian Society member, Erwin Macho, of Vienna, has built up what he considers to be Europe's largest collection of crystal sets, which come not only from central Europe but also from Britain and America. He invites members on holiday to visit him and compare notes about his 230 different receivers. Erwin collects only crystal-sets: no valve receivers or loudspeakers.

The collection is mainly housed in four large showcases in which sets are divided into groups. Naturally the largest section consists of Austrian sets, some of which are very rare. A separate section includes 68 sets from England and the USA dated between 1922 and 1960 – a group which is a favourite of Erwin's since it contains so many different ideas and forms of construction.

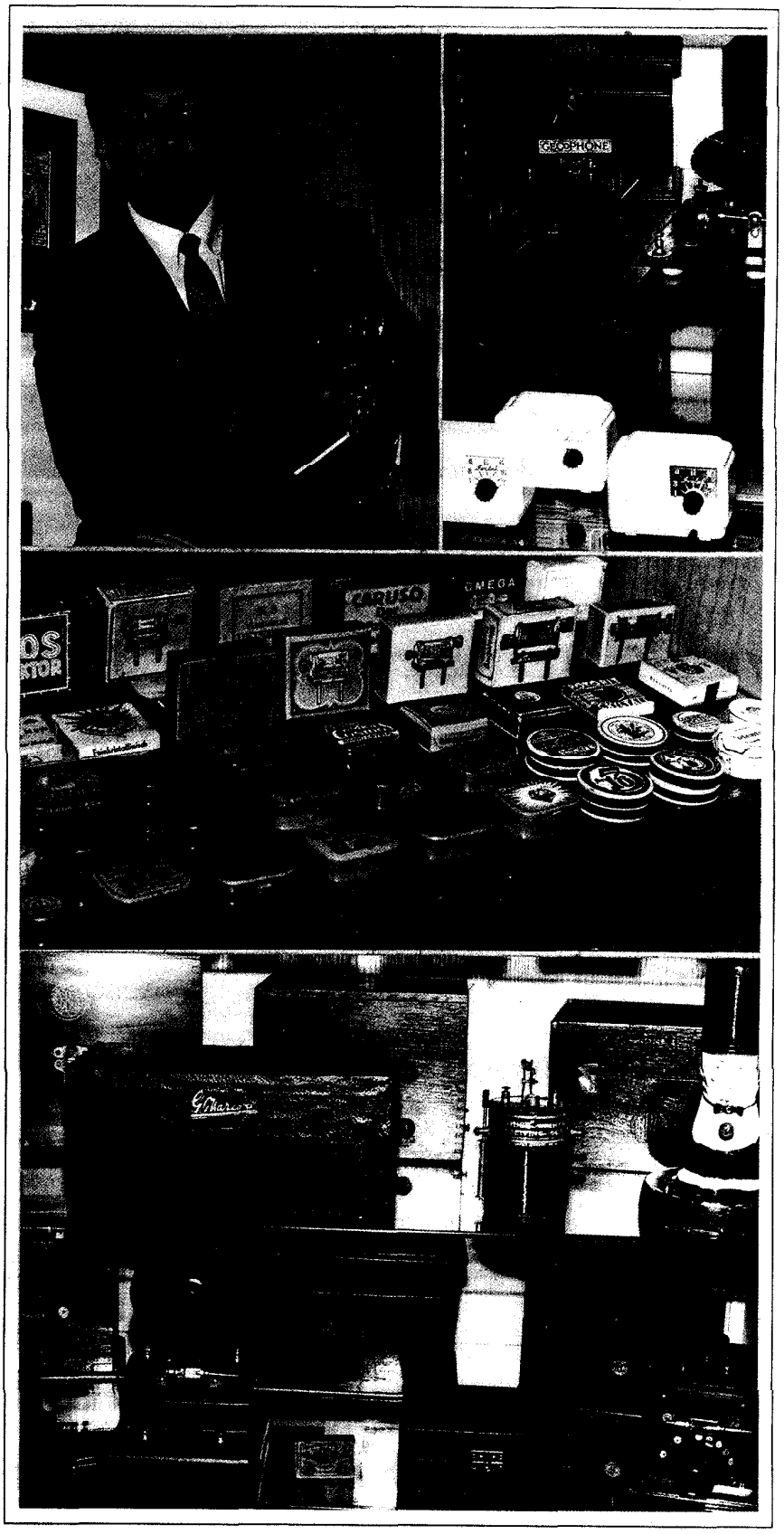
"Many of the American sets are primitive and cheap looking. But what a difference in the case of the British ones!" writes Erwin, "A great many curious and clever ideas were thought of and were incorporated into sets. For instance, there's the "Uncle Tom" crystal set which is based on a china ornament, the one built in a matchbox and the Edison Bell set which has its detector illuminated by a bulb so you can see how well the castwhisker is contacting the crystal".

In the British and American section he also displays "modern" receivers, mostly from the Fifties, which are still "crystal sets" in the old sense but make use of modern germanium diode detectors.

Another showcase in Erwin's little museum contains a miscellany of receivers from Germany, Spain, Belgium, Denmark, Sweden, Hungary and Poland.

"The collection explores the ideas of a fascinating period of 'listening without energy' during which these crystal radios operated without batteries or mains electricity, being powered entirely from the energy transmitted from the broadcasting station and received via the listener's aerial" says Erwin.

Members wishing to correspond with Erwin, who is still seeking novelties like the Kenmack book and the Felix, can write to him at Ambrosweg 17/A/8, A-1230 Vienna, Austria.



(Top left): Erwin Macho, holding a rare American "Martian" crystal set. (Top right): British crystal sets including Fifties ones with modern diodes as well as Twenties originals. (Centre): A nice display of crystal detectors and cartons, many with fascinating names like "Neutron", "Omega", "Mighty Atom", "Caruso" and "Hertzite". (Bottom): Pre-war and post-war American sets

'Best of the show' at the 1929 Radiolympia

The Philips 2511

by Geoffrey Dixon-Nuttall

Philips receivers were barred from Radiolympia in 1928 as they were imported, in 1929 however they managed to get in as they then had a British factory. The 2511 was at the1929 Show, although all the specimens I have seen are firmly marked "Made in Holland".

The set was featured by "Wireless World" with a rave review. As a result of a readers' poll, it was voted "Best of Show". It was described as the first all-metal four valve set. This sets the scene, because wooden chassis were still common. The real feature of this set was its ease of operation. The 2514 was an excellent receiver (see "Bulletin"13:3), but it had its little ways. The 2511 had two knobs and a switch, and even the lady of the house could work it after a bit of practice. So could the cook, which is probably why it had a lock and key!)

As Philips' flagship it was an expensive production, selling for £37 10s. This is probably equivalent to about £600 nowadays.

For the money you got probably the most unbreakable radio ever made. The cabinet is built on a frame of angle girders welded to a platform, which supports panels of thick paxolin finished in a sort of mock rosewood, with a high gloss. Although heavy (45lbs), this set could probably be dropped for some distance without damage. The top is a steel frame held on by four almost inaccessible screws, one of which was sealed up to prevent tampering. If the seal was broken Philips wouldn't repair it, and nobody else could as there was no information available, so there you were.

The set is built on two chassis, for the radio and power pack. When the lid is opened nothing can be seen except a set of black boxes and Philips were apparently reluctant to let even "Wireless World" see inside. It is difficult to see what the fuss was about, as there are few surprises in the circuit.

This is easier to describe than to draw. The aerial is capacity coupled to the top of the first tuned circuit which is in the grid of the first R.F. stage. This has another tuned circuit in its anode, as has the second R.F. stage. A leaky grid detector follows, with R.F. filtering in its anode by two capacitors and a choke. Audio is coupled by a transformer to the output pentode. All stages are decoupled.

H.T. is supplied by a full-wave rectifier with smoothing in the negative lead, by a choke in series with three resistors. These supply bias, the centre resistor being the volume control which varies the bias to the first R.F. stage.

The output is intended to feed the Philips moving coil speaker type 2113, known to its friends as the Thing from Outer Space. This has a 30 ohm coil, but there is also an output at 2,000 ohms for a moving iron. Neither of these output impedances is much use for a modern speaker!

The tuning coils are of the toroid type, presumably because the inductance could be adjusted knowing that it would not be altered when the screening was fitted, as toroids have no external field. Nevertheless extensive screening is fitted, to be safe. No reaction is used, but the sensitivity is very satisfactory.

This chassis contains one of the first three-gang tuning capacitors. This is of such impressive size that a counterweight is fitted to prevent it turning of its own accord. An ingenious interlock is fitted, so that the set cannot be switched on if the lid is open, and conversely the lid cannot be opened if the set is switched on. The lock has two positions; the first turn of the key locks the lid, and the second locks the switch in the "off" position.

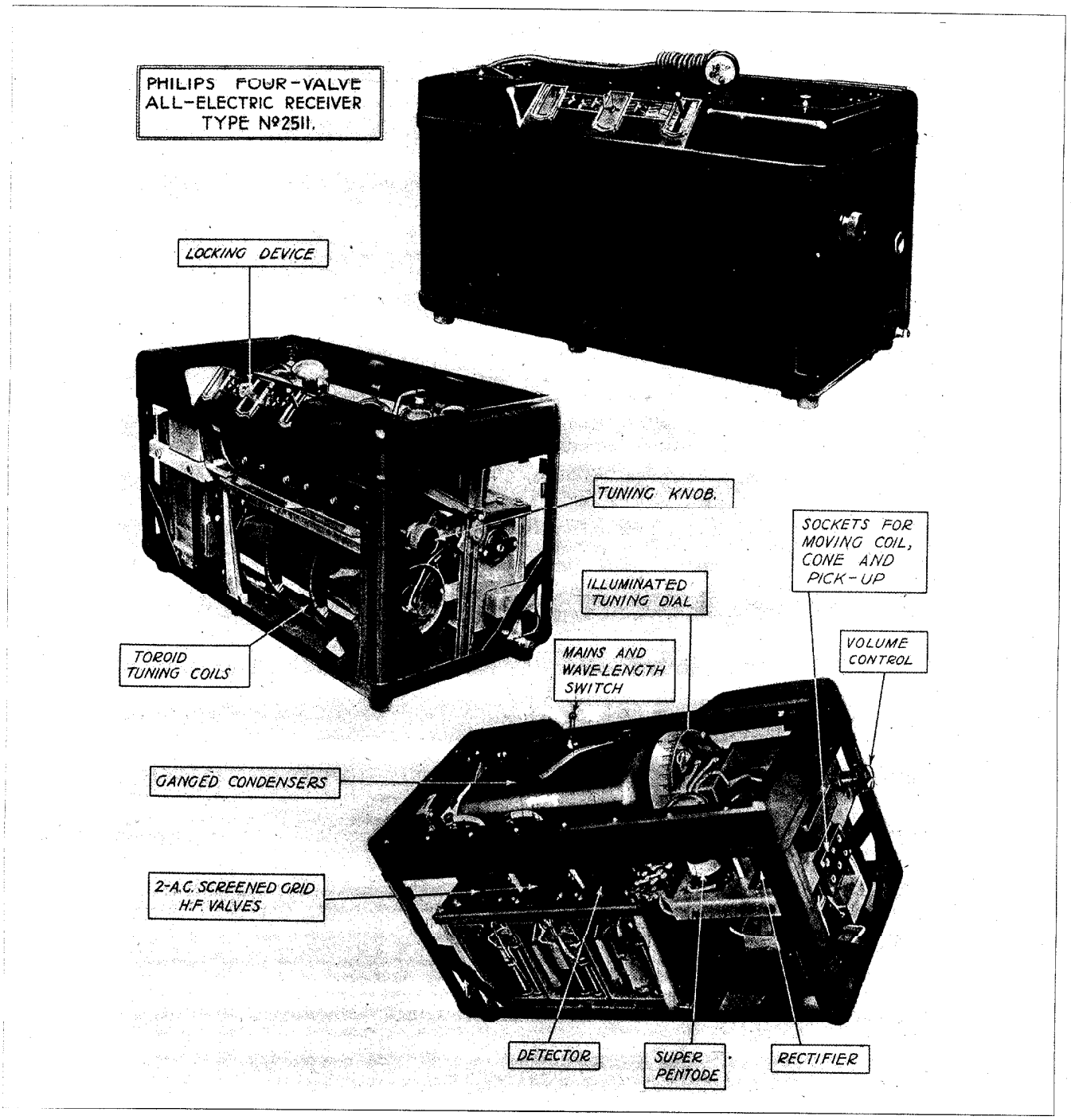
The 2511 underwent various minor modifications during production, the later versions being available with a frame aerial and abandoning the toroids. In fact the later coils are probably similar to the Superinductance type. The frame aerial was probably used to help the selectivity, which was not the set's strong point.

Although this set did not have a very long life in production the chassis was used as a basis for other models. There were two consoles, the 2601 and 2607, and a radiogram (2811) which was priced at no less than 80 guineas. The 2607 had a device called the "Philector" which improved the selectivity, presumably by introducing reaction. In 1931 there was a D.C. version (2553) with two output valves in parallel to get some decent output from low H.T.. There was a console version of this, too (2653). To get the centre of gravity down the chassis was at the bottom of the cabinet, necessitating the longest dial drive ever. There was also an export version of the 2511, called the 2510.

The Classics:

There are certain items of vintage equipment which earn the title "Classics" for different reasons. Some may be milestones of technical innovations, others demand attention for their unusual or even eccentric design, or because they represent a particular period of social history. The odd crystal sets of the twenties like the "Old Tom" with its coil wound round the top-hat of a china figure find an early place among the classics, as does the Marconi RB10 which added a valve to an established crystal-set. The Marconi V2 with its unique "spade-tuning" perhaps leads the list of classic valve receivers, which continued through the wood-boxed sets of the thirties to the first of the "round Ekcos" which heralded a major cosmetic change which was to stop in Britain abruptly with the second world war and its "Utility" set, to be resumed when peace returned with the now ubiquitous DAC 90, only to change again with an excursion into the updated art-deco of the chromium Emor Globe, before returning via the miniaturisation period which sounded the death-rattle of the valve in "personal portables" ending with the hybrid Marconiphone P60B, to the "scientific instrument look" of the early days, repeating not only a history of external appearance but even the idea of the catswhisker-and-crystal ancestor of modern solid-state devices.

Members of the British Vintage Wireless Society who have an interest in any aspect of design and have in their collections items which they consider qualify as classics, are invited to contribute articles.



Restoring the 2511 is straightforward, the only tiresome feature being the number of parts that have to be removed to get at anything! Most of the capacitors will be found to be usable, and as the resistors are all wirewound they will either be the correct value or O/C. Note that the resistors are wound on glass tubes which are *rivetted* in place. This must have been one of their specialities; I don't know how they did it, but it must have been nerve-wracking! There is the usual Philips problem of the lack of headroom for the valves, and these have to be specially selected. Due to the excellent screening the screen grids can be replaced by pentodes, giving higher gain, without instability. The screening can over the first three valves must not be left off.

Apart from the selectivity the performance of the 2511 is very impressive, particularly when one remembers what the competition was like in 1929. The tone quality is quite good too. The set was originally supplied with two "tone filters" which fitted in between the speaker plug and the set. I have one of these which contains a resistor and capacitor in series, and removes the unpleasant "pentode top".

Note that unlike the 2514 this set does not have complete coverage from 200-2000 metres, but has the two usual bands covering MW and LW

Due to the good all-round performance and the high cost some of these sets were in use for many years. Probably the owners, apart from being quite fond of them, could not summon sufficient strength to throw them away!

Museum man goes visiting

New Zealand trip

During a three week visit in New Zealand, Society member Douglas Byrne, the curator of the two wireless museums on the Isle of Wight, naturally visited as many vintage radio collectors and museums as possible, before flying out to Hawaii – where he says he found a dearth of antique wireless-sets but plenty of dusky maidens in grass skirts!

Douglas has sent the photographs and news of New Zealand collectors reproduced on this page.

John W. Stokes, the well-known writer on antique wireless, has a fine collection in his home at 281-C Hillsborough Road, Mount Roskill, Auckland 4.

As well as shelves full of radios from the pre-war days, there is a special exhibition of horn loudspeakers, microphones, valves and old electric light bulbs.

John is Editor of the Bulletin of the New Zealand Vintage Radio Society. He has written several notable publications including "70 Years of radio tubes and valves", "The Golden Age of Radio in the Home", and – recently – "More Golden Age of Radio."

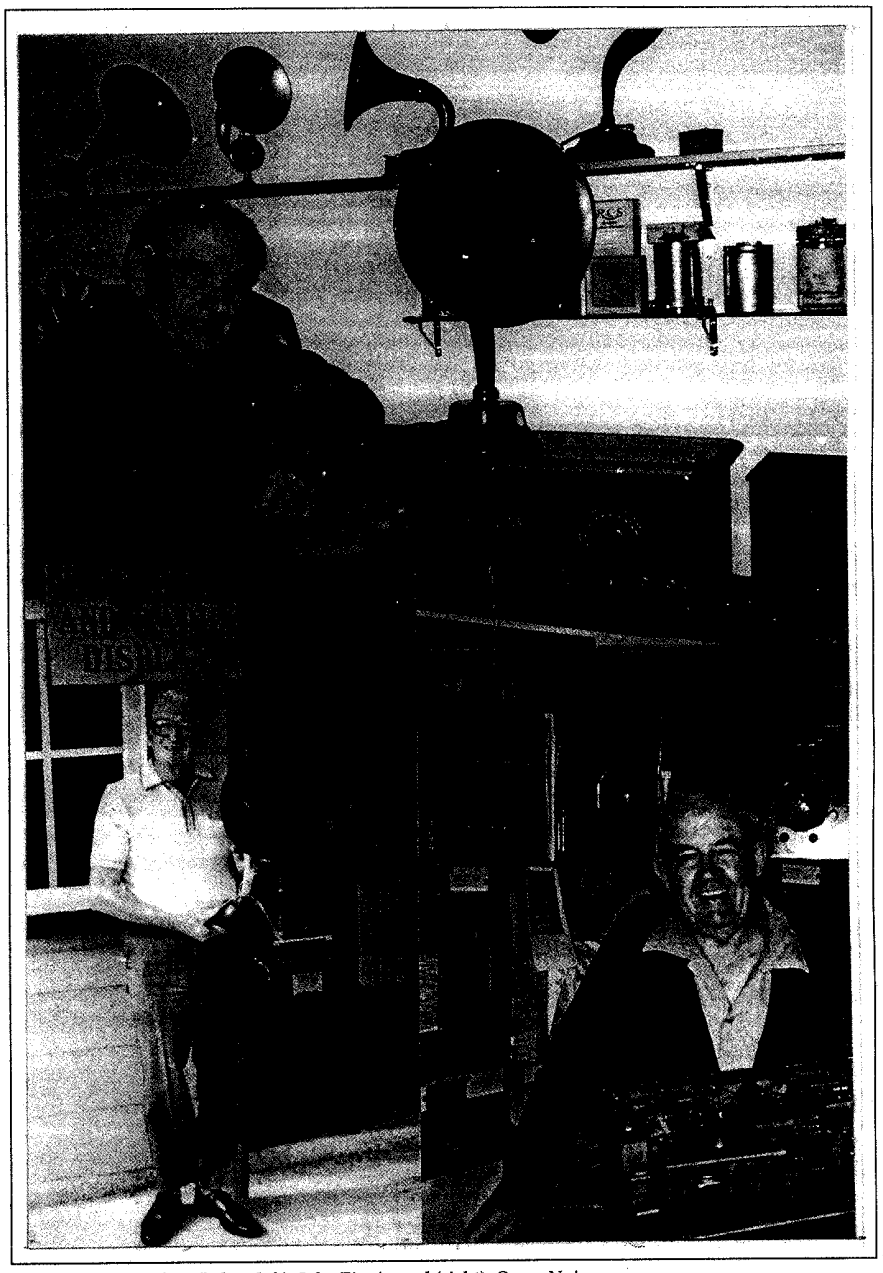
Anyone wishing to visit him, should ring him first on Auckland 656615, or Brian Marsh, treasurer of the NZVRS, on 667 712, who can contact other collectors.

The wireless museum at Brayshaw Park, Blenheim, NZ, was established by 76-year-old ***John Finnie*** only a couple of years ago but is now well-known throughout the area.

Open on the first Sunday in each month, it is situated in a large public park full of old-time shops and offices crammed with memorabilia. There is a miniature railway to take visitors round the park and a boating lake.

The wireless museum has numerous radios of the pre-war and just post-war era, all of which are well displayed and described, and there is also a large collection of old valves and pre war wireless magazines. A special feature is the transmitting and receiving apparatus from the shortwave station of the late Mr. Michael Spiers, callsign ZL2KW.

Anyone wishing to see round the museum should contact Mr. Finnie by ringing Blenheim 87641 or writing to him at his home, 114 Muller Road, Blenheim, NZ.



(Top): John W. Stokes, (below left): John Finnie, and (right): Owen Nairn.

Although he started collecting only eight years ago, on retiring, ***Owen Nairn***, of Disraeli Street, Hawera, NZ, now has 70 fully restored old radios in working order. They date from 1925, the majority being in the 1930's to 1940's era, and include ones manufactured in England and the United States as well as in New Zealand. Owen has also restored twenty vintage car radios, the oldest being a Philco model of 1933 designed for Studebaker cars in the USA.

He estimates that it takes him about 200 hours to rebuild a damaged old wireless set to new condition.

A radio operator during the war, Owen worked as a radio service-man for many years. He began collecting when farmer clients brought him old radios: Owen would mend one set free of charge in return for the gift of another. He collects 78 records too, of which he has over 2000 featuring artists from Caruso to Vera Lynn.

Two other museums well worth a visit are the Museum of Transport and Technology in Auckland, and the Communications Museum in Waikanae – tel 058 36189.

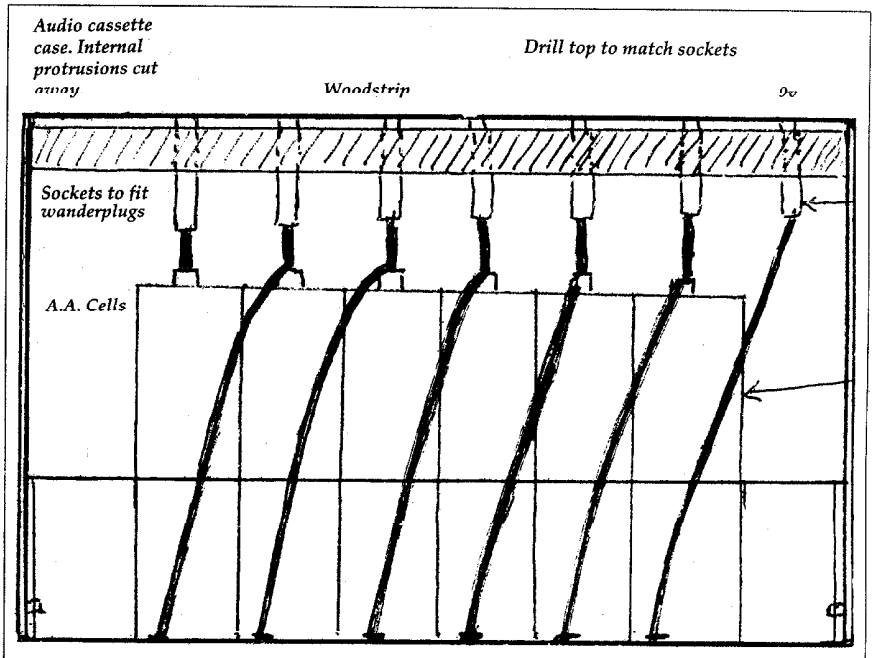
Editor's note: Society members who have visited museums and small collections in the UK and abroad are invited to send details and photographs. It would be nice to make a comprehensive world-wide listing with photographs and descriptions.

Feedback

Letter
from George Mechan
Grid bias battery

I note in the current Bulletin an article on power supplies by member Pat Leggatt, a section of which states "The traditional grid bias battery is hard to come by". This is very true, and I doubt if some of the younger members have ever seen a G. B. battery!

I have therefore enclosed a sketch of a method of making a G.B. battery, using a modified audio cassette case. This is very painless, owing to these objects being transparent and in two pieces, the whole job can be done in sight. Owing to the low current demand, the cheapest batteries may be used. The complete unit can then be slipped into a suitable sleeve. I personally copied an old "Pertrix" logo. Suitable sockets are to be found in any "junk box", valve-holders, gram sockets, anything that takes a wander-plug. As an additional bonus, the batteries are easily replaced, which is more than I can say for the original G.B. batteries!



Constructing a 9v grid bias battery using an audio cassette case. "A.A." size batteries fit firmly into case. The complete unit may then be slipped into a sleeve or case made from stout cardboard and cosmetically finished as desired.

Letter
from Colin Glanfield
Gandolfi Wireless?

During my research for a book on the Gandolfi family of camera makers, notes from Fred (the dominant brother), showed an interest in radio, both as a hobby, and later as part of the business when radio cabinets were made for several manufacturers. The period was 1924-5.

Fred's own words: "Noting my enthusiasm in constructing a few wireless sets, my father Louis approached Fallowfield Ltd, and persuaded them to order a number or crystal sets in small cabinets. This was successful, and as a side-line various types of cabinets for multi-valve sets were made for local wireless dealers." In other notes, and I quote: "With the coming of the wireless age in 1922, the Ensign factory took to making wireless cabinets of all types and built up a large organisation in this new field, which helped considerably to off-set the decline in the camera section."

Hand written notes mention a four valve set, which Gerald Wells guesses to be a Henderson, though could have been a custom job for Mitchells, the only other big Peckham dealer at the time. Rupert Loftus-Brigham has a Henderson set in need of restoration, and confirms the beautiful solid cuban mahogany workmanship of the cabinet.

This relationship between radio and photography continues to this day. Companies such as City Sale & Exchange, Westminster Photographic, Army & Navy and others did sell in both fields as branded and 'own make'.

My particular need is for any catalogue or period advertisement to fill a page in my Gandolfi book and, if possible, the loan for photography of a suitable radio set. If any radio enthusiasts would like to know about say Ensign, I can put them in touch with a suitable expert.

P.S. Fred's own radio went the way of all flesh, though according to his remaining brother Arthur, he kept the wood, I wonder who has a camera made from it?

Letter
from Fred Heys
'Double-two' set

I possess one of the "Double-two" sets illustrated in Bulletin 16/2. It works extremely well and has the original Double-two values HX210 and LX230 which are etched with the "2/2" logo. They are also stamped 'made in Hungary' (probably by Tungsram).

These sets could have been made for Hustler Simpson and Webb as the "chassis" and connections are very similar to early KB sets (could they have made it?) also on my set there is a label stuck to the bottom near the transformer "No. F/25". If it was made in England why use unknown Double Two valves? Was the label put in by H. S. & W.? The variable condensers are made by "READI RAD" which I think were made in England.

I also have other Double Two valves in my collection, but my set, which I think is original, does not include a grid leak as shown in your theoretical diagram. I have a strong feeling that these sets were imported from the continent – probably Austria or Hungary. There was also a Luxe version.

Letter
from George Mechan
'2-2' again

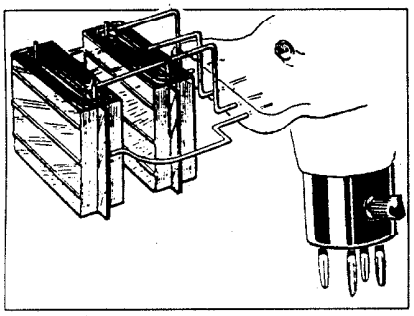
I can recall these being advertised. There is no connection with the shirts which were many years later. The "Double Two" was probably arrived at by the fact one was able to change wavebands without coil changing, which was still commonplace at the time.

Re sets obtainable with cigarette coupons I believe the "Carlton" was in this category. The brand was either "Ardalth" or "Kensiton".

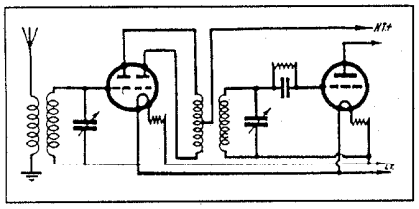
Feedback

Letter:
from Ian Higginbottom
Another damp squib

Following Desmond Thackeray's article on the Stenode in the last Bulletin, I find that another of Dr. James Robinson's exploits was his self-balancing valve. This contained, in a single envelope, a duplicated anode and grid assembly (without filament)



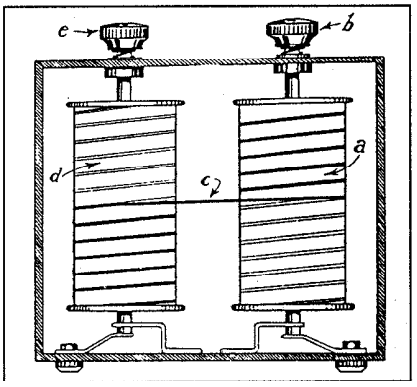
which served as the neutralising capacitance (vagaries of external wiring and manufacturing tolerance apart). It was produced by Mullard and used by RI-Varley for the two HF stages of their 5-valve Intradyne receiver, as shown at Olympia in September 1927. The two grids were strapped together internally and the second anode was taken to a side terminal, so that outwardly it resembled a Philips-Mullard pentode of the following year. The two sets of electrodes were mounted one above the other, as shown in the illustration. In the Intradyne the two anodes were connected to either end of a centre-tapped HF transformer primary in a tuned anode circuit.



Unluckily, with consummate mistiming, Dr. Robinson launched his invention at exactly the same time as the screened grid appeared in Britain, so that although the Intradyne was still available the following year, nothing further seems to have come of the idea. I have never seen one of the Robinson valves. They must be rare and it would be interesting to know whether any survive.

Letter:
from Desmond Thackeray
The Intradyne

Ian is probably right to cast some doubt upon the technical viability of this development. But it was also economically a doubtful runner, requiring the manufacture of a special valve to do what could be done already by using one standard triode plus an idential one with burnt-out filament. This misfire reminds me of a parallel mistiming of a little book on the four-electrode valve by publishers Mills and Boon. (I'm not kidding!). This little book, (by Fred. Goddard, published Sept. 1927), concerned itself with the space-charge cancelling valve, and *also* reached the market just in time to have its thunder stolen by Round's screen-grid valve. However, at least the little book dealt with a viable, if never very popular, technique, and valves such as the Thorpe K4 can still be seen today. Cross-neutralisation of an idential pair of valves in transmitters, with *both* valves active, is certainly a viable technique, and should not be confused with Robinson's idea. Again we are faced with the uncertainty as to whether Robinson was really unable to spot the flaws in his own scheme.



Letter:
from Geoffrey Arnold, Editor Radio Bygones
Immortal coil

I was interested in the comments on page 18 of the Bulletin regarding the continuously variable inductance. Whilst it may not have been further used in domestic receivers, it has certainly been used in transmitters.

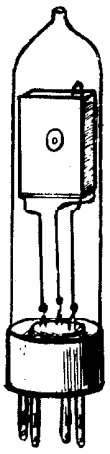
I came across it in the 1kW ISB transmitter type NT201, produced for the Royal Navy by Marconi's Wireless Telegraph Co. The NT201 was installed in a number of passenger ships by Marconi Marine at the end of the 1960's for use in the expanding ship-to-shore HF SSB radiotelephone service, as there were no SSB transmitters specifically designed for merchant ships available at that time.

The aerial tuning unit used an arrangement almost identical to that shown in the drawing. The inductance consisted of a phosphor-bronze strip, 30swg x 3/16in wide, which was wound onto a spirally ribbed ceramic former. The unwanted length was taken up on an earthed metal drum, similarly ribbed. The coil former and the drum were probably around 5 inches in diameter, and both were driven via a gear train by a single knob fitted with a winding handle.

Coupled to the gear train was an end-stop mechanism, designed to prevent the strip being torn off its fixings. If this went out of adjustment, or was over-driven by a zealous operator searching for a 'dip', one was faced with having to retrieve and rethread the strip and drill new fixing holes, or eventually having to replace the entire strip from spares. I have a small coil of the strip in my junk-box to this day.

The NT201 was a tremendous source of heat, being all valved, of course, and incorporating no less than six crystal ovens. I did a lot of fault-finding, repair and realignment work on those fitted in P & O passenger liners. The 3kV HT for the pair of QY4-250's in the final stage was fed from the power unit via a length of UR39 coaxial cable with the braid earthed at the PSU end, presumably as part of a filtering regime. At the final stage end, the braid was simply trimmed back and sleeved. The shattering noise produced if the centre conductor flashed over to the braid lives with me still.

Letter
from Dr. T. C. H. Going
The Deuterium lamp – 1



I have is a little information about these lamps, though I have nothing specific about the one mentioned. They are a form of hot-cathode lamp, and should be treated like a mercury vapour rectifier, that is, the heater should be allowed to warm up for about a minute before any attempt is made to strike the arc. Heater currents may be several amps at from two to six volts (dull red glow) and the arc must be limited with a ballast resistor, as it has a "negative resistance" characteristic. The normal use for these lamps is as an intense spot source of ultra-violet to blue radiation, of even spectral quality without 'holes' in the spectrum, for use in spectro-meters in the scientific laboratory. Therefore the light output should not be looked at except through UV absorbing glass, and if the tube is made of quartz, the telltale whiff of

• Continued on next page

Feedback

• *Continued from page 28*

ozone may become apparent. I think these lamps were filled with deuterium from the 1950's; earlier hydrogen was used. The anode is 'down the little hole' as seen in the illustration; the outer metal part is just a screening box, and the coiled cathode ribbon will be inside and to one side. The life of these lamps is about 100 to 200 hours, and the cost today is over £90, new. They are made by Cathodeon in this country, and Hanovia in Germany. When the tube is failing, the light output will be noisy, or just won't strike when the necessary H. T. pulse is applied. Could these lamps have a radio or audio use? I think the answer maybe, is yes, hence the ITV origin. The late lamented James Moir says in his book[1] in relation to the recording of sound-films: "As light scatter in the surface layers of the photographic emulsion is also appreciably restricted by the use of monochromatic light, this results in a valuable gain in image sharpness. A narrow band at the ultra-violet end of the spectrum is normally employed. The film is developed in the normal manner, ordinary white light being used in the projector sound optical system. He also refers to a paper by Dimmick[2]. I once had a lamp catalogue which was offering. 'Deuterium Lamps' (presumably with a specially short and uncertain life) and also 'Rubby lasers' (specially developed for Aladdin, maybe.

Now who can tell me where I can find out about Ediswan Pointolite lamps in any detail?

Refs: [1]Moir, J. High quality sound reproduction, 2nd edn, 1962. P584-585 London: Chapman & Hall. [2]Dimmick, J. "Improved resolution using ultra-violet light' J. Society of Motion Picture Engineers, August 1936 issue.

Letter
from Desmond Thackeray
Deuterium Lamp – 2

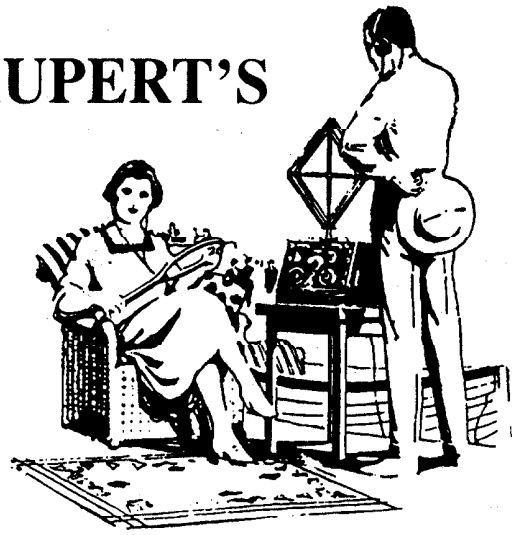
Regarding the mysterious Deuterium Arc lamp of Graham Dawson's letter, what he has discovered is an uncommon and expensive source of ultra-violet light. At one time, hydrogen arcs were used; but deuterium provides a stronger and more extensive continuum spectrum in the far ultra-violet. The general application is as a radiation source in UV absorption spectrophotometers, and both this lamp and the photomultiplier detector have UV transmitting envelopes. I do not suggest that Graham runs the lamp unshielded as there could be enough UV emission from the lamp to ruin his eyesight permanently. Rather offer it to the nearest Technical College which probably uses such spectrometers in its chemistry teaching. They might also like the photomultiplier if Graham has this too, though these are often pretty enough to be put in a display cabinet.

I can't offhand think of any obvious TV use for a point source of UV light of this kind. And indeed the somewhat larger xenon arc lamps with copious visible emission are better suited to glass optical systems, and mercury-in-quartz discharge lamps generally more appropriate for fluorescent applications. I would suspect there-fore some misconcepton led to its inclusion in valve stocks in an ITV company; but would it be worth writing to M.S.Co. who might well know of unusual applications for their products?

Letter
from F. Cecil Grace, USA
Immortal coil- 2

The "curious tuning device" (Bulletin 16/2 *did* go into production). With improvements, such as grooving the cylinders in opposite directions and using meshing spur gears, single-dial tuning would be possible. Using a variable capacitor ganged to the device, an enormous tuning range would be available without band switching.

RUPERT'S



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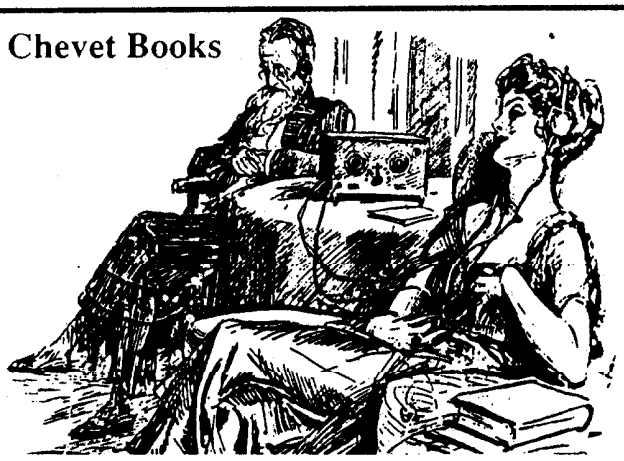

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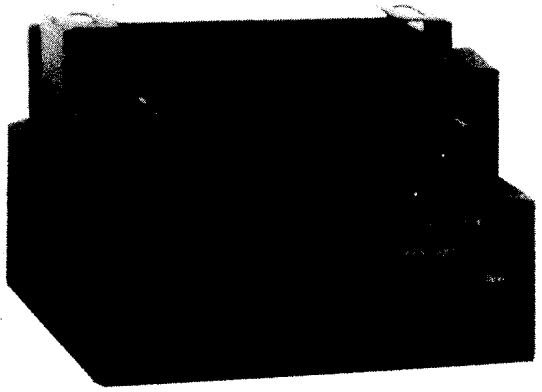

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