

WIRELESS, incorporating 'Wireless Weekly,' OCTOBER 23, 1926

WIRELESS



INCORPORATING
WIRELESS WEEKLY

2^D
WEEKLY

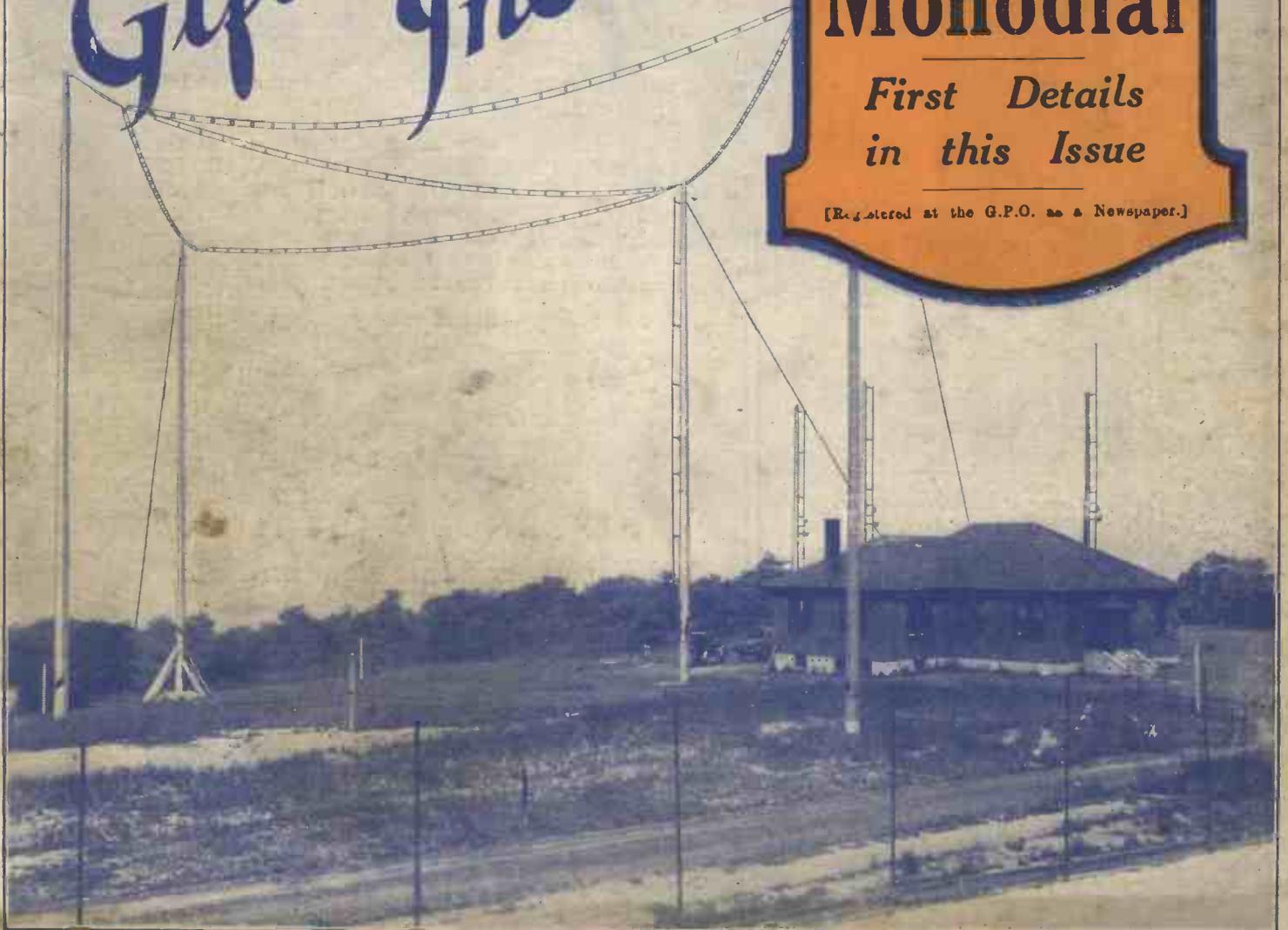
*Free Book
Gift Inside*

Vol. V | OCTOBER 23, 1926 | No. 10

The Monodial

*First Details
in this Issue*

[Registered at the G.P.O. as a Newspaper.]



Another
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 GIFT**
 for every
 reader



Mr. G. P. KENDALL, B.Sc.,
 Designer of the "Spanspace Three"

The contents of this issue:
 THE "INVALID'S THREE"
 described by J. H. Rayner, B.Sc.
 (Hons.), A.M.I.E.E.
 A further article on the "DISTAFLEX TWO,"
 one of the Radio Press Star Sets,
 described in the October issue.
 Notes on the "NIGHT HAWK"
 another Radio Press Star Set
 by Percy W. Harris, M.I.R.E.
 "PREPARE FOR THE WINTER"
 by Capt. Jack Frost, M.I.R.E.

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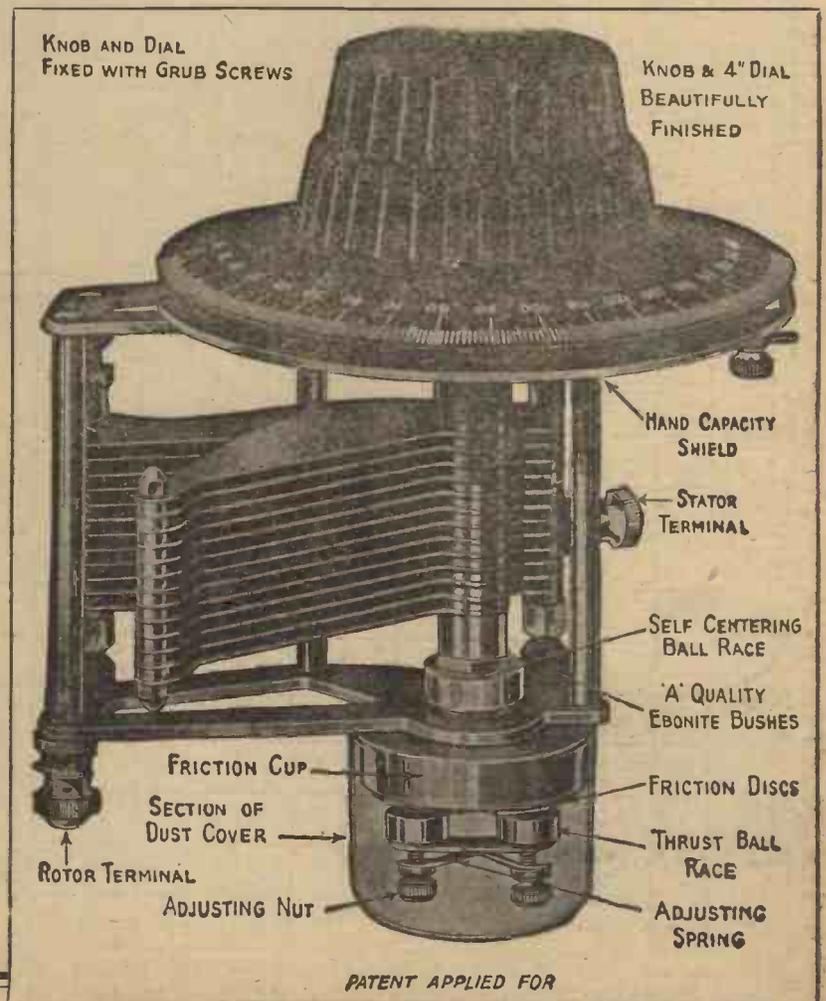
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DYNAMIC CURVES

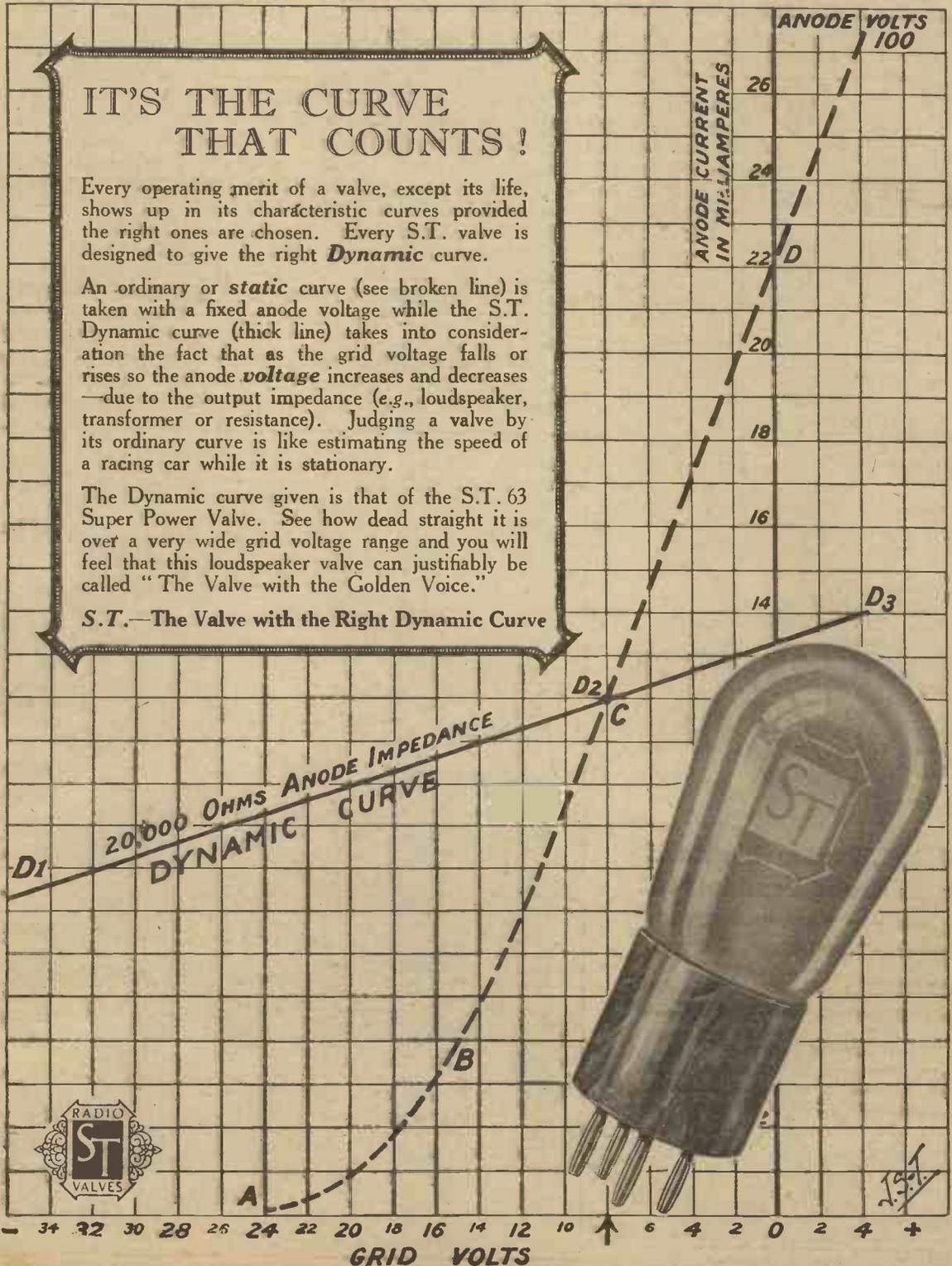
IT'S THE CURVE THAT COUNTS !

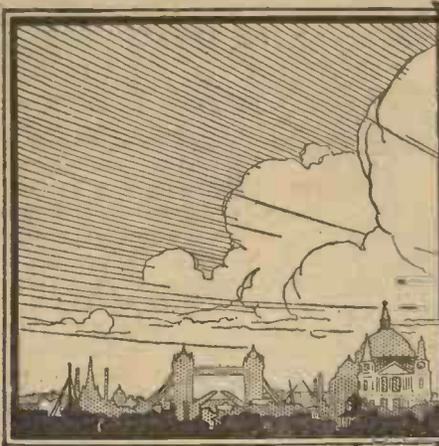
Every operating merit of a valve, except its life, shows up in its characteristic curves provided the right ones are chosen. Every S.T. valve is designed to give the right *Dynamic* curve.

An ordinary or *static* curve (see broken line) is taken with a fixed anode voltage while the S.T. Dynamic curve (thick line) takes into consideration the fact that as the grid voltage falls or rises so the anode *voltage* increases and decreases—due to the output impedance (e.g., loudspeaker, transformer or resistance). Judging a valve by its ordinary curve is like estimating the speed of a racing car while it is stationary.

The Dynamic curve given is that of the S.T. 63 Super Power Valve. See how dead straight it is over a very wide grid voltage range and you will feel that this loudspeaker valve can justifiably be called "The Valve with the Golden Voice."

S.T.—The Valve with the Right Dynamic Curve





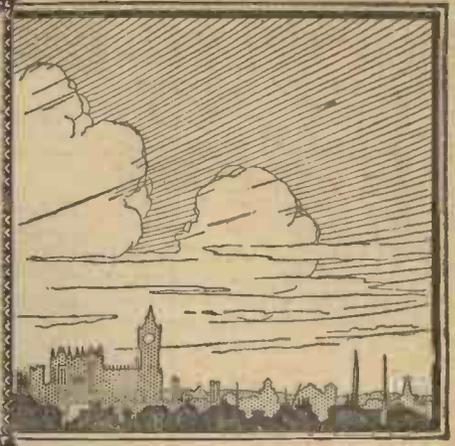
WIRELESS

INCORPORATING
WIRELESS WEEKLY

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THIS WEEK'S NOTES AND NEWS

Martians Again

MY first injunction to you this week, dear reader, is this: On no account forget to listen for Mars on the night of October 27. I am told that on this date the planet will be in the most favourable position that it has occupied for 100 years, as far as observations are concerned. I have not yet forgotten the "four mysterious dashes" that were said to be the fault of the long-suffering Mars last time he dared to come near the earth. Anyhow, remember that if you hear a signal that sounds like a piece of string it is *sure* to be Mars!

Congratulations

MR. ERIC DUNSTAN, the chief announcer at the London station, is reported to have been appointed general manager of the new Indian Broadcasting Company. I hear that he will have to master some 200 languages, although, fortunately, he will not have to repeat each of his announcements in all of them! He will be missed in London, and I am sure our best wishes go with him.

Crystal Control Difficulties?

THESE new wavelengths that have been causing people to think about rebuilding their sets for the past month or more are not to come into operation for another month! The exact cause of this postponement is not at present quite clear, but I have been told by a would-be humorist that the stations will at first have to work on any wavelength for which they can obtain a crystal!

And Another One

INCIDENTALLY, I like the story of the amateur transmitter who wanted to use "crystal control," but could not get a suitable quartz crystal. He therefore tried using a crystal of Rochelle salt, with the result that his wavelength "grew" about five metres per day, as the crystal increased in size!

"giggle," as the *Evening Standard* calls it, it is probable that in future, whenever possible, some thirty people will be allowed to act as audience in the studio.

The Abbey Broadcast

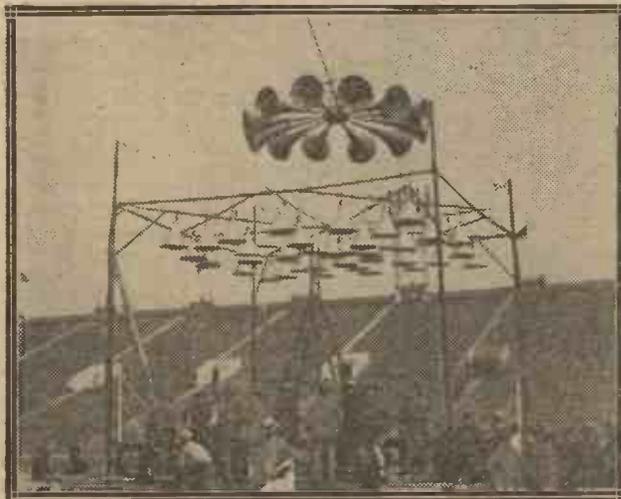
I THOUGHT the first broadcast of Evensong from Westminster Abbey was particularly successful. Once more the B.B.C. seem to have judged the amount of echo that is "good for one," so to speak. The wiring in the Abbey has been rigged up in a very thorough fashion, and I think we may look forward to hearing many special services from Westminster in the future. It is possible that such events as Coronation services, Armistice Day services and Royal weddings will in time be broadcast as a matter of course. There is a microphone in the pulpit, two in the organ loft, one at the lectern, and points at which extra microphones may be connected all round the chancel. I walked round the Abbey just after the first service, and at first could find no trace whatever of the engineers' work.

Perplexing

THE areas on the B.B.C. "black list" and oscillation chart seem to be playing a regular game of "General Post." I was told by one of the officials

connected with this branch of the B.B.C. organisation that it is a very rare occurrence for one area to be the "worst ever" for more than one week. The next week generally sees a great outcry from some other neighbourhood in quite a different direction.

AN ECHO OF THE FIGHT



This photograph, which has just arrived in this country, gives a good idea of the elaborate preparations for the Dempsey-Tunney fight at Philadelphia. The announcements were made through the loud-speakers seen above the ring.

That Laugh

THE question as to whether there should or should not be a "studio audience" is still causing the officials concerned quite a lot of anxiety. Although the B.B.C. has received quite a few complaints about the "radio

This Week's Notes and News—continued

A Daventry Problem

THE B.B.C. has come to the conclusion that Daventry may possibly suffer from screening from its own metal masts. This screening effect can, of course, only operate in the directions in which the plane of the aerial itself lies, but even so it may be quite troublesome to some listeners. Experiments are being carried out with a view to solving the difficulty.

Another Hospital Equipped

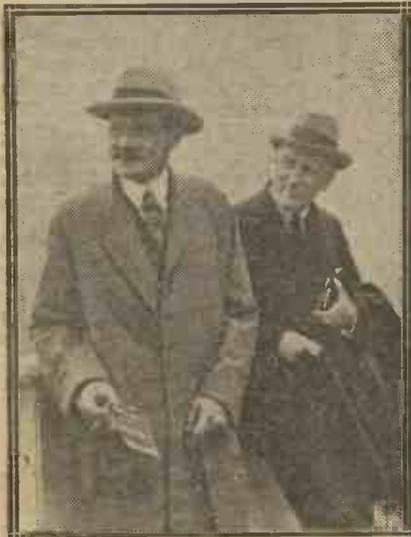
I HEAR that a six-valve set with twenty-five pairs of headphones has been presented to Aldershot Hospital. The whole of the cost is being defrayed by public subscription.

Armistice Day

SPECIAL Armistice Day programmes are to be broadcast on the morning, afternoon and evening of November 11. I do not know as yet, however, whether we shall hear the actual service at the Cenotaph.

An Australian Achievement

WHILE Sir Alan Cobham was in Australia he broadcast a speech, and very shortly afterwards received a



The Earl of Clarendon (left) arriving at Southampton after an extended visit to Canada. Lord Clarendon, readers will remember, is reported to be the new chief of the B.B.C., and it is now stated unofficially that he will take over his new duties in January.

cable from New Zealand saying that every word had been heard clearly. Seeing that the distance is something



One of the popular weekly features in the 5IT programmes is music by Harold Turley's Orchestra from the Prince's Cafe, Birmingham.

like 1,300 miles, I think this speaks well for the efficiency of Australian broadcasting stations.

Don't Forget This

HAVE you noticed that since we have reverted from B.S.T. to G.M.T. it is possible to run round the Continental stations as early as 7 p.m., instead of having to wait till 8 p.m.? This seems so obvious as to be silly, but I mention it because I have met three or four owners of big sets who have said, absent-mindedly, "Oh, Berlin won't be strong enough yet. It isn't worth while looking for him." So don't forget this!

Special Time Signals

TIME signals are now being sent which enable astronomers all over the world to calculate very accurately the longitude of three places—the United States Naval Base at San Diego, California; the Algiers Observatory in North Africa, and Shanghai Observatory, China. Up till the present time longitude calculations have been checked by means of messages sent via cables and "landlines." With the use of wireless a much greater degree of accuracy is hoped for. It will be most reassuring to hear that the experts really think the longitude of Greenwich is zero!

The Personal Touch

HAS the B.B.C. a soul? This question arises as the result of a recent query in a Sunday newspaper.

The next issue of "Wireless" will contain full constructional details of the "Monodial"—the latest in single-dial receivers. Order your copy early!

There are many who seem to agree that there is something definitely wrong with our radio programmes, but are quite unable to put their finger on the missing link, so to speak. No programme can possibly be successful if the human touch is lacking, and I am rather inclined to think that we do not get quite enough of it.

A Monster H.T. Battery

THE largest battery in existence will soon be installed in the New Jersey station, WPAP. This station now works with a motor-generator capable of giving 8,000 volts, but a battery weighing seven tons is soon to be installed, and I understand that the motor-generator will then be used for the purpose of charging it! This accumulator-operated station will then be completely independent of outside power breakdowns for long periods, until it becomes necessary to charge the little battery again.

Much Needed

THE rumour comes from France that M. Verdan, a French Post Office engineer, claims to have eliminated the



Mr. Eric Dunstan, one of the principal announcers at the London station, is stated to have been appointed General Manager of the Indian Broadcasting Company.

effect of atmospherics, and also to have accomplished secret wireless communication on the new Baudot system. I hope it is true!

CALL-SIGN.

HERE IT IS—

THE MONODIAL



THE SET THAT REALISES YOUR AMBITIONS

THIS WEEK : HOW IT WORKS.
NEXT WEEK : HOW TO BUILD IT.

SELECTIVITY, DISTANCE AND REAL ONE-DIAL TUNING

A Four-Valve Radio Press Star Receiver of high efficiency and low cost described by C. P. ALLINSON, A.M.I.R.E.



When designing a set for those who have but little skill in operating wireless receivers the primary consideration is simplicity, and for this purpose the simultaneous tuning of two or more circuits may be required, if it is to be present to the fullest degree.

The Monodial receiver is the result of much indirect as well as direct study and experiment of the subject of gang control, and in order to obtain the utmost in power and range together with ease of handling special means have had to be employed.

A Difficult Problem

The difficulties that have been encountered not only refer to the actual circuits that have been tried but also to the physical and electrical factors which are necessarily involved. Some of these difficulties will be dealt with later in this article, and should be of special interest to all those engaged in experimental work on this question.

Circuit Arrangement

In the Monodial receiver four valves are employed, consisting of a stage of high-frequency amplification, rectifier, and two stages of low frequency, and with this set it is possible to tune in a large number of stations on the loud-speaker with only one dial. It is further possible to tune out the local station and receive transmissions on fairly near-by wavelengths, and it has been found possible at a distance of only one and a-half miles

from 2LO, the most powerful of the main B.B.C. stations, to receive Dublin without any sound from the local transmission, while Hamburg and Bournemouth have only experienced slight interference.

Many special features are incorporated in the receiver, and these are

A KEY TO THE CONTROLS.

An entirely unskilled operator can work this set. Consult the photograph and note that (1) is the reaction control, which needs very little adjustment; (2) is the dial on which all tuning is done; (3) is the key to the jacks for 3 or 4 valves, and (4) is the on-and-off switch.

of great value for a number of reasons. It is perhaps needless to state that the H.F. valve employs a neutralised circuit, so that not only is complete stability obtained but also searching may be carried out with the detector valve oscillating without

serious risk of nearby listeners being disturbed.

Use of Reaction

A reaction control is incorporated, so that the maximum range and power may be obtained from the receiver. This is of the capacity-controlled type, so that the tuning of the receiver is not appreciably affected by the adjustment of reaction. Further, it is found to remain set over fairly wide wave-bands.

It was found that even with a small aerial the capacitative load transferred to the grid circuit of the H.F. or first valve is by no means inconsiderable, and arrangements have been made by means of which this may be compensated for. The result of this is that when once the gang condenser has been matched up at any point it will stay so over the whole range of the dial.

Note-Magnifying Arrangements

Two stages of transformer-coupled low-frequency amplification are employed, and by means of jacks either three or four valves may be employed at will.

Protection for the valves is ensured, so that in the event of a short occurring between an H.T. and L.T. lead no damage should occur, while the means employed is such that should a short from one H.T. + to another take place, serious results are again guarded against.

A Difficulty

Among the difficulties encountered what was probably the most important was the unequal loading of the tuned circuits. The H.F. tuned circuit has a capacity

NINETEEN STATIONS ON THE LOUD-SPEAKER!

In the course of one of the first tests the following stations were tuned in, and as a guide to the constructor of this set the dial readings are given. All tuning was done on the loud-speaker and those stations which were of satisfactory loud-speaker strength are marked L.S.

Deg.	Station.	W.L.	Deg.	Station.	W.L.
31	Stettin	241	98	Dublin	387 (L.S.)
40	Elberfeld	259 (L.S.)	100	Newcastle	404 (L.S.)
43	Bremen	277	102	Munster	410 (L.S.)
48.5	Dortmund	283	106	Glasgow	422 (L.S.)
53.5	Dresden	294 (L.S.)	109	Rome	425 (L.S.)
58.5	Sheffield	306	111	Berno	435
60	Bradford	310	114	Frankfurt	437
63	Dundee	315	116	Belfast	440 (L.S.)
66	Leeds	321	120	Leipzig	452 (L.S.)
67	Barcelona	324 (L.S.)	123	Koenigsberg	462
69	Edinburgh	328	126.5	Hull	470 (L.S.)
71.5	Hull	335	129	Birmingham	479 (L.S.)
73	Plymouth	338	132	Swansen	482
78	Cardiff	352 (L.S.)	137	Aberdeen	495 (L.S.)
83	London	365 (L.S.)	141	Berlin	504 (L.S.)
87	Prague	373	144	Unknown	508
90	Manchester	378	148	Zurich	515 (L.S.)
92	Bournemouth	387 (L.S.)	155	Rosenhugel	531
95	Hamburg	392 (L.S.)			

This test was carried out on quite a small aerial about 11 miles from 2LO. It was found that the reaction control only needed a very occasional touch to get the best results.

(Continued on next page.)

The Monodial and How it Works—continued



Wiring up is rendered very simple by the convenient lay-out of the Monodial

load on it from the aerial, while the detector circuit has another load on it due to the rectifying valve, since leaky grid condenser rectification is employed.

Although it might appear that these would balance each other to a large extent it was found that one load predominated so that when similar

original version of the final circuit. Certain modifications have since been introduced, and these will be dealt with later.

The H.F. valve employs the centretapped grid coil method of neutralisation, a scheme that I have found extremely successful. Actually, this is modified from the conventional circuit in which the centre of the grid coil is taken direct to L.T., and the reader will see from the diagram that a high-frequency choke is put in series with this lead. This I found resulted in an improvement in the efficiency of the circuit, and when several stages are used it eliminates parasitic oscillations.

In the detector circuit the use of Hartley reaction allows the same type of circuit to be employed as in the H.F. stage, a small condenser of the neutralising type sufficing to give the required control.

of about 90 degrees on the dial, it is possible to proportion the coils so that the whole of this waveband comes approximately above the critical point on the dial below which there is any risk of the matching not holding good.

Another effect of reducing the size of the inductances is to reduce their H.F. resistance and so produce an increase in efficiency. All these various considerations are, however, so bound up one with the other that in the available space it is not possible to go further into these details.

To summarise—we have in the Monodial a receiver that employs a stage of high-frequency amplification which has been tested and proved successful in many sets, and yet only one tuning control is used; not only can the gang condenser be adjusted so as to ensure both H.F. and detector circuits being correctly balanced, but

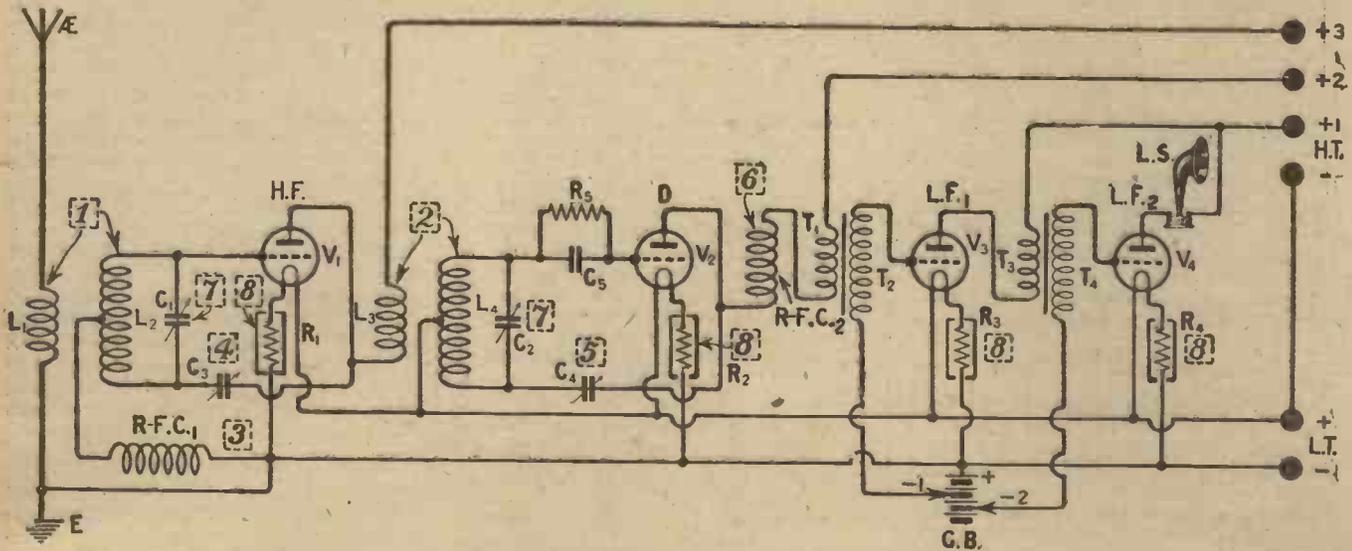


Fig. 1.—Here are the essential features of the basic circuit used in the Monodial. (1) and (2) are the matched "split secondary" coils, (3) is the "filament return" of the first grid circuit, (4) is the neutralising condenser which makes the receiver completely stable, (5) is the reaction control, and (6) is the H.F. choke which renders the design independent of the peculiarities of different makes of L.F. transformers. The two parts of the dual gang condenser are indicated by (7), while (8) is the key to the fixed filament resistances. The final refinements of the circuit will appear in our constructional article next week.

inductances and condensers were used in the two grid circuits one variable condenser tended to require rotating more rapidly than the other. The choice of a suitable circuit and the inclusion of a means for balancing the unequal load enabled this to be overcome.

Symmetry

It seemed advisable on various counts that these circuits be further made as symmetrical as possible, and the theoretical circuit diagram shows how this was accomplished in the

The Coils

In the design of the actual inductances used in the receiver due attention was paid to a fact that has been noted not only by myself but by other experimenters, that though the gang condenser may be correctly adjusted at, say, 90 degrees on a 180-degree dial, as the dial is turned below this figure the matching becomes less and less satisfactory. Since the inductances used have an extremely low self-capacity so that the 200- to 600-metre band is covered by a movement

any excessive capacitive load in the one circuit can be compensated in the other. The coils used enable a reduction in the losses and so an increase in the efficiency to be obtained, while they further provide an additional safeguard against anything upsetting the balancing of the gang condenser, while the choice of coils allows selectivity to be suited to reception conditions

Incidentally, it may be mentioned that the set is not an expensive one

(Continued on page 352.)

MULTI



RATIO

There must be a reason

why many amateur constructors do not secure perfect results from their radio receivers from the very start. Thousands have been disappointed with their first reception and have questioned the efficiency of modern broadcasting till the expense they have been put to demands renewed efforts on their part when, after further loss of time, money and temper, they stumble upon rather than achieve, something resembling perfect reception. You may be one who is disappointed, and since you have reasons of your own

for your selection of a circuit

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You will realise that perfection in the individual parts of a circuit tends to give perfection in the final result, but your choice of components

and your choice of valves

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Choose transformers that can collaborate with any valve in any circuit. With the R.I. Multi-Ratio Transformer the first cost is the last and only cost because there are 7 ratios and 4 values of impedance to secure correct operation and perfect radio reception.

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	.0005	"	18/6
Triple Gang Pattern	£3 10 0

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for full volume and outstanding purity. Ratio 1 : 5 ...16/-; ratio 1 : 3...15/-.

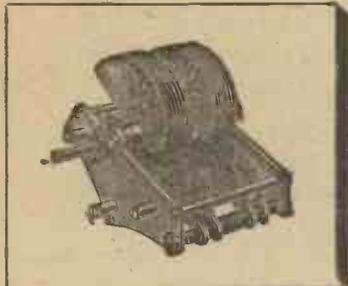
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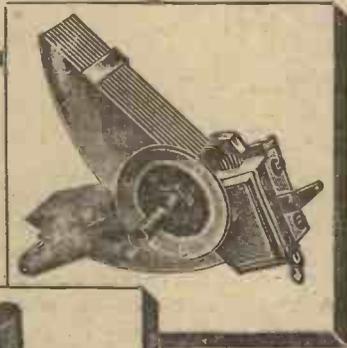
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without knob	5/-

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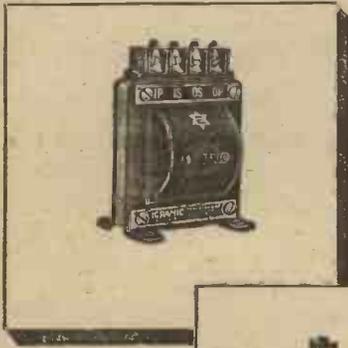
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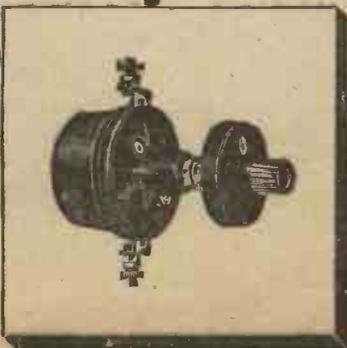
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TONE
CONTROL



HEAD OF RADIO PRESS RETIRES

Mr. Scott-Taggart's Decision to Enter Valve Business

Will Probably Continue to Write

IT will, no doubt, come as a great surprise to readers of WIRELESS to hear that Mr. John Scott-Taggart, F.Inst.P., A.M.I.E.E., the founder and head of the great Radio Press organisation, has retired in order to enter the valve business.

To those who know him, the step which he has now taken is not altogether surprising. His whole technical life has been devoted to a study of the manufacture and use of the valve. Behind the scenes he has done a great deal to assist the radio industry and valve industry, and it is only logical for him to market a series of valves bearing his name, which will carry with them a reputation which has always belonged to one who has devoted the whole of his interest to this section of radio.

It is probably news to a large

number of readers of WIRELESS that Mr. John Scott-Taggart has already been a valve manufacturer. The present time is an appropriate one to review what must be one of the most interesting and unusual careers.

Early Days

Before the war, Mr. Scott-Taggart was a keen amateur, and 13 years ago he was writing articles, although only at school. He had one of the relatively few transmitting stations in those days, and possessed the call sign LUX.

During the war, Mr. Scott-Taggart served from 1914 to 1919, first in the Seaforth Highlanders and later in the Royal Engineers. Enlisting as a private, he rapidly was promoted to Sergeant-Instructor of Signalling. He was later promoted in the field to com-

missioned rank, and was first in the results of every examination on valves held at the General Headquarters in France.

Pioneer Work on Valves

As a wireless officer in the Royal Engineers, he took part in fighting on Vimy Ridge in April, 1917, and was one of the very first to use valve transmitters in warfare. Later in the year, he became an Instructor at the 1st Army Signal School, giving courses of lectures on the valve. Although he had been engaged in active service, Mr. Scott-Taggart had written articles for *The Wireless World* in 1917, and later in the year he wrote the first article dealing in a comprehensive manner with the characteristic curves of valves. This article was entitled,

(Continued on next page.)

Mr. Scott-Taggart to Enter Valve Business—*continued*

"On Characteristic Curves and their Use in Radio Telegraphy and Telephony," and was also published in *The Wireless World*.

Although investigators in the services had, no doubt, similar information, Mr. Scott-Taggart had to investigate the whole question of characteristic curves from the beginning, and carried out a very laborious set of measurements, which formed the basis of what is one of the first real published analyses of "families" of valve curves.

Wireless Proves Its Worth

At the beginning of 1918, Mr. John Scott-Taggart joined the 55th Division, just before the battles of Festubert and Givenchy, in the La Bassée sector. On April 9, 1918, a fierce attack was made along the whole British front, and due to a flanking movement the original site of the 55th divisional headquarters was actually captured, while the front remained substantially unaltered.

The whole of the communications of the division were broken by shell fire, and the direction of operations was carried out entirely by the wireless system, which extended to the front line trenches. For work on this occasion, Mr. John Scott-Taggart was mentioned in despatches.

The part played by wireless in this division may be judged from the fact that the wireless section under his command possessed the highest percentage of decorations for gallantry of any wireless section in the British Army. Later in the year, during the final fighting, Mr. John Scott-Taggart was awarded the Military Cross for "gallantry in maintaining wireless communications under fire."

Continuous Experiment

Although not enjoying the advantages of a more sheltered technical post, Mr. John Scott-Taggart maintained the closest technical interest in valve work, and carried out much experimental work during rest periods. He also continued to write articles for the technical Press, which disclosed for the first time the great usefulness of the three-electrode valve. Professor Fleming, in his book on the valve, quoted large extracts from these articles, and in his Preface paid a very generous tribute to the original author.

During this period, Mr. Scott-Taggart developed a valve attachment for trench work which eliminated the

high-tension battery, and at the time of the Armistice, according to the statement of Colonel Trew, who was the officer in charge of wireless of the B.E.F., this valve attachment was to be fitted to all trench sets.



A frame aerial set in use in the recent Army training operations.

A Standard Text-Book

Immediately after the war, Mr. John Scott-Taggart completed a book entitled, "Thermionic Tubes in Radio Telegraphy and Telephony." It is, to-day, the standard text-book on the



Army manœuvres have been carried out in Germany this year and a German mobile wireless station is shown in this photograph.

valve, and is easily the largest book on the subject.

In 1919, Mr. Scott-Taggart took charge of valve manufacture at the lamp works of The Edison Swan Electric Company, Limited. His work was principally the manufacture of different types of valves for the

Government, and in view of the very strict specifications and the fact that every valve was rigidly tested by the Government Departments concerned, it proved an excellent training in a particularly difficult process of manufacture. It is interesting to note that the first valves specifically designed for amateur use were designed by Mr. Scott-Taggart, and were called E.S.2 and E.S.4 valves. These were different from the standard service type of valve, which was then the only one readily available to the British public.

Wide Experience

Mr. Scott-Taggart left the Edison Swan works to join the Radio Communication Co., Ltd., which, as readers may know, carries on a big business in ship wireless installations with activities in this country as regards general wireless work which are only second to the Marconi Co. Mr. Scott-Taggart became head of the department dealing with inventions and patents, and was next in seniority to the chief engineer.

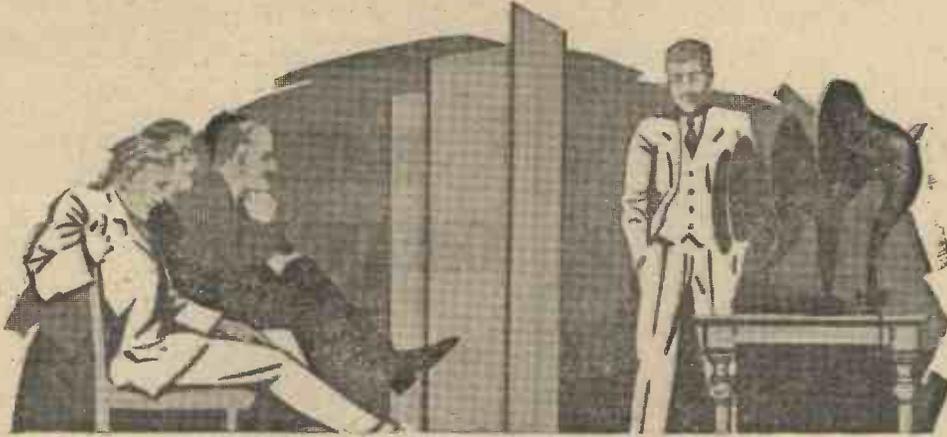
He held this position for several years, and during this time acted as patent adviser to the Mullard Radio Valve Co., Ltd., and in fact prepared the original defence in the patent lawsuit which that company had with the Marconi Co., which finally resulted in the House of Lords' decision for the Mullard Co.

The Negatron

It was during his stay with the Radio Communication Co. that Mr. Scott-Taggart's invention, the Negatron valve, was adopted for use in continuous wave reception on dozens of liners, which to-day receive their news bulletins on this ingenious valve which gives a negative resistance effect. This valve, like many of Mr. Scott-Taggart's principal inventions, has no application to broadcasting, but has valuable uses in "commercial" wireless.

Distinctions

Mr. Scott-Taggart is a Fellow of the Institute of Physics, and at the time of his election was the youngest to have achieved that distinction, which is one of the highest professional diplomas in physics. He is also an Associate Member of the Institution of Electrical Engineers, besides holding similar membership in the French, Belgian and American Institutions of Electrical Engineers. Many of his writings, including text-books on the
(Continued on page 371.)



A CONVINCING TEST

—now build your own loud speaker *this week-end*

WHEN we first offered the public a full-powered loud speaking unit for 13/6 people were frankly incredulous. "No doubt it's excellent value for the money," they said, "but you can't expect it to equal an instrument costing several pounds."

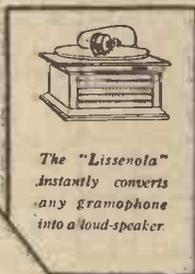
So we invited four entirely disinterested judges to sit behind a screen while we carried out a simple test. We put on a well-known and expensive loud speaker and carefully noted the quality and volume of reproduction. Then the horn was removed from it and attached to the "Lissenola" and the result again carefully noted. This was repeated with half-a-dozen expensive loud speakers. It was found impossible to say which gave the better result—the original loud speaker bases or the "Lissenola." This is a test you can also make yourself at any dealer's before you buy.

The "Lissenola" is a universal fitment; you can attach it to any type of loud speaker horn or gramophone horn, or to the tone-arm of any gramophone, and get faultless results. You can easily follow the simple instructions and full sized diagrams enclosed with every "Lissenola" and make yourself—for a few pence—a handsome full-powered horn of tested and proved efficiency, giving you a complete loud speaker equal to any high-priced senior model you can buy and saving you many pounds.

You can get a Lissen Reed (1/- extra) and adapt the Lissenola to carry any cone or other diaphragm working on the reed principle. You can, if you like, use your Lissenola with no horn at all—and still the volume will be enough for a small room.

Obtainable and demonstrated—like all Lissen Radio parts—at all good radio stores. Or direct from the makers if any difficulty. Include no postage but mention dealer's name and address.

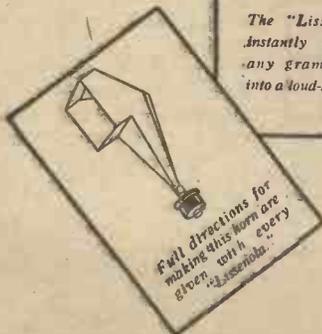
13/6



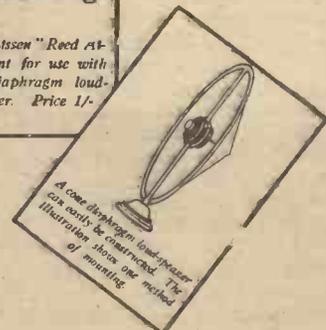
The "Lissenola" instantly converts any gramophone into a loud-speaker.



The "Lissen" Reed Attachment for use with cone diaphragm loud-speaker. Price 1/-.



Full directions for making this horn are given with every Lissenola.



A cone diaphragm loud-speaker can easily be constructed. The illustration shows one method of mounting.



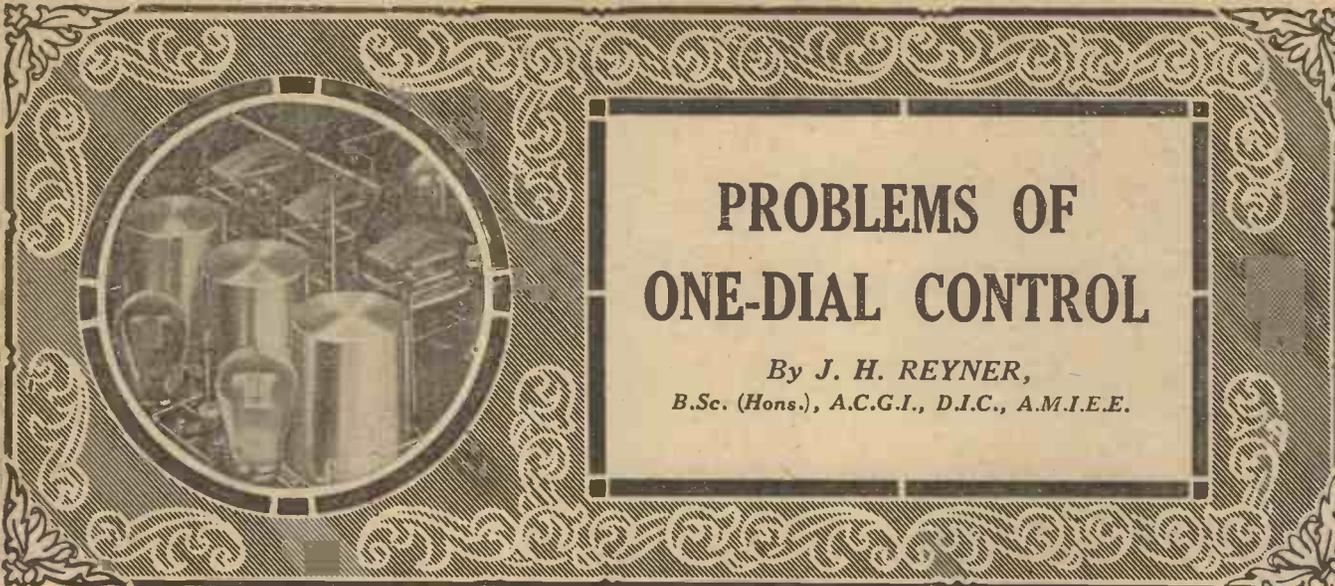
THE LISSENOLA

Hear it before you buy at your dealer's — *this week-end.*
LISSEN LTD., 18-22, Friars Lane, RICHMOND, SURREY.

Managing Director: T. N. COLE.

PROBLEMS OF ONE-DIAL CONTROL

By J. H. REYNER,
B.Sc. (Hons.), A.C.G.I., D.I.C., A.M.I.E.E.



There are many difficult problems to overcome when designing receivers in which several circuits are controlled by one dial, and in his discussions below Mr. Reyner explains how these problems have been dealt with and solutions found at Elstree.



MOST of the important developments to be made in any science are the outcome of more or less logical developments.

Usually it is easy enough to trace afterwards the various stages of the evolution, but the reverse process of course, namely that of being able to foresee developments ahead, is a different problem. In fact, it is only a comparatively small number of investigators who have the faculty of seeing ahead in this manner, and the inventor in any walk of life is usually a man who can combine this foresight with the practical ingenuity necessary in putting ideas into practice.

Early Difficulties

The idea of single control has been coming for a considerable period. Not very long ago the various tuning circuits on a receiver bore very little relation to each other. The dial settings at which the various stations tuned in were often 10 or 20 degrees different, and if any definite log was to be kept of the settings at which different stations could be obtained, then it was necessary to record the dial setting on each of the condensers in a separate column.

Attempts were made from time to time to tune two or more circuits together by placing two condensers on the same spindle, so obtaining the dual type of condenser. These efforts, however, with certain exceptions, were not attended with any marked success, and the question of

common or "gang" control was allowed to lapse.

Modern Units

As time went on, however, manufacturing methods improved, and the types of coil and condenser used in the modern circuits are of a higher order than in previous times. One of the principal results of this increased standard of efficiency is the fact that the individual units are all tolerably uniform in character. The logical result of these improved conditions

less" laboratories, with a view to finding how far a practical scheme could be devised which was simple to adjust and easy to operate. One of the first investigations undertaken was that of finding out to what extent the various dials on a multi-valve receiver *did* read together. It was found that although a reasonable similarity was obtainable, the dial readings on the various condensers agreeing within two or three degrees, yet a closer accuracy than this could not be effected without special precautions.

The Aerial Problem

The problem of the aerial dial was also another one which had to be solved, and which required settling in a different manner. The first tuned circuit has associated with it in some manner or other the capacity due to the aerial circuit. There are various methods of coupling the aerial to the first tuned circuit in the receiver, but in nearly all of them the effect of the aerial capacity is to render the tuning on the first dial different from that on all the others, and therefore special arrangements

have to be made to overcome this difficulty. This problem will be discussed later, and we will confine ourselves for the time being to the considerations of the matching of the other tuned circuits in the receiver.

The problem, of course, is enormously simplified if the circuits are identical in all respects as far as is possible. The "Elstree Six" circuit, for example, utilised the same arrangement of tuned circuits coupled to the respective valves on all the four tuned

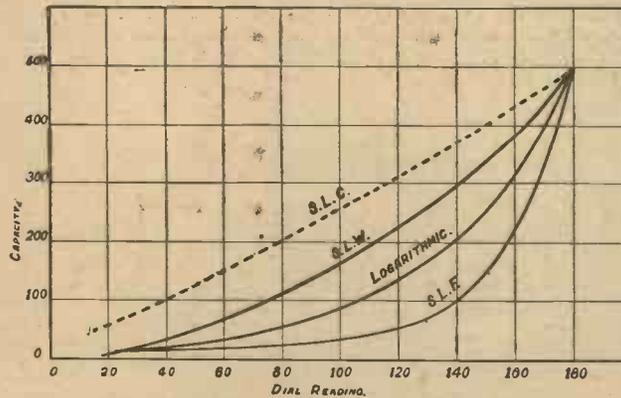


Fig. 1.—Showing the variation of capacity with dial reading for a corrected square-law plate, a straight-line-frequency and a logarithmic plate.

was that in receivers incorporating two or more similar circuits the readings on the condensers became to all intents and purposes identical. This has been increasingly the case in the last 6 to 9 months, and it has naturally revived the idea of a single control for all the various tuning circuits.

Special Investigations

The problem was therefore investigated in some detail at the "Wire-

Problems of One-Dial Control—continued

circuits. Even the last tuned circuit, that is to say, the one connected to the rectifier, was the same as the previous ones, owing to the fact that anode-bend rectification was employed, and therefore there was no condenser inserted in the grid lead which might possibly cause an unbalanced effect.

Accurate Matching

In addition to this, however, it is necessary to ensure that the components employed in making up this chain of identical circuits shall also be accurately matched. The modern variable condenser does to a large extent comply with these conditions.

There are on the market now many forms of condenser which are constructed in such a manner that a reasonable matching can be expected, even when commercial samples are selected at random. This factor is one which has contributed in no small manner to the success of the experiments in single control.

The problem of the coils is a little more difficult. It is obvious that the coils themselves must have equal inductance if the dials are all to tune in the same place. What is more, they should have the same self-capacity, which means that they should be wound in the same manner. If this is not the case, then even if the dials do match towards the upper end of the scale they will not agree towards the lower reading.

Type of Coil

A little thought will show that in order to comply with these conditions it is essential to use single-layer coils for the inductances. Such coils can be made in such a manner that they can be produced commercially as matched inductances. Using a single-layer winding on a former of a given diameter, and having a given winding length, it is possible to turn out coils which are all fairly accurately matched, and which therefore would be suitable for use in the circuits employing a single control.

It so happens that single-layer inductances are also the most efficient, and the tendencies in recent design have been towards the adoption of single-layer solenoids for tuning coils. We are therefore enabled to utilise the standard types of coils, with perhaps certain slight modifications in order to make the matching as accurate as possible in the gang-control arrangement.

Preliminary Tests

Some preliminary experiments were therefore made, utilising single-layer inductances and carefully-matched condensers, in order to see whether satisfactory single-control could be obtained. It was found that with commercial apparatus the arrangement was still not satisfactory. By commercial apparatus I mean types of construction which can be considered practical propositions from commercial points of view. Thus, it would be possible to match up two inductances by very careful measurements, and by adding on or taking off single turns at a

tion was still found to be necessary. There may be differing lengths of leads in the various tuned circuits. There may be slight differences in inductance due to the proximity of different metal objects and matters of that sort. In any case it was found that a small correction of perhaps one or two degrees was necessary in the majority of cases.

This, therefore, led to the second stage in the experiments, which was confined to the production of suitable balancing devices to enable the various tuned circuits to be brought into line. Various methods were tried, such as the placing of a small parallel capacity across each of the tuning condensers and setting these verniers in such a position that the circuits were all definitely in tune at some point about the middle of the scale.

Capacity Correction

It was found, however, that this method did not give satisfactory correction over the whole of the scale, and that further adjustments of these balancing condensers were necessary at either the top or bottom of the scale, or both. Moreover, it can be shown by theoretical consideration that such an arrangement as this is not very satisfactory.

Another arrangement tried was the introduction of very small balancing variometers in series with the actual tuning coils. It can be shown that theoretically such a method of balancing would give a true balance over the whole of the scale. This method, however, was ultimately abandoned because it was difficult to place both the coils and the variometers in such a position that no unwanted interaction took place between the various circuits.

This problem of interaction between the circuits, of course, is more important where there are two or more stages of high-frequency amplification. With only a single stage the question is not so serious, and the problem of gang-control is considerably simplified, since there are only two circuits to be tuned. In these investigations, however, the problem was considered from the point of view of the general case involving an indefinite number of tuned circuits.

Condenser Adjustment

The method which was finally adopted and found to be most satisfactory was the simplest of all, and consisted in adjusting the settings of
(Continued on page 343.)

G-5UW



The transmitting apparatus at G-5UW, the British amateur station owned and operated by Mr. F. J. Singleton of Wolverhampton. Power for this station is derived from the electric lighting mains.

time and so on and so forth. This would not be a satisfactory proposition from a commercial manufacturing point of view, and neither would it be suitable for construction by the average amateur.

The ordinary wireless enthusiast has not the facilities for such careful and accurate matching, and if the success of the receiver depended on such methods it would not have a very popular appeal. By confining ourselves to the considerations of methods which are commercially practicable, we incidentally obtain types of construction which are within the means of the average amateur should he desire to make up his own coils or other components.

Correction Necessary

Reverting to the experiments, however, it was found that with such straightforward and simple constructions some further measure of correc-

I HAVE BEEN ASKED . . .



I am experiencing a somewhat unusual difficulty with my set, a high-pitched whistle and distortion being present, which is sometimes accompanied by a booming noise, which gradually grows until signals are drowned. The booming noise has been obtained from time to time since I constructed the set, but only latterly has the whistle been present.

Probably a high-tension battery which has run down and has developed a high internal resistance is responsible for the distortion and whistling you mention. When an H.T. battery has passed its useful life and developed a high internal resistance, this latter serves to "couple" the valves, and will permit oscillation at low frequency to take place. This latter is denoted, in many cases, by a high-pitched whistle, and also by distortion. The remedy here is obvious. Some relief may, however, be obtained in certain cases by shunting the H.T. battery by large Mansbridge condensers of two microfarads or more.

The booming noise of which you complain is probably due to your valves being somewhat microphonic. This trouble is often more pronounced if the loud-speaker stands upon the same table as the set, and in such cases is generally cured by removing the loud-speaker to a remote part of the room. In other cases a jar starts the trouble, which builds up through the sound waves from the loud-speaker setting the valve electrodes further into motion, the electrodes vibrating still more until the booming noise drowns all signals. Standing the set upon a felt or rubber pad and the employment of suitable anti-vibratory valve holders should allow you to overcome this latter fault.

My house is situated half-way down a fairly steep cliff, and the aerial is taken from the top of this latter to a bedroom in front of the house. The resulting aerial is quite good, although screened, of course, from one direction, but my difficulty is with the earth. The soil is extremely dry, and no amount of watering will give me a good earth. How best can I overcome this difficulty?

In your case a counterpoise arrangement, which may consist of a length of wire, approximately as long as the aerial if space permits, should be utilised. If you can so arrange matters it is best to support the wire at 5 or 6 ft. from the cliff-side, insulating it in the same manner as the aerial and bringing it into the house through a similar lead-in tube. If, however, circumstances do not permit of this

the H.T. battery should last longer. The correct adjustment of grid-bias voltage should be made with some care; too small a voltage allows grid-current to flow, and thus introduces a certain amount of distortion on strong signals, whilst on the other hand too much grid bias will cause the valve to work towards the lower bend of its characteristic curve, again introducing distortion. If the makers' characteristic curves are consulted, a suitable voltage is that slightly in excess of the mean voltage obtained between the zero grid voltage axis and the end of the straight portion of the curve to the left of this line. For example, if on consulting the curve for a given H.T. voltage it is found that the grid voltage between the zero ordinate and the beginning of the lower bend of the particular curve is represented by 12 volts, then the grid-bias voltage may be somewhat over 6 volts.

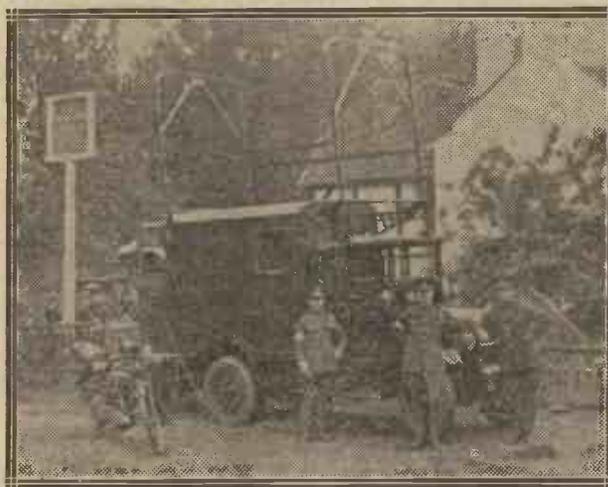
I have constructed a supersonic-heterodyne receiver, employing a split-frame arrangement giving reaction, and utilising a separate oscillator. Results are poor, only the local station being heard, and there is no noticeable difference when the oscillator valve is removed. Can you indicate where the fault is likely to lie?

It would appear likely that your oscillator valve is not functioning, and that the first detector is working as a combined detector and oscillator, which is quite possible since you have a reaction arrangement into the frame circuit. I would advise you, therefore, temporarily to cut out the reaction arrangement into the frame circuit, whilst confining attention to the oscillator valve circuit. Try the effect of reversing the connections to the plate coil of the oscillator, whilst making absolutely certain that the oscillator valve legs make good contact in the valve socket. Experiments should also be carried out with the H.T. voltage of the oscillator valve, and in this position types of valves which oscillate readily should be tried.

I have recently obtained a set of screened coils in order to construct the "Magic Five" set and find that terminals do not correspond in position with those shown in the original diagram. How shall I proceed?

Owing to the fact that all screened coils have been standardised recently an alteration in position of the terminals on the bases has taken place. The coils are so wired that leads which originally went to a given letter or number, still go to the same letter or number, and in wiring up, therefore, the numbers and letters should be followed exactly.

ARMY ACTIVITIES



A mimic battle recently took place between 10,000 troops in the Hampshire area. Radio played an important part and our photograph shows an experimental van which was used.

being done, an insulated wire, weighted and thrown over the cliff, should be quite effective.

If you have a garden on the side of the cliff, surrounded either by an iron fence or by one of wire-netting, etc., it may be found that a connection to the fence or wire-netting will form quite a good counterpoise, and such an arrangement is always worth while trying.

I have recently altered my set to employ grid bias, but have not obtained the expected increase in signal strength. Why is this?

The object of utilising a grid-bias battery is not to obtain an increase in signal strength, which should not be expected, but it should allow you to obtain better reproduction, and also

PROBLEMS OF ONE-DIAL CONTROL

(Continued from page 341)

the various condensers on their spindles. It is well known that, in a receiver containing several tuning dials made up with circuits reasonably similar, if the dial readings to start off with are not the same, a very good correction can be obtained by tuning in to a certain station about the middle of the dial, and actually adjusting the dials, keeping the condensers fixed, so that the dial readings are identical. If this is done then it is found that the dial readings remain similar within a degree or so over a large portion of the scale.

The Final Solution

The method finally adopted in correcting the minor errors which arise in the construction of a gang-controlled receiver, was to rotate the spindles of the various condensers comprising the gang condenser, so that they were each individually tuned to a particular station at a point about the middle of the scale. The spindles could then all be locked up solid, so that the rotation of the knob caused all the condensers in the chain to rotate in unison, and this correction was found to be reasonably good over the whole of the scale. By reasonably good, I mean that large numbers of stations could be tuned in without any readjustment, although it is probable that all the circuits were not quite in tune at certain portions of the scale.

If this problem is investigated theoretically it can be shown that for a correction of this nature to be adequate it is necessary to employ condensers obeying a logarithmic law. I discussed the relative merits of S.L.F., S.L.W. and logarithmic condensers some time ago in these columns, and it was shown therein that the type of plates to give a logarithmic law was something in between the square-law and the straight-line frequency.

The Ideal Condenser

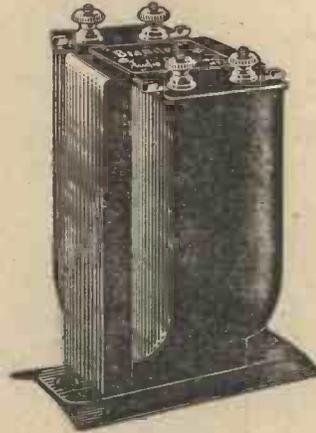
For the purposes of this correction, therefore, neither the S.L.W. (square-law) nor the S.L.F. plates are correct, one being on one side and the other on the other side of the ideal shape of plate. Practical experience, however, shows that for all practical purposes, either of these types of plates is reasonably satisfactory. The figure attached shows the variation of capacity with dial reading for a corrected square-law plate, a straight-line-frequency and a logarithmic plate. It will be seen that the logarithmic plate lies in between the two, and that either the S.L.W. or the S.L.F. plates will give approximately correct results at any rate over a large portion of the scale. Of the two it appears that the S.L.W. plate would give the better correction.

(To be concluded.)

EXPERTS IN RADIO ACOUSTICS SINCE 1908

JUST TO REMIND YOU

WHEN you're wanting "pukka" telephones for long range work, don't forget that Brandes Matched Tone are still far and away the best. And if you are building, the 1st and 2nd stage Brandes Transformers are admirably efficient. Look at the prices!



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The Brandes 1st stage Transformer has a high voltage amplification ratio of 1-5. This, together with a straight line amplification curve, means that the amplification is constant over a wide band of frequencies, thus eliminating resonance.

Ratio 1-5 (black case).

The 1-3 Transformer amplifies over speech, pianoforte and harmonic ranges equally well. Mechanically protected and shielded against interaction. Terminals and outside soldering tags.

Ratio 1-3 (brown case).

17/6



MATCHED TONE HEADPHONES

The whole secret of Matched Tone is that one receiver refuses to have any quarrel with its twin. Ably schooled in these generous sentiments by our specially erected Matched Tone apparatus, their

synchronised effort discovers greater sensitivity and volume and truer tone. There is no possibility of the sound from one earpiece being half a tone lower than its mate.

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Announcing

A GREAT

IN this, the first announcement of the new S.T. series of valves, I would, as the designer, like to make some preliminary remarks.

I have for several years watched valve development very closely, noticing the advantages and disadvantages of every type and every process. When I decided to enter the manufacturing field myself, I resolved to combine the best features of existing valves with my own ideas. The Company of which I am now managing director has acquired a licence under all the leading patents which have contributed to valve development in order that we shall not be hampered in any way in producing the best. Although this has added to the manufacturing cost and minimises the profit, I was not prepared to place a valve bearing my name on the market unless it represented the highest technique in valve manufacture and design.

While head of the Elstree Laboratories, my duties included the technical criticism of existing valves and acquiring an intimate knowledge of their respective advantages and limitations, and I would not have produced a series of valves unless I believed they would stand out above others.



John Scott-Taggart, F.Inst.P., A.M.I.E.E.

THE

S

FOR STRENGTH

NEW VALVE

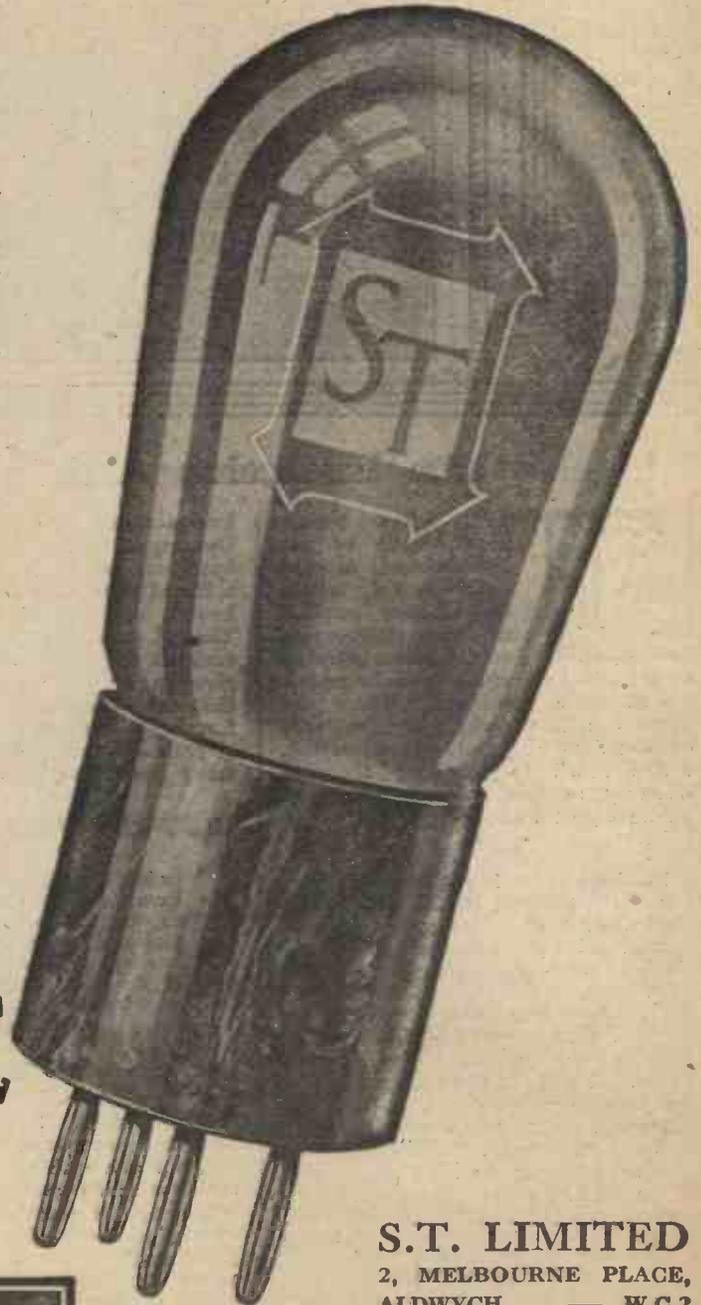
IT is because I feel acutely that my technical reputation is staked on these valves, that I propose—having satisfactorily established the design and manufacture—to satisfy myself that *each* valve is within the necessary specification, and then to initial every carton to certify that the valve is fully up to standard.

In launching a new valve, no risks can be taken. The valve you buy will have been tested under my personal supervision—a laborious task—but then the whole business of S.T. valves will be run on personal lines. I do not believe in treating valves as a species of electric lamp or as so much merchandise. Every valve I sell, every valve you buy, is a valve in which I shall retain a personal interest. Each valve is designed for a specific purpose, although the series have many merits in common. I have aimed at a high mutual conductance, a large filament operating at a very low temperature, and taking a minimum of current, a long life for the valve, a high vacuum, a big factor of safety in every direction, robustness, and absolute uniformity. The S.T. valve is strong, entirely non-microphonic and foolproof, but is built like a chronometer.

Types and prices to be announced shortly.

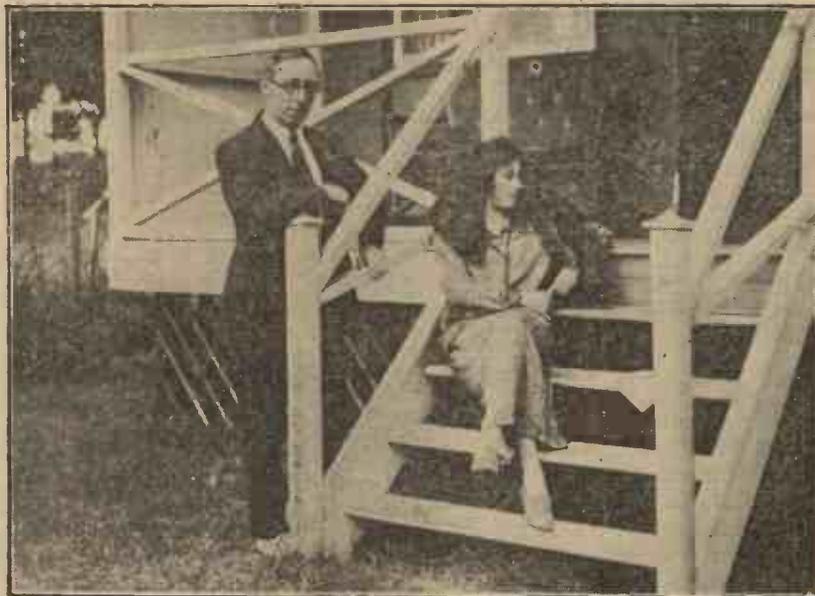
John Scott Taggart

T
VALVE
AND TONE



S.T. LIMITED
2, MELBOURNE PLACE,
ALDWYCH — W.C.2

Why I Chose Radio



An Exclusive Article by JOHN HENRY



I HAVE often been asked, both by my friends and in the hundreds of letters which have reached me from listeners-in, why I chose wireless as a method by which to make myself known as a comedian. There are various reasons why, in the very earliest days of popular broadcasting, I determined to turn my thoughts seriously to this particular form of public entertainment.

Exciting!

In those days I was working in a Government office, in the department that dealt with wills in German. Of course, some of you may be able to think of an occupation which is much drier than dealing with wills in German, where one needs a fair knowledge of both languages—and also bad language—before one can get along at all. It was the more fascinating to me because previously I had been a theatrical comedian, and once a man gets the greasepaint into his blood and gets used to playing for the applause of an audience—well, he rather prefers to remain an actor than become a king.

His Opportunity

Therefore, when radio first loomed up as a great factor in modern civilisation I decided that it would offer a big chance for me to get

known again as a popular comedian. One night, in the beginnings of wireless broadcasting, I was listening-in on a friend's set (Joe Murgatroyd's, you know), and I heard a comedy turn. Then I said to Blossom that if I couldn't do better than that I should give up trying altogether. Just at that time the B.B.C. were talking of forming a number of small companies of artists for radio work, although not many people in this country knew

In this special article the well-known dialect comedian tells us why he chose radio as a medium, and gives an insight into how it feels from his side of the microphone which may surprise some of his readers considerably.

much about it. I happened to have had some experience in America, so I got in touch with the B.B.C. at once, and was given an engagement.

Whether it was because I chose a type of humour quite different to the sort anyone else was giving, or whether because I was so desperately keen to make a success, I don't know, but anyway my "Yorkshire" stuff made a hit. As things developed, I realised more and more that radio was going to

become a very big influence, and decided to specialise in it, and let my old idea of getting back to the stage rest awhile.

A Hard Life

One of the first things I discovered was that the life of a radio comedian was very little, if any, easier than that of a vaudeville artist, though it also was wonderfully enjoyable. But the laughter-maker labours under a good many difficulties from which the average broadcaster doesn't suffer. For example, whereas the musician and the singer have hundreds of people constantly submitting new numbers to them, and thus enjoy a great choice of material from which to choose in the interests of their public, the poor comedian has to go about with a long face, poor lad, thinking of fresh jokes all day. You know I sometimes say—"John Henry calling; I don't know what I'm to say, but—" and so on? Well, that's terribly near the truth. When next you meet a sad-looking man bumping along absent-mindedly in the street, don't jump to the conclusion that he's in love, or a Scot who's heard a saxophone bang in the near distance. Because it's probably me, wondering what to say at my next concert!

A Radio Difficulty

Again, I found that there was one difficulty regarding the radio joke

WHY I CHOSE RADIO

(Continued from previous page)

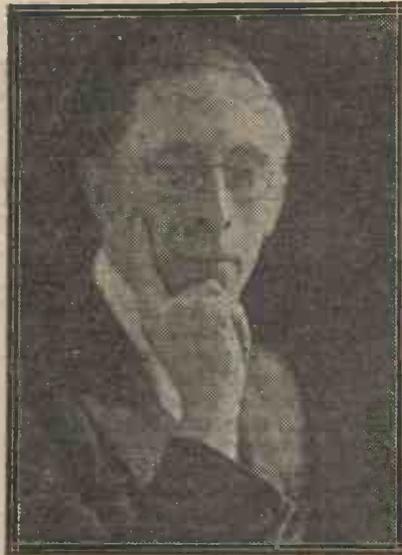
which was even worse than being on the boards. At different towns a man can tell the same stories without fear, but once he's told one on the wireless it's in everybody's mouth; and, as he reverences chestnuts, he can't tell it again anywhere. Old songs and music gain in popularity every time they are heard! The poor comedian has no friends, no one writes jokes out for him (indeed, perhaps his life would be more miserable than ever if people did!). Folk won't let him repeat himself—but come, John Henry, if you go on like this you'll break down. It's all wrong, ah tell ye, it's all wrong!

A Desperate Resource

That phrase—"It's all wrong!"—and one or two similar ones are about all I dare repeat by radio. Stop! there is one other thing—the threat to sing the Wheelbarrow Song. Not that I often have to sing it, the threat being enough as a rule; but, anyway, it is one thing that helps me out of many desperate situations.

Ah, the letters and entreaties I get about that little classic of mine! People write begging me to sing it (either morbidly because they want to hear it, or because they want to be

made low-spirited). Others write telling me that if ever I carry out my threat they'll place the matter in the hands of the N.S.P.C.A. Some folk write to inform me that I'm the scandal



A recent portrait of Mr. John Henry.

of the B.B.C.—others that they have never heard a better laughter-maker in the course of their long lives. One man wrote to me saying that his Missis's Maternal Parent had died of laughter on hearing me, and

what was I going to do about it? Oh, of course, you won't believe that, because there's a low-class stock joke remotely connected with it. I will not assure you it is true—I will merely retire upon my dignity.

The Reason Why

You may be wondering what all this has to do with my reasons for choosing wireless humour as a career, and my idea in keeping on broadcasting after the painful incident referred to. It's just this: that I'm still playing to an audience, only to a greater audience than ever my wildest dreams of stage work could conceive for me. If a man can't keep away from the theatre once he's had a taste of it, how much less can he keep away from the theatre where the biggest audience of all awaits him—the broadcasting studio? That's why radio keeps on dragging my footsteps towards Savoy Hill. Though why the public puts up with it, I don't know.

And I love doing humorous work, because, for all its difficulties and trials that I've told you about, yet there's a wonderful thrill in knowing that you've got the chance of making millions of people laugh, and teasing them out of their troubles for a while. And then—oh! there's Blossom calling me ag-ain. Ah'm afraid ah'll ha-ave to go.



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J. W. G., Atkinson Road, Fulwell, Sunderland:—"I am delighted with the results, I did not think my set could do what it does with the Eliminator instead of dry cells. The increase of volume is great and no trace of hum whatever."

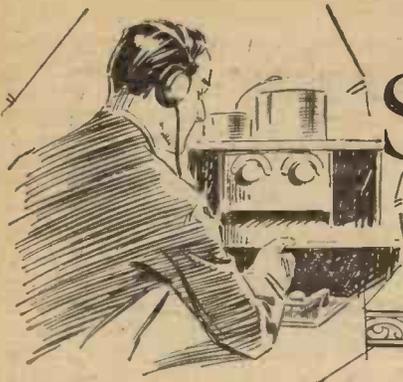
Mr. H., Market Street, Kirkby Stephen:—"We have had several which have given every satisfaction."

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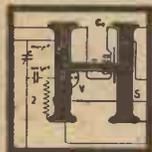
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SHORT-WAVE

Notes & News



HAVING "put back the clock," we are beginning to feel what may be called the "winter sensation" in short-wave work. Nearly all the old-stagers have come back to the 45-metre wave-band, and the early fade-out, now occurring at about 8 p.m., has returned once again.

Useful Work

On the whole, there now seems to be much more real experimental work being carried out between stations about 1,000 miles apart, and less of the sheer striving to cover the greatest possible distance, than there was last year. This is, of course, only natural, since everyone knows now that it is easy enough to set up "DX records" on these short waves, but much more difficult to keep up reliable communication over the whole twenty-four hours with any given station.

At present, it seems very doubtful whether it would be possible to name one definite station in any country that is audible for the whole of the day and night. Even our next-door neighbour's signals, figuratively speaking, seem to select one particular hour at which to disappear completely.

The Antipodes

The United States stations are, at the time of writing, extremely weak, or even inaudible, until after midnight. What happens at about 3 a.m. the writer is not in a position to say! At 5.30 to 6 a.m., however, the Australians and New Zealanders seem to make themselves heard as strongly as ever, and there are certainly more of them working this year than have ever been heard before. One enthusiastic listener in the North of England reports logging 55 Australians and 42 New Zealanders to date!

The Low-Power Tests

British transmitters are already beginning to "super-tune" their apparatus in readiness for the forth-

coming low-power tests, arranged by the T. & R. section of the Radio Society of Great Britain. The chief trouble in connection with these tests is likely to be interference from foreign stations. Perhaps they will themselves reduce power, but the idea of a French station using both raw A.C. and low-power seems rather unlikely! That, of course, is one of the chief troubles of the short waves. In the 200-metre days, even, any serious interference was almost certain to come from the "chap next door," and it was comparatively easy to ask him to stop transmitting, if one had any special test on. Nowadays, however, he

frained from calling "CQ," but the condition on the back of the transmitting licence states that *no general call* is allowed. The P.M.G. apparently looks upon the familiar "test" as such, and more than one transmitting amateur has received a letter pointing out that he is not, by the terms of his licence, allowed to call "test." What, then, is he to call when he wishes to signify that he does not wish to work with any particular station, but wishes to receive reports from any distant station that may be receiving his signals? It seems that a special call for amateur use which, while not being regarded as a "general" call, would still produce the same effect as a "test" call, is what is needed at the present time.

Twenty Metres

20-metre work seems to have stopped almost completely at the present time. Plenty of stations may be heard between 20 and 25 metres, but all these that are not commercials are harmonics of stations working on the 40-50 metre wavelength! Is 20 metres to be purely a "summer" wavelength?

Fading Effects

The writer has been taking some observations recently upon the fading of signals on the same wavelength, but from different directions and distances. So far as it has been possible to judge, there is no fixed rule that can be laid down at present. On one occasion two stations,

D-7JS at Copenhagen and I-1AU at Turin, were both fading exactly "in step" with one another. On another day G-6KO (Forfar) and GI-5GH (Belfast) were fading apparently with quite independent periods, while the "mush" that could be heard underneath them both seemed to synchronise itself with the variations of the Irish station. More observations are being taken in connection with stations at greater distances.



The apparatus owned by Mr. E. S. Strout, Junr., an American amateur, with which he successfully communicated with the Byrd Polar Expedition after the recent historic flight across the North Pole.

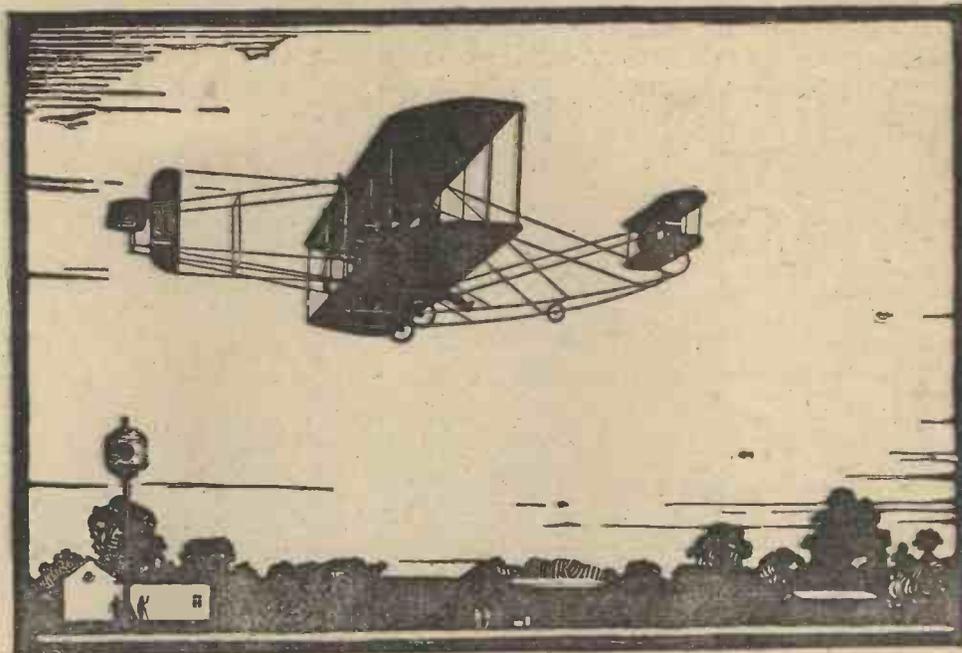
may transmit without our being in the least disturbed, while another man, safely tucked away at a distance of 500 miles or more, can ruin a large section of the ether as far as we are concerned, without even being aware that we exist!

The authorities have taken steps, though, to reduce all possible interference to a minimum during these low-power tests, which are to take place between 11 p.m. and 6 a.m.

The "Test" Problem

The question of "general calls" and G.P.O. legislation has cropped up again. The amateur has always re-

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In 1910

In 1910 arose the problem of designing condensers for aircraft wireless sets.

The glass Leyden jars of those days were too bulky and too fragile, and there was no other suitable condenser made.

Thus it was that William Dubilier turned his attention to the subject and commenced his pioneer experiments. He immediately realised that to design a condenser which should be compact, unbreakable, and at the same time efficient under the high frequencies and voltages of wireless circuits would call for much specialised research.

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denser to meet these requirements. Its dielectric was Mica.

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And the possession of such condensers is essential to good results whether you build a crystal set or conduct laboratory research.

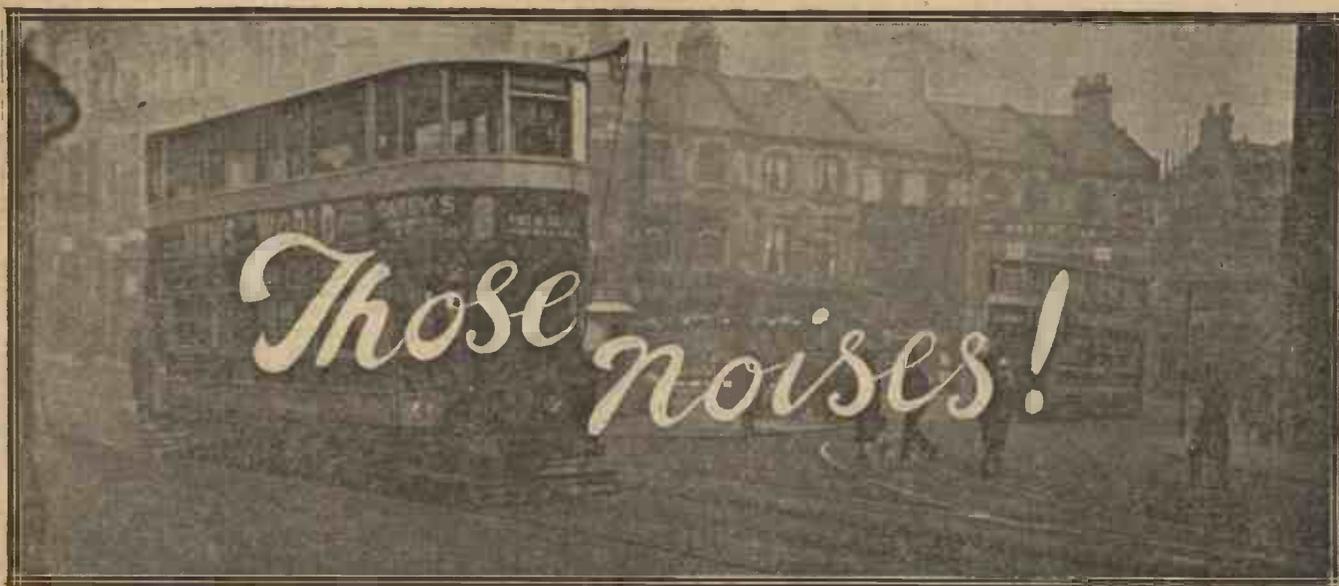


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E.P.S. 229



By Captain JACK FROST, M.I.R.E.

Have you ever experienced those crackling noises which creep in and mar broadcast reception? In this interesting article Captain Jack Frost explains how various sources besides well known ones can account for such troubles.



NOISES which creep into and over that favourite item, and which from time to time mar broadcast reception, are, and always have been, a real "bogey man" to the listener to wireless transmissions. Whether the listener be an enthusiast technically or an enthusiast from the entertainment point of view, he occasionally feels like breaking something when that nasty noise jars upon his ears.

Unfair!

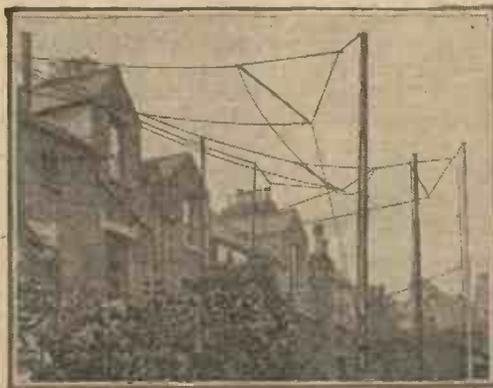
Upon the majority of occasions atmospherics suffer the blame, where, as often as not, it is not "static" at all which is responsible for the disturbance. I well remember an instance. A friend of mine asked me to listen at his flat to a peculiarly annoying noise which took place at approximately the same time each evening. When we had listened for a time and had enjoyed upon his two-valve set excellent reception, quite suddenly the noises commenced. They were of the crackling, scratching category; you know the kind of thing that I mean? They might easily have been mistakenly put down as originating in a dud high-tension battery, or a loose or dirty connection. In fact, lots of people might have called them atmospherics, for until one knows exactly the sound of atmospherics they can easily be mistaken.

At first I suspected his H.T. battery, but found that, in testing all connections and those between cells, it was none of these things. His earth was to a water pipe which came from the

main and his aerial was an inside one along the ceiling of the dining-room, for he dwelt in a ground-floor flat.

The Solution

Presently I fancied that, between the broadcast items, I heard voices engaged in conversation. It was correct enough; there were two people talking. One said to the other, "That's a better point, much better; the cats-whisker must have moved." So that was the cause of the noises! The dweller in the flat above that of



Interference may be caused by your neighbour adjusting his crystal while broadcasting is in progress.

my friend had his earth affixed to the water pipe, too, and that was, of course, connected to the same main as ours. His aerial was an inside one and was situated immediately above that of my friend, and the result was evident! As Mr. First Floor adjusted his cats-whisker he made and broke the current flowing via his 'phones, broadcasting being in progress at the

time. This caused interference with my friend, Mr. Ground Floor, via his badly screened aerial and through the earth which was common to both parties.

Not Unusual

I have known this kind of interference to happen before, and in less obvious circumstances. Two people whom I knew lived in adjoining houses and both had outdoor aerials stretching down their gardens. The aerials were nearly parallel and only about 12 feet of air space separated them. They both had their "earth" fixed to the water pipe, and, finding that they were interfering with each other during broadcasting hours, used the medium which enabled this interference to take place for the purpose of speech together. Thus they were talking to each other between items, passing their opinions upon the quality of that which they had just heard. A very bad practice that, because Mr. Listener, who lives in a neighbouring house and who happens to be listening at the time, might hear something which he is not intended to hear and might descend in wrath upon the "innocent" heads of the offending parties!

Some Other Causes

A bad case of interference once occurred in the Midlands. An overhead electric power supply cable was erected across some fields to a factory. People listening-in in the vicinity used to receive clicks and a regular tap-tap and could find no cure. The source of the trouble turned out to be

an earthing system at the factory, at which water was drip, drip, dripping and forming an intermittent earth contact.

Electric trams can be a source of trouble, too, at times if you happen to live very near to a tram route. The aerial and earth of the receiving set picks up radiated waves from the system and an audible note in the form of a series of cracklings is heard in the 'phones, varying in loudness with the nearness of the source of the disturbance. In several cases of this type of interference which I have met broadcast listening was an impossibility, the noises being easily mistakable for atmospherics. A good way of getting over such troubles, in some cases, although it is not one which always effects a definite cure, is to put a small condenser in the earth and aerial leads. Even this may not get rid of the noises, for the receiving set may pick up actual radiated waves. If that is the case, the only real remedy is to move!

Don't!

We have all heard of interference caused by oscillation. It is quite possible to interfere with one's neighbour's reception and not to know that it is being done. There is a point in the operation of reaction at which no howl or shriek is perceptible to oneself, whilst all the noises of the inferno will be heard by listeners within a five-mile

THOSE NOISES!
(Continued from previous page)

radius. If, at this point, any variation of tuning in your set occurs, and even the swaying of your aerial may be sufficient to cause this, a shriek will be heard in your own set, which is, of course, also heard by those other sufferers. Much has been said elsewhere on this subject, and to deal fully with it would need an article unto itself.

Morse Troubles and Others

Morse interference from ship and land stations may be, on occasions, "tuned out" by more efficient adjustment of one's own set. The powers that be are dealing with offending encroachers upon broadcast wavelengths; improvement has certainly been effected and greater improvement is anticipated in the future.

Interference by one's own receiver with its own reception is possible by

Our next issue will contain full constructional details of the Monodial, the latest Radio Press star set. Order early.

reason of the closeness together of both receiving set and loud-speaker. They should be well apart—at least 5 to 6 feet.

Discretion!

Last of all, and not by any means least, come our old friends, the true atmospheric disturbances. When they are about you will have no trouble in recognising them, for they sound like breakers dashing upon and washing over a shingly beach, with the shingle composed of broken glass. You can do nothing to get rid of them. If the sounds are so loud that they blot out or mar your reception of your local station's programme, then shut off your receiver; not forgetting to earth your aerial, and wait until the electric storm which is probably connected with a real storm as we know it has passed over. That is the very safest thing to do. Switches which enable you to earth your aerial are a sound investment, but fix them outside of the house if you can possibly manage to do so. The odds are all against your being affected by a charge of lightning, but in case you are, well, "safety first" you know. Keep it outside of your dwelling and do your earthing outside rather than indoors, even though it may mean that you have to nightly "fag" outside into the rain and cold to put the switch over from one position to the other. It might pay you handsomely if, and it is an "if," lightning ever pays your abode a visit.

A Word About RESISTORS & RHEOSTATS

RESISTORS: Generally speaking, modern valves require little or no change in the voltage applied to their filaments in order to obtain maximum results under all conditions. It is therefore possible and practical to use fixed resistors in order to control the current supplied, thus economising in initial cost and also in space occupied in the receiver. A further advantage in the use of Resistors is that the valves cannot be accidentally overrun as in the case of turning a Rheostat too far.

Burndept Resistors are made in a variety of values and by their use it is possible, within reasonable limits, to operate practically any valve off any accumulator. In order to use a different type valve it is only necessary to insert a suitable Resistor.

RHEOSTATS: For those who prefer to use Rheostats we offer the renowned Burndept range. As in the case of Resistors, there is a Rheostat to suit every occasion, from No. 754 with a resistance of 2 ohms to the Burndept Super Dual Rheostat, with which you can operate any valve from any battery (up to 6 volts). Apart from the fact that these Rheostats are made to operate smoothly and minimise wear, they are designed to carry sufficient current to provide the needs of the most extravagant valve.

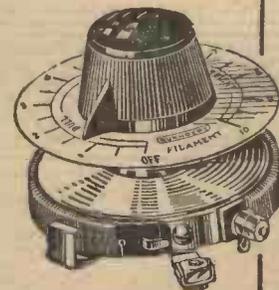
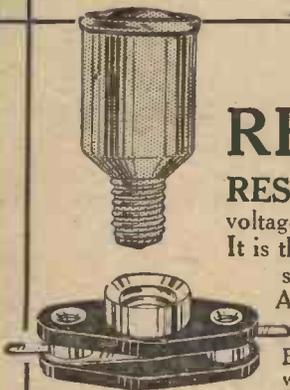
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AMATEUR BUILDERS A SPECIALTY.
J. TOOMEY, 137, Riversdale Rd., Highbury, N.5. Carr. paid.

The Monodial and How it Works

(Continued from page 334)

to build, while it is extremely neat and compact. The panel, in fact, is only 14 in. x 7 in.

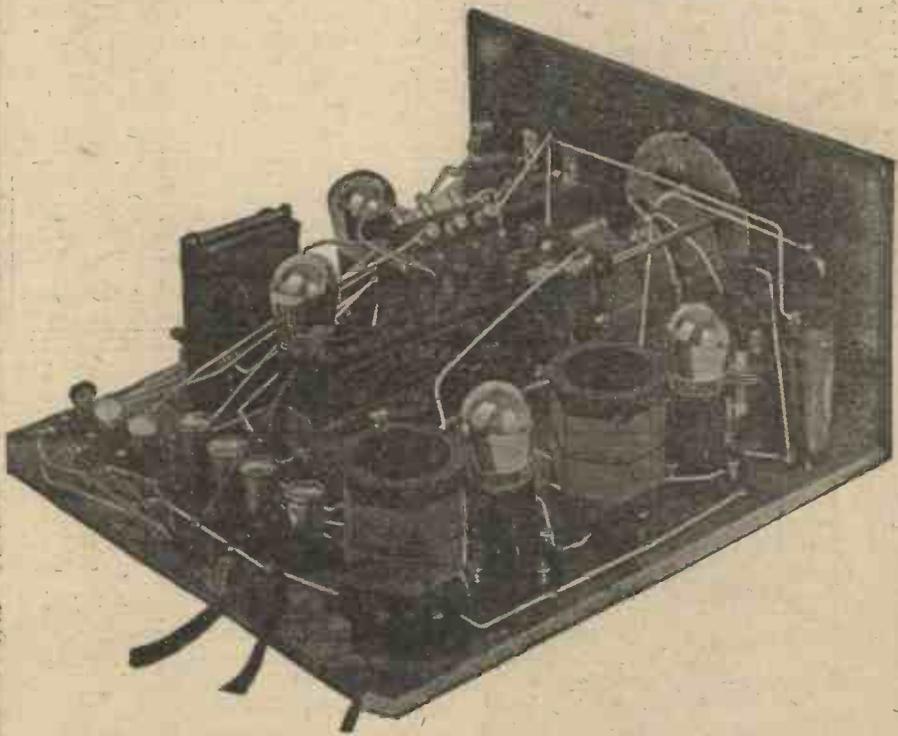
Last, but not least, of the difficulties experienced in the final design of this receiver was the question of its size. Obviously this must not exceed that of any ordinary four-valve receiver, and yet certain requirements have to be allowed for.

When it is realised that the panel size is only 14 in. by 7 in. it will readily be seen that it was not too simple a task to plan a satisfactory and electrically efficient lay-out which would allow all the necessary components to be disposed of without

couple the H.F. valve to the detector. The signal, therefore, enters the set, so to speak, at the left-hand corner at the back and travels down the left-hand edge till it reaches the panel. Then, after rectification, it passes to the L.F. side of the receiver, which, as is usual in receivers, is on the right-hand side. The first low-frequency amplifying valve is placed behind the transformer (an R.I. multi), which is used as a first-stage coupling.

L.F. Switching

The signal next passes through the second-stage transformer and so comes



Here is a view of the internal arrangement of the Monodial as it appeared during its first tests. Note the convenient grouping of the filament resistors along the back of the set. No terminals are used for the battery connections, multiple flex leads serving the purpose.

crowding. As will be seen from photographs of the interior of this receiver, it is by no means cramped for space and it has even been found possible to include a grid-bias battery for the low-frequency amplifying valves on the baseboard.

Aerial and Earth

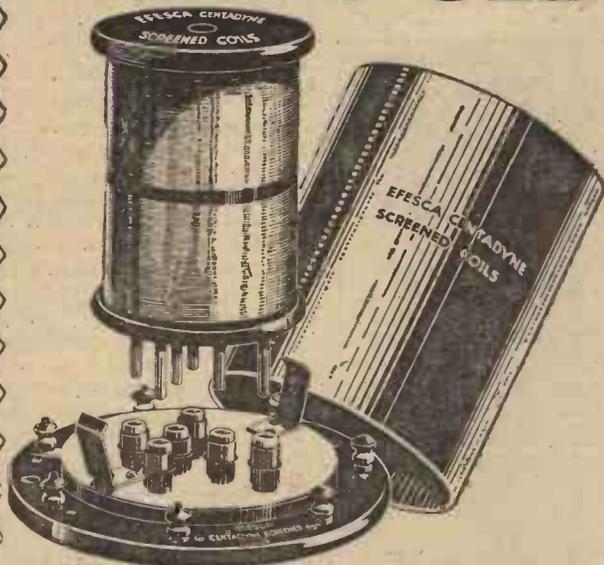
Flexible leads ending in spring clips have been employed for the aerial and earth leads, and these will be seen at the left-hand back edge of the baseboard. The coil or transformer, which is seen in this position, is employed to couple the aerial to the H.F. valve, while a similar transformer is used to

forward again to the second low-frequency amplifying valve, the output from which is available from the second jack. The first jack is connected so that telephones or loud-speaker may be connected in the plate circuit of the first L.F. valve, while when the plug is transferred to the second jack the filament of the last valve is automatically lighted and the loud-speaker placed in the plate circuit of this valve, which is now functioning.

A switch placed in one of the low-tension leads enables the set to be left adjusted and switched on and off at will.

(Continued on page 369.)

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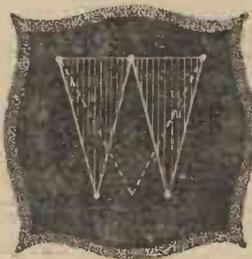


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It has been the aim of Six-Sixty right from the beginning to produce not just one type of specialised valve with unique characteristics for use with, say, a 4-volt accumulator, but a complete range of valves designed to meet all existing requirements.

Duo-triangular filament suspension



After extensive research, Six-Sixty produced a special filament which, when operating at its rated voltage, showed absolutely no sign of "glow," and required barely 1 amp. to give perfect results. The success achieved with this filament led to further research, resulting in the famous Six-Sixty Duo-Triangular system of Suspension. The combination of these two developments ensured increased electronic emission, consistently perfect reception, longer life and lower running costs. Six-Sixty, not content to rest on their laurels, worked incessantly until these advantages were made generally possible to the wireless enthusiast, irrespective of whether his L.T. supply was 2, 4, or 6 volts.

Briefly, this is the story of the new Six-Sixty Point One Valves—valves which bring hitherto undreamed of advantages within the reach of the General Radio Public.

It is interesting to note that Messrs. A. J. Stevens & Co. (1914), Ltd., have decided, after exacting and exhaustive tests, to standardise Six-Sixty Valves in their famous "Symphony" Range of Receivers.

S.S. 2A, H.F. and L.F.
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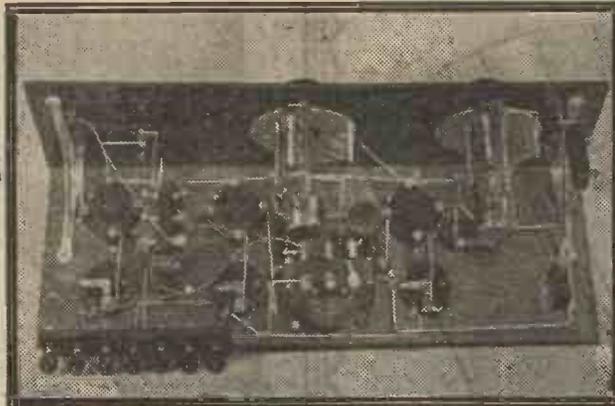
The Electron Co., Ltd., Triumph House, 189, Regent Street, London, W.1.

"30 to 3,000 METRES"

Full operating details for the three-valve set described last week

By

L. H. THOMAS



How the components are arranged on the baseboard of the "30 to 3,000 metres" receiver.

Notes on valves, coils, short-wave working and the use of a counterpoise.



THE receiver described in last week's issue of WIRELESS seems to be extremely

simple to operate once the tapings on the L.F. transformers have been placed in a manner suited to the valves in use. There are, however, one or two points that need attention.

The Series Condenser

First, if a very small aerial is in use, greater signal strength without appreciable loss of selectivity may be obtained by substituting a somewhat larger condenser for the .0001 series condenser originally specified. One of .0003 may be used, or, if an indoor aerial is used, it may even be dispensed with altogether.

Valves

Best results were obtained with valves of the following types:—Detector, high-impedance resistance-capacity type; first note-magnifier, medium-sized power valve; last note-magnifier, a power valve of very low impedance (of the order of 4,000 ohms or even lower).

With these valves the transformers were arranged as follows: First, primary between P0 and P2, secondary

between S0 and S2; second, primary between P0 and P1, secondary between S0 and S2, or sometimes it may be found to work better between S1 and S2.

STATIONS RECEIVED ON LOUD-SPEAKER

Daventry	Rosenhugel
London	Brussels
Bournemouth	Berlin
Madrid	KDKA
Hamburg	WGY

Coils

If a Gambrell "O" centre-tapped coil or its equivalent is used, 2L0 is received well towards the top of the

scale. With a "D" or equivalent coil 2L0 may come just at the bottom of the scale or may be off it altogether. However this may be, the .00025 condenser was found sufficient to "cover the gap" between the two sizes of coil.

Short Waves

For short-wave operation it has been found slightly advantageous to use a long counterpoise instead of an earth. The counterpoise should, of course, be insulated almost as well as the aerial itself. The .0001 condenser in series with the aerial may be found rather on the large side. Should this be the case, it may be replaced by a neutralising condenser of fairly large maximum capacity. This may then be adjusted to the best value, i.e., one which gives good signal strength and yet permits the set to oscillate fairly freely.

Curing "Overlap"

Should the reaction control become at all "ploppy," an adjustment of the H.T. and L.T. values will generally put things right again. Sometimes, however, one is apt to forget that a valve has recently been changed, and a different value of grid-leak may be required to cure the trouble.

The writer experienced no trouble of this kind at all, the control being astonishingly smooth.

No. 48.

Gentlemen Prefer Wireless!





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BEFORE you buy a Loud Speaker ask these questions: is it pure in tone?—is its volume adequate?—will it reproduce evenly and accurately, music and speech alike?—will it still retain these qualities after years of use?

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is not necessary. An instrument which has risen in a few years from a small "local" sale to World-wide fame; which has found its way into the homes of people of every nationality; and whose name has come to be universally regarded as a veritable synonym for perfect Radio reproduction—a Loud Speaker with such a record of achievement behind it surely needs no further recommendation,

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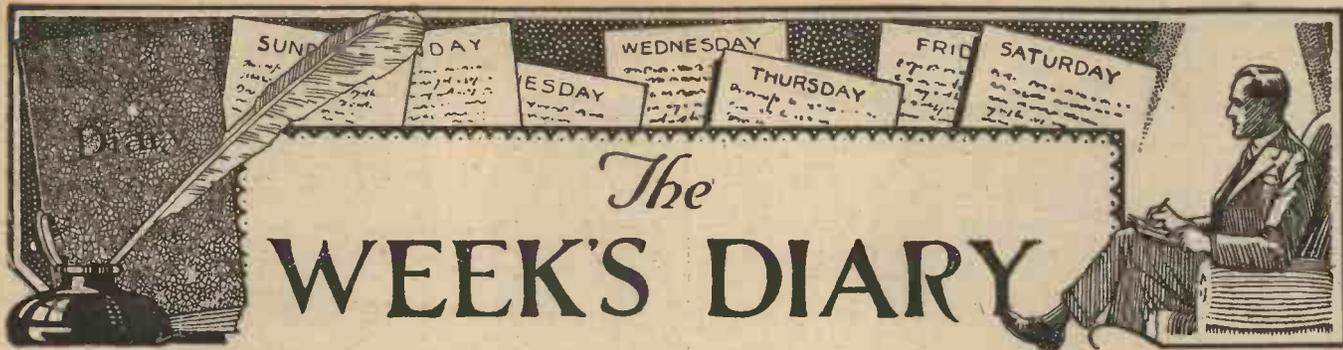
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E.P.S. 266.



The WEEK'S DIARY

THE way in which television is progressing now reminds me very strongly of the first attempts at telephony, and the admiring way in which they were regarded by those who were able to understand them! Just as we look back with amusement at the first attempts to produce really excellent speech, we shall probably look back to the year 1926 in ten years' time and smile at the weird attempts at pictures that were then being transmitted, although we now regard them as quite good efforts!

THE second Radio Tournament and Tattoo, broadcast on Saturday, October 9, was, I think, by far the most ambitious "sound broadcast" that the B.B.C. has yet attempted. The experts behind the scenes (or should I say "behind the noises"?) were really great on one or two occasions; I should very much like to see the apparatus they used. I am told that it consisted chiefly of trays, tins, kettles and horns.

I DISCOVERED a few days ago the exact components of that attractive material known as "erinoid," which used to be very popular in the form of condenser scales, before dials came into general use. I don't think I shall be accused of giving away trade secrets when I tell you that it is composed of—condensed milk and potatoes!

A NOVEL use of the principles of the loud-speaker is reported from the United States. Inhabitants of Philadelphia were amazed one day to hear a gigantic voice booming out from behind a bank of clouds; a few moments later a small twin-engined biplane appeared. This plane is equipped with a microphone, a special multi-stage amplifier and a loudspeaker designed to project practically all the sound downwards. We may now

think of future speeches "re-layed" by this means to the whole population of a town! Alternatively, one has awful visions of Somebody's Pills being advertised in this way.

man was the very first of its kind; it was broadcast chiefly in the hope that captains of ships at sea should pick it up, as it was believed that the man in question was on his way out of this country. Scotland Yard, of course, has its own telephony transmitter working on 700 metres, but I should not be surprised if we continue to hear occasional broadcasts like the one I have referred to, since 2LO has, so to speak, a much larger circulation than the Scotland Yard station.



Mr. John Harrison Hartley has won for the third year in succession the first prize for the best home-made set at the Radio World's Fair in New York. Our photographs show the prize-winner and the 9-valve superheterodyne with which the trophy was gained.



I HAVE always thought that more co-operation between the B.B.C. and Scotland Yard might often make things a trifle easier for the latter establishment. The recent broadcast of the description of a "wanted"

I WAS very sorry to hear of the death of Mr. Walter Benson, who for a long time was musical director of the Aberdeen station. He was killed in a motor-cycle accident on the South Deeside Road. His influence at 2BD will be greatly missed.

ALL this talk about listening for signals from Mars on October 27, when it is "in the most favourable position for signalling to the earth," strikes me as being utterly illogical. If Mars can radiate signals sufficiently strong to reach us when the distance between the two planets is 42,600,000 miles, why on earth (or on Mars) couldn't the same signals reach us almost equally well a fortnight or so beforehand, when this distance is only increased by 1 per cent. or 2 per cent.? The Martian Broadcasting Company will have to increase the power of its main stations!

THE increasing use of D.C. and A.C. mains for providing both H.T. and L.T. is having a great "cheapening" effect upon radio. One or two of the modern "H.T. eliminators" give 10 milliamperes (quite a good average value for a three- or four-valve set) for 500 hours, for the cost of 1d. Compare this with the ancient batteries that one reckoned to have to replace every three months or so!

The Week's Diary

(Continued)

A HINT that I gave recently in these columns has been fulfilled. Mr. John-Scott-Taggart, one of the leading valve experts in this country, and certainly the best known, is giving up his directorship of Radio Press, Ltd., in order to manufacture and market a new valve. This will be rather sensational news to the average experimenter and listener, who for many years has looked for guidance on valves, valve circuits, valve designs, to one who has written more on the subject of valves than all other authors put together.

Mr. Scott-Taggart during the last few years has built up an extraordinary goodwill amongst the wireless public. Nearly all modern development in radio circuits owes a debt to Mr. Scott-Taggart's neutralised circuit invention. We feel sure that he will

this is too much to hope for," or some similar nonsense. They have had the "Solodyne," and here is the "Monodial." I wonder when they will be satisfied?

* * *

AN announcement has appeared just recently in the German Press to the effect that the Hertzogstand station, in Bavaria, will work with a power of 1,000 kilowatts! Although I think an extra large pinch of salt may be taken to help this statement down, I have no doubt that the Germans are out to break records; ample proof of this is the way one can run round all the German stations with a "D. and mag." set. I myself have had no less than seven of them on the loud-speaker with a set of this type!

WAVE-TRAP.



* * *

Mr. Henry Lytton, whose name is inevitably called to mind at the mention of Gilbert and Sullivan, is himself an enthusiastic listener, and is here seen enjoying a programme from 2LO

* * *

carry with him the good wishes of all our readers.

AT last you will be able to satisfy your curiosity about the "Monodial." Preliminary details of quite a generous nature are given in this issue of WIRELESS, and full constructional details are, of course, to follow. I have no hesitation at all in telling you that it is something quite different from all other four-valve sets; it really has one dial only—not one dial and three knobs, all tuning controls! It is cheap and a real "DX-getter." It is selective and incredibly easy to work. What more can be said about a set?

INCIDENTALLY, why does the "lay Press" keep on writing stuff about "the ideal wireless set still to come"? I was reading a long article a few days ago; the writer kept on repeating, "What is wanted is a multi-valve set with one control only, but

AMATEUR TRANSMITTING NOTES

QRA's Found

G-2SU: M. Eskdale, 330, Manchester Road, Bradford, Yorks.

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SMSL: Hudiksvalls Radioforening, Hudiksvall, Sweden.

I-1GN: Ing. E. Gnusetta, Via Donizetti 45, Milan, Italy.

Z-2BP: W. N. Macklin, 75, Wai-papa Road, Hataitai, Wellington, N.Z.

BZ-6QB: J. M. A. dos Santos, Rua Senador Chermont, S. Luiz do Maranhao, Brazil.

BZ-9QA: Paira Collegio Militar, Fortaleza, Ceara, Brazil.

QRA's Wanted

BZ-9QH, LA-1SE, YS-7WW, D6N, D-7XU.



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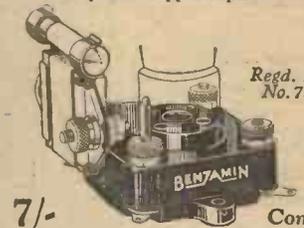
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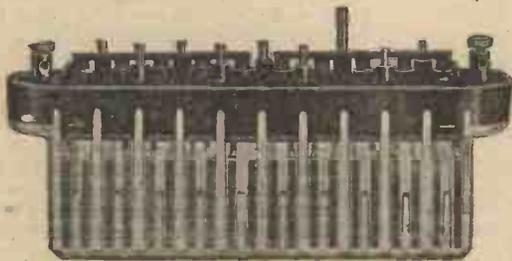
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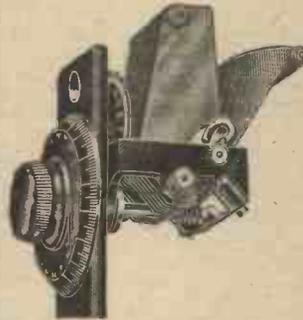


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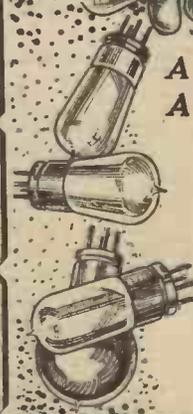
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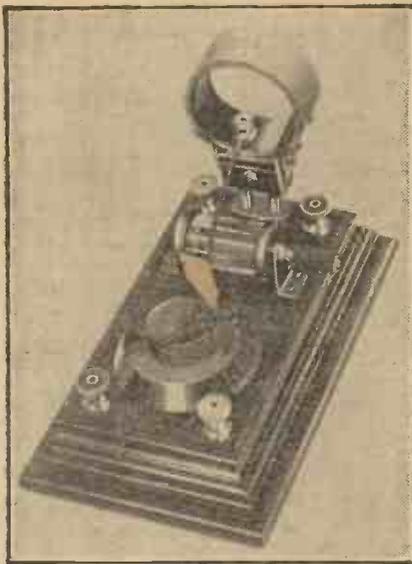
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Frelat



IT may still safely be said that, as regards crystal receivers in entirely unskilled hands, the simpler the set the better the results. The instrument about to be described in this article is therefore extremely simple in both construction and theory. In addition to this, the set is neat and compact, being approximately 5 inches by 8 inches by 2 inches "over-all" dimensions. It could, in fact, be conveniently used as a paper-weight upon a study desk and at the same time provide a neat and

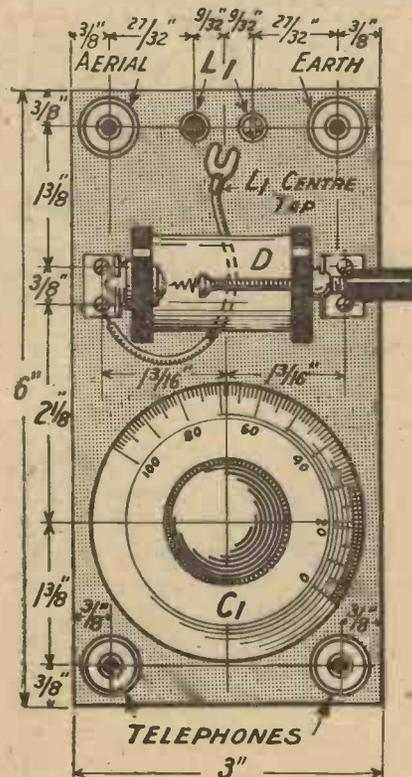


Fig. 1.—Mark your panel out to conform with the dimensions given in this drawing.

A "PAPER-WEIGHT" CRYSTAL RECEIVER

By H. BRAMFORD

A neat crystal set with very few constructional requirements which can be used, as its name suggests, for a paper-weight.

useful little adjunct to anyone's table. The materials actually used for construction are tabulated on this page. It is advisable to adhere to this selection, as each item has been particularly chosen for the purpose for which it is intended.

Construction

It will be seen from the front of panel diagram that the constructional

WHAT YOU WILL NEED

- One moulded base. (Camco.)
- One panel measuring 6 in. by 3 in. by $\frac{1}{8}$ in. (Trolite.)
- One crystal detector (micrometer adjustment). (Burndept.)
- One coil plug and socket for panel mounting.
- One variable Dial-o-denser .0005. (Portable Utilities, Ltd.)
- One fixed condenser .0001. (Dubilier.)
- Four triple purpose terminals (aerial, earth and phones). (Eastick.)
- Glazite for wiring. (L.E.W. Co.)
- Small piece of insulated flex.

work is particularly simple. The first process is to drill the panel in accordance with the dimensions given in this

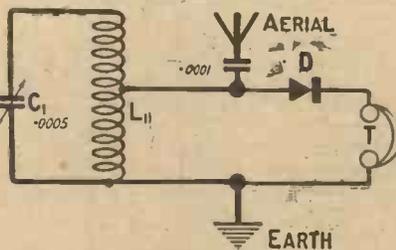


Fig. 2.—The theoretical circuit diagram of the "Paper-weight" crystal set.

drawing. A template which is supplied with the crystal detector will make the mounting of this component a simple matter. All the components are mounted from the front of the panel, and the correct method of mounting the variable condenser is given with this component by the manufacturers.

With the work of drilling and mounting accomplished, it only remains to make the various connections, as is clearly shown in the back of panel diagram. This drawing is practically self-explanatory, and shows

the extreme simplicity of the wiring. The moving element of the variable condenser, which is represented by the flexible lead, connects to the earth

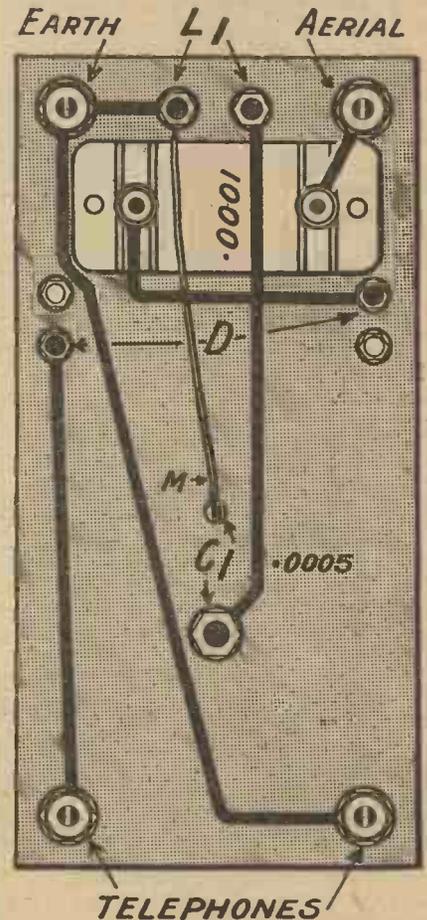


Fig. 3.—Since all connecting points are provided with nuts or terminals, the wiring can be carried out without resorting to soldering.

terminal, as shown, sufficient play being allowed for the lead when the dial of the condenser is rotated.

The Circuit

The theoretical circuit diagram is shown in Fig. 2, which makes it obvious that the receiver is constructed upon the simplest possible lines. A plug-in coil L_1 , of the centre-tapped type, is used for the aerial tuning in. (Continued on next page.)

A "PAPER-WEIGHT" CRYSTAL RECEIVER

(Continued from previous page)

ductance, which is tuned by the variable condenser C₁. One side of the crystal detector is taken by means of a flex connection direct to the centre tap of the coil itself.

Operation

To operate the receiver, connect up the aerial, earth and 'phones to the terminals indicated as such in the diagram. Plug a suitable centre-tapped (No. 60 or 75) coil into the socket provided for this purpose upon the panel. Rotate the condenser dial, commencing from the reading 0°, until signals are heard. Adjust the detector to its best point and re-tune with the variable condenser until signals are at their best. Once the receiver is thus set it should remain so for a considerable period.

Author's Results

The receiver was tested upon an indifferent aerial some six miles east of 2LO. Using a No. 75 plug-in

centre-tapped coil, the local station was easily received at remarkably good signal strength. Daventry was received with good results, using a No. 250 plug-in coil (home-made with centre tap). The set proved to be extremely selective, tuning being sufficiently critical for crystal-receiver reception, this being due to the fact that the detector is tapped midway upon the aerial coil. This arrangement, it was

insulation of the screws where they make contact with the brackets of the crystal detector is removed, as in some cases this detail leads to loss of signal strength. The brackets may also be cleaned where they make contact with the crystal cup and the adjustment arm.

IN ADVANCE

October 24.

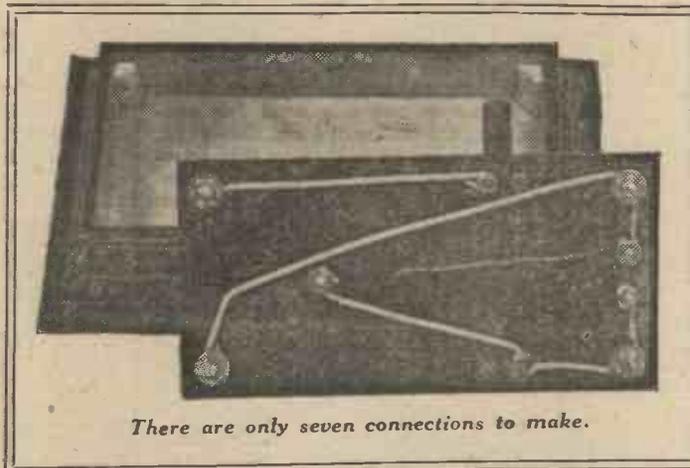
- 2LO: "The Hound of Heaven."
- 5WA: Religious Service in Welsh.
- 2ZY: Recital by Dale Smith.

October 25.

- 2LO: The Old Inns of London.
- 2ZY: Grand Orchestral Concert.
- 5WA: Schubert programme.
- 5SC: Bizet Anniversary.
- 2BE: "A Country Cottage" Fantasy.

October 26.

- 2LO: Chamber Music.
- 5IT: "Sleuth 'Ounds," by Birmingham Radio Players.
- 5SC: "The Ambition of Annabella Stordie."
- 2BD: Ballad Concert.



There are only seven connections to make.

found, resulted in no apparent loss of signal strength.

A Remark

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SOME READERS' VIEWS

An Enemy of Jazz

SIR,—Much as I was interested by the article by Mr. de Groot in a recent issue, I fear that I cannot agree with one of the statements that he makes. His actual words are: "But by giving more and more music to the world, radio is helping all of us who have the love of real music at heart."

I have had a radio receiver now for three years. I have calculated that about 60 per cent. of the programmes consists of jazz and other music that is not fit to listen to. How does radio help me?—Yours truly,

C. R. JAMES.

Surbiton.

Why Not More British Music?

SIR,—The title of Mr. de Groot's article in last week's issue was, "How Radio is Making Music International." I suggest that you should publish an article dealing with the possibility of popularising *British* music. The bulk of broadcast music at present is American.—Yours faithfully,

L. M. BEARD.

Scarborough.

An Appreciation

SIR,—May I be permitted to express my appreciation of Mr. J. H. Reyner's excellent series of articles on "Secrets of Modern Radio Efficiency"? They succeeded in explaining several points that had been worrying me for some time past, and I am sure that they could not have been more clearly written.

Incidentally, may we hope to see screened coils even more widely used in sets described in WIRELESS in future?—Yours faithfully,

JOHN H. HUNTLEY.

Stockport.

Those Wavelengths

SIR,—I should be glad to know if, and when, the B.B.C. propose to bring the new wavelengths into use? WIRELESS has for some time been expatiating upon the undoubted benefits that will arise from the new scheme, but the scheme seems to be as much of a dream as ever. Can you not use your influence to speed the changes up a little?—Yours truly,

M. H. LEACOCK.

Forfar.

[ED. NOTE.—The proposed changes are not confined solely to the B.B.C., but affect all the European stations.]

NEXT WEEK.

MORE ABOUT THE MONODIAL

Constructional details and reports of tests

Why Not Place a Standing Order With Your Newsagent?

Tungstone 60 volt High Tension



TUNGSTONE THE ONLY HIGH TENSION IN THE WORLD USING ONLY PURE LEAD for Grid and Paste. As pure lead is the only metal that will generate and store Electricity by chemical conversion the natural sequences are that the pure Lead Plate and the Lead Oxide Paste have a natural affinity to harmoniously grow together into a homogeneous plate. Amongst the many advantages secured is the reduction of the deadly disease of sulphation to an absolute negligible minimum of risk.

TUNGSTONE THE ONLY HIGH TENSION IN THE WORLD that does not need or use any Wood or Rubber Separators between each Plate. All other makers are compelled to use Separators to keep the Paste in the thin Plate. Separators create excessive Heat, Fire and Explosion risks, Internal Resistance. Impurity of Acid caused by decaying Wood always creates crackling or parasitical noises in Phones and Loud Speakers and eventually the premature breakdown of the Plates.

All makers of Low Tension (except Tungstone) use Celluloid Containers containing Camphor which the Acid quickly attacks, creating impurity of Acid causing Frothing and Foaming and also detrimentally affecting the Electrolyte which in turn lowers the amp. hour efficiency.

TUNGSTONE H.T. FIRST CHARGE IS FREE AND TO FULLY RE-CHARGE every three months costs only 2/-. Can be re-charged in a few hours. T.A.63

Entirely of British Origin and Workmanship. Patented and Trade Mark Registered in the Chief Countries of the World.

TUNGSTONE ACCUMULATOR CO., LTD., St. Bride's House, Salisbury Square, London, E.C.4

Build Your Own LOUDSPEAKER WITH A LISSENOLA OR BROWN A and our COMPONENTS. You can construct your self a handsome PAPER DIAPHRAGM type, or CONE type LOUDSPEAKER in half an hour for less than it would cost you for the ordinary cheap horn type Loudspeaker. You will obtain VOLUME, CLARITY, and unsurpassed tonal quality. Prices, particulars and Diagrams for stamp. TRADE inquiries invited. Tell your dealer **Goodman's, 27, Farringdon St., E.C.4** (Tel.: City 4472.) Also obtainable from Spencer's Stores, 4-5, Mason's Ave, E.C.2

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Radio Micro Power	Fama D.E.
3v .1 amp. - - 10/9	2v .2 amp. - - 4/-
3v .3 amp. - - 9/6	M.R., D.E.
Radio Micro D.E.	3v .06 amp. - - 5/6
3v .06 amp. - - 7/-	Polo 60-volt Batteries
Fama D.E.	3-volt Tappings
4v .06 amp. - - 5/9	Guaranteed - - 7/6
Fama Power	
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Want a better Set?

YOU can have one and listen while you pay! We supply any Radio Press Set on a system of easy payments. Our technical advice is yours for the asking. Send for Catalogue "W" to:

New Times SALES CO., 71, CITY ROAD, E.C.1.

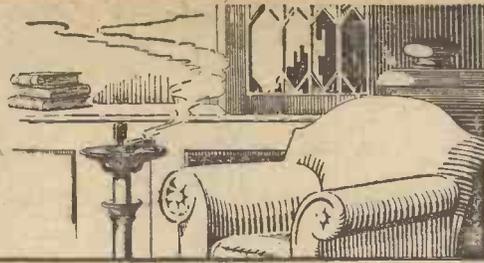
LITTLE WIRELESS GADGETS

THE VERNON, 6d.; Postage, 1d.

MAP Co., 246, Gt. Lister St., Birmingham.

From my Armchair

BY EARL RUSSELL.



In these columns Lord Russell expresses each week his own personal views on matters of interest to "Wireless" readers.

Baseboard Construction

My instincts are rootedly conservative; I did not take up bridge instead of whist for three years, and was about the same length of time behind everyone else in taking up auction bridge, and so it happens that I am only now having my first experience of baseboard construction. I have to admit at once that it has immense advantages. The time occupied in attaching the components is certainly not more than one-fifth of that taken to work in ebonite, and does not require anything like the same degree of skill.

In addition to that, the material is cheaper, and mistakes, if any, are more easily rectified. The best material is American white-wood, and in order to get the maximum insulation this should be dried and then treated with paraffin wax worked in with a hot iron, but not, of course, hot

enough to burn the paraffin. This means a temperature considerably below that of the domestic hot iron as used by the housewife.

Modern Components

Of course, this method of construction has only been rendered possible by the numerous convenient modern components, which are self-insulating. What with coil bases, large but inexpensive valve holders, and the like, the path is made easy for the constructor. I have not, however, the highest opinion of a pair of aluminium brackets priced at 2s. They were beautifully shaped at the fitting edges, but one of them was half-an-inch on

Start Building the Monodial Next Week

the skew. Condensers, clips and bases of various sorts are also available for every purpose, and it looks to me as if the ebonite panel itself would soon be extinct.

Headphones

I begin to fear that I must have a thicker head than most, because of the complaints I am always seeing of the distress and inconvenience of wearing headphones for a long time. I do recollect that in earlier days I once padded the bands at the top, but I never find it worth while now. The real trouble I used to find was pressure on the ears, which actually caused irritation, but now I always use those rubber ear-pieces and I find no difficulty in wearing 'phones for hours at a time. Two other points to make sure of are that they should be expanded so as to fit the head properly and that the length should be right for the ears. Light-weight 'phones are, of course, an additional advantage.

What Do You Do?

THE recent plebiscite taken by an experimenter in Jersey was rather interesting. It revealed the fact that 50 per cent. of the listeners in the island listened to Bournemouth and Daventry equally, 33 per cent. to Bournemouth only, and 17 per cent. to Daventry only. We should be very interested to receive similar reports from other parts, or even from single towns.

Makes short circuit impossible



The "Peerless" JUNIOR Rheostat

An OFF position is provided, while definite stops make short circuit impossible. Resistance element is immune from damage. Will safely carry current of two valves. Complete with nickelled dial and one-hole fixing. Three types: Size 1 1/2" diameter, 1/2" high, 6, 15 or 30 ohms. Price only

2/6

From all dealers or direct: THE BEDFORD ELECTRICAL & RADIO CO., LTD., 22, Campbell Road, Bedford.

THE BEST IS THE CHEAPEST

in the long run.

THE GUARANTEED "SERVICE" RECEIVERS. A TWO-VALVE LOUD SPEAKER SET. Absolutely complete, Valves, Coils, H.T. and L.T. Batteries, Aerial and Earth Equipment and Loud Speaker. £13 Cash or deposit of £2 : 12 : 0

For FREE Demonstration, Installation, and Upkeep, — See our Catalogue, FREE on application.

Wireless Specialists.

The Service Company Ltd. "SERVICE" — Our Name and Aim.

Wireless Dept.

273-274, HIGH HOLBORN, LONDON, W.C.1

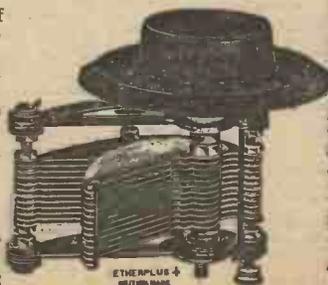


S.L. FREQUENCY CONDENSER

This is an instrument of precision with a low minimum capacity and an adjustable self-centring ball race and cone bearing. It gives an even distribution over the whole range.

No. W/180 .0005 12/- each (with 4" knob dial)

From dealers or from M. & A. WOLFF, 9 - 15, Whitecross Street, London, E.C.1.



Just select your programme ELECTONE does the rest.

Choose the items which appeal to you, note the times at which they commence and arrange your plugs on the face of the Electone at the corresponding times—that's all. No unwanted items, no annoying switching off and on. Electone does it all—automatically. Without Electone your set is incomplete. Incidentally it saves nearly 50% on accumulator and H.T. battery current, thus really doubling the life of the valves. Ask your dealer to demonstrate.

PRICE 27/6

"Electone" is a Handsome, Reliable Timepiece.

ELECTONE AUTOMATI PROGRAMME SELECTOR

If any difficulty in obtaining write direct to — FREDK. J. GORDON & CO., LTD., 92, CHARLOTTE STREET, LONDON, W.1. Phone: Museum 5189.



To Set To Accumulator

**ANOTHER PRIZEWINNER
TELLS HIS STORY**

"Why I Chose The Mewflex"

By J. A. E. BLACK

**who won the Junior Prize at
New York**

When I decided to make up a set for the International Competition the first question that naturally presented itself was, what set should I construct? Should I build a three-, four-, five- or six-valver? At the time there was the "Elstree Six" or the "Solodyne," "Magic Five," or some other star set.

For a three-valve set the "Mewflex" is the best I have ever heard. Prague came in at full loud-speaker strength when London was on, London of course, was faintly audible, but only interfered in the intervals. Over forty stations were logged on this Radio Press set, all coming in at loud-speaker strength. The volume which the set gives on all stations is remarkable for three valves, and London (the local station) is inclined to blast, but this is beautifully controlled by the volume control, which enables one to bring the local station in with a purity and clarity of tone that speaks well for the design of the receiver.

The lay-out is extremely compact and neat. Although it is a small receiver as regards valves, the circuit makes the number of components necessarily fairly large, but four tuning dials, a filament switch and the volume control are all the knobs on the panel, and this makes for a very neat appearance.

These are the main reasons for which I chose the "Mewflex." It took me about a week to complete it and test it. All the tests were most satisfactory, and I am firmly of the belief that when conditions for wireless reception become better in the winter the set will give really great results. Selectivity combined with ease of control make the receiver a pleasure to operate, and its economy in valves a boon to all who have to carry their accumulators far to be charged. At first when I tested it I had no reaction, as one of the coils was dud. However, I logged Oslo, Frankfurt (loud-speaker strength), San Sebastian, Milan, Hamburg, London, Birmingham and others, even with that handicap. On the whole, the "Mewflex" is a three-valve set of remarkable capabilities, selective, and gives the utmost volume for the number of valves. When it returns from America I am discarding an efficient five-valve receiver which I now use for the "Mewflex," thus using half the current for H.T. and L.T. and getting better and purer results.

Improve your Loud Speaker with a better battery.

Your new H.T. Battery should be a Lissen new process.

Notice the difference it makes to your loud-speaker reproduction—there comes a new power smoothness, noticeably clearer reproduction, more powerful, more enjoyable than you have ever known it.

The success of this Lissen new process is now a definitely established fact and naturally the secret is closely guarded.

The quality of the energy supplied by a battery is as important as the quantity. Insist upon your being given the Lissen new process H.T. Take no substitute, for there is none for good loud-speaker work. If any difficulty send remittance to Lissen direct. No postage charged. Or will be sent by return C.O.D. Please mention dealer's name and address.

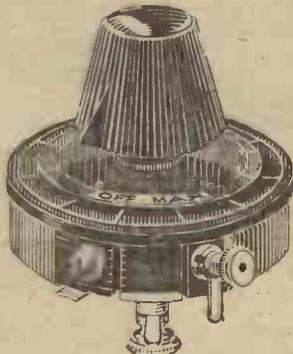
10/6

rated 60 volts.

Price would have been 13/- but for our new direct-to-dealer policy of distribution which cuts out all wholesale profits.



FINE RHEOSTAT AND A FINE POTENTIOMETER—



that is what they say who see the Lissen. You will say it too after you use a Lissen. And you will still say it after long use.

You don't want a former in your rheostat or potentiometer which will warp and buckle after a few months' use, or wires which will move about and short circuit, or a contact brush which will wear uncertain. That's why you will insist on a Lissen after comparing it with all others, for a Lissen Rheostat will never let you down like that.

Previously high priced and largely reduced because of our new direct-to-dealer distribution policy (which cuts out all wholesale profits) aided by our huge production programme.

	Previously.	Now.
LISSEN 7 ohms, patented ...	4/-	2/6
" 35 " " " ...	4/-	2/6
" Dual " " " ...	6/-	4/6
" Potentiometer, 400 ohms, pat.	4/6	2/6

Lissen one-hole fixing, of course—every one. Base board mounting type same prices as above.

IMPORTANT TO THE TRADE—Orders for all LISSEN parts must now be sent direct to factory and not to usual wholesale dealers. Apply for particulars of new trading policy if not already advised. Every dealer in his own interest should be registered with us.

LISSEN LIMITED, 18-22, Friars Lane, Richmond, Surrey.
Managing Director: T. N. COLE.

RUSHING INTO PRINT



FOR some reason or other there are at the present time quite large numbers of people who make use of wireless as a means of obtaining publicity at any price. Probably the most harmless kind of wireless advertiser is the man who gets into the limelight by his refusal to take out a licence, and hurls defiance at the heads of the police, the Post Office, the B.B.C. and the Government.

His efforts may possibly induce a few other cranks to enjoy for a time the entertainment provided by wireless without paying for it, but when these eventually see their leader haled before the Bench and smartly fined their enthusiasm for the "freedom of the ether" rapidly evaporates, and the skull and cross-bones is hauled down as quickly as may be from their aerial mastheads.

An Old Friend

Another example of those who rush into print is the man who is for ever writing letters on the "rotteness of the B.B.C. programmes." If the big dailies will not publish his fulminations he fills columns in the local Press.

Should you happen to meet one of these men he will tell you that he finds it impossible to listen to any programme at the present time. "Why, just look at last night's," he will say. And then he will give you a detailed criticism of every item that was broadcast from 2LO or some other station.

It is curious to note that though, as a rule, he is unable to read Morse, and cannot, therefore, confine his reception to telegraphy, the man who has no good word to say for the broadcast programmes takes his accumulator round to the charging station just as often as anybody else! Fair criticism is always an excellent thing, without it real excellence cannot be achieved. The grouser-publicist indulges mainly in destructive criticism, which is generally useless. On the whole, though, he is not a very dangerous person, for despite the energy which he expends in grumbling his way into print the number of those who regard the wireless receiving set as the best of all stand-bys for providing entertainment, continues to increase at a very rapid rate.

Hints and Tips

Another of those who rush into print is the man who is always writing com-

plaints that his call-sign is being misused by other people. Some of these cases are genuine, but not infrequently investigation shows either that the writer does not possess a call-sign or has no foundation for his complaint that other people have been helping themselves to it.

And lastly, there is the queer person who has somehow or other obtained a reputation as an expert and who contributes an occasional column of radio notes to the lay papers.

Some Examples

Some of the hints given in these columns are merely comic; others are, to say the least of it, not helpful. From important and well-known lay papers, which shall be nameless, I have recently culled the following pieces of information and advice:—(1) "The resistance of the filament of the average bright emitter valve may be taken as one ohm." (In this case a valve requiring 4 volts would consume 4 amperes!) (2) "If the earth connection is too good (!) it acts as a kind of drain and reduces signal strength." (3) "No small power valve works really well with less than 250 volts on its plate." (Such a voltage would ruin most types of small power valve in a very short time.) (4) "Three bright emitter valves on the helpful hinter's set consume between them 6 amperes of current, with a total wattage of 12."

R. W. H.

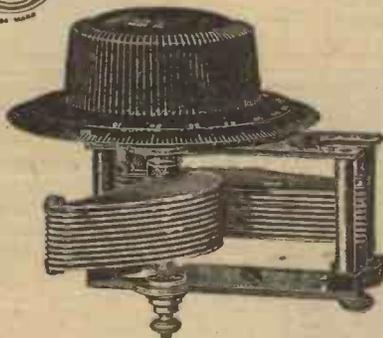
ASK YOUR DEALER

for the new



S. L. F.

The New J.B., S.L.F. Condenser is made on lines similar to our Low Loss Type (Pat. No. 241805). In addition, its many excellent new features include Special Bearings Top and Bottom which eliminate springs. Side and End play in the centre spindle is impossible. The Top Bearing is of large diameter and friction-lined, which ensures an absolutely smooth movement. The brass vanes are supported at tips to ensure accurate spacing. End plates are highly polished and all fittings are heavily nickel-plated.



Fitted with 1/2" shaft, sold complete with 4" Dial and is more compact than most S.L.F. Condensers.

Retail Prices :			
.0005 mfd 11/6
.00035 mfd 10/6
.00025 mfd 10/-

Particulars of the new J.B. Gang Control Condenser for the Elstree "Monodial," on application.

JACKSON BROS.

8, POLAND ST - OXFORD ST Telephone - GERARD 7414
LONDON - W.1
(First floor)

Agents for Holland: Radio Beurs, Papestraat 8, Sgavenhage, Hague, Holland

CLIX

NICKEL PLATED FITMENTS

Clix Wander Plugs



with patented helical spring plug ensuring perfect contact in all types of H.T. Batteries. Red or black insulator 2d. each.

Clix Spade Terminals



especially suitable for making connections where terminals are already fitted. Prevents twisting and breaking of wire. Red or black insulator 2d. each.

Clix Pin Terminals



a most convenient tag for general use, supplied with red or black insulator 2d. each

Clix Parallel Plugs



with resilient fitting having extraordinary radial expansion and compression. Red or black insulator Plug 2d. Socket 1d.

All the above are fitted with the patented bridge wiring channels. Obtainable from your wireless dealer.

AUTOVEYORS, LIMITED,

84, VICTORIA STREET, WESTMINSTER, S.W.1.

Phone: Victoria 309. Telegrams: "Autoveyor," Sower, London.

**INTERCHANGEABLE
FIXED CONDENSERS**

Handy plug-in fixed condensers for the experimental bench may be made from ordinary mica fixed condensers in the following way:—

To each soldering-lug of the fixed condenser solder a standard valve-pin. To do this, tin the lug well, then tin the valve-pin also. Apply a little flux to both pin and lug, and apply a really hot and well-tinned iron to the job.

The solder will run in quite easily, forming a firm connection. If de-

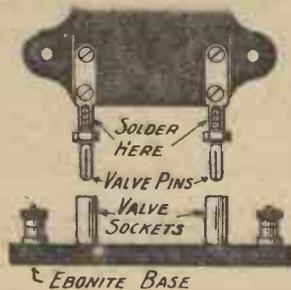


Fig. 1. — The valve pins should be soldered to the lugs of the fixed condenser.

sired, the valve-pin may be lashed to the soldering-lug with thin tinned wire before soldering. This makes a sounder job.

Finally, mount upon an ebonite base (or upon a receiving set, if preferred) two valve legs, spaced the same distance apart as the lugs of the condenser, as shown in the illustration.

A. P.

NEWS IN ADVERTISEMENTS

The price of complete coil kits for various Radio Press sets is incorporated in the advertisement of Messrs. Collinson Precision Screw Co., Ltd.

The "Lissenola" loud-speaking unit manufactured by Messrs. Lissen, Ltd., undergoes a convincing test, states this firm's announcement.

A new range of valves is announced to readers in the advertisements of S.T. Ltd. It will be noted with interest that the Dynamic Curve of the S.T. 63 Super Power Valve is featured in one of this company's advertisements.

Readers are invited to write to Dept. 134 of the Bennett College for a free booklet giving full details of their "teach-by-post" educational courses.

The Centadyne Screened Coils are being advertised by Messrs. Falk, Stadelmann & Co., Ltd.

A Midget Reaction Condenser for either panel or baseboard mounting is now being produced by Messrs. Peranne & Co., Ltd.

A new S.L.F. Variable Condenser—the Etherplus—is being marketed by Messrs. M. & A. Wolf.

CLEARTRON VALVES

1926-1927 NEW MODEL



YOUR SAFEGUARD

THE multiplicity of Radio Valves now upon the market is almost bewildering. This makes it the more incumbent upon careful users to pick and choose. The only American - designed Valve "Made in Britain's Newest Factory" is

14/- CLEARTRON 18/6

which embodies the latest research work in the art of Wireless on both Continents.

The Highest Vacuum } in the HI-VAC Valve
Known to Science }

The Sturdiest Construction } meaning
and Strongest Filaments } LONG LIFE
and that well-known

Majestic Volume and Operatic Purity

Above all

THE IRONCLAD GUARANTEE

(your safeguard)

The only Valve on the market which offers INSTANT REPLACEMENT WITHOUT COST OR QUESTION if the user is not wholly satisfied!

Would CLEARTRON dare to make this unique offer if CLEARTRON Valves did not perform 100%?

Send for our 1926/27 New Catalogue.

C.T.64

CLEARTRON RADIO LIMITED

One Charing Cross, London, S.W.1. Works: Birmingham
Telephone: Regent 2231-2. Telegrams: Cleartron, Westrand, London.

Cheaper and Better Jacks

Ashley Radio Jacks are made of nickel silver springs, with pure silver contact and Bakelite insulation throughout. Tags are tinned and spread fan wise for easy soldering.

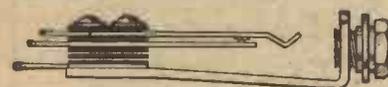


SHOWING HOW TAGS ARE FANNED.

Note the Prices below:



JACK No. 1. SINGLE CIRCUIT (OPEN). 1/3



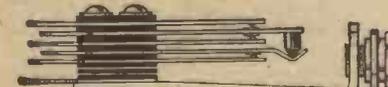
JACK No. 2. SINGLE CIRCUIT (CLOSED). 1/6



JACK No. 3. DOUBLE CIRCUIT. 1/9

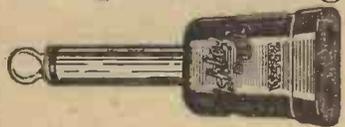


JACK No. 4. FILAMENT SINGLE CONTROL. 1/9



JACK No. 5. FILAMENT DOUBLE CONTROL. 2/3

Telephone Plug



Price 1/6

Occupies less space than any other plug. Metal parts highly nickelled and polished. Bakelite insulation throughout, suitable for spade or pin tags, and any type of flexible or solid wire connection.

Ashley Radio

Ashley Wireless Telephone Co. (1925), Ltd.
Finch Place, London Road, Liverpool.

ARE YOU WASTING H.T. CURRENT?

ONE often hears complaints that high-tension batteries do not last nearly so long as they should. Only the other day a friend told me that his four-valve receiving set, which was in use on the average for about ten hours a week, required a new H.T. battery every six months. He does not use small batteries or those of cheap foreign make. He buys always first quality batteries of large size. There was obviously something wrong here, since batteries of this kind, if the discharge rate does not exceed 10 milliamperes, should give from seven to eight hundred hours of work. With a four-valve set, the last valve being one of the small power type, 10 milliamperes is a very generous allowance, and he was getting only about 260 hours of work.

The Test

Consequently the next time that I went round to his house I took with me a milliammeter. On wiring this into the high-tension battery circuit I found that the current passed was 15 milliamperes. Investigation showed that the grid battery was almost run down, and when a new one was fitted and the bias properly adjusted a great reduction was effected. A further point, however, was noticed. When all the rheostats were in the "off" position, or when the accumulator was disconnected altogether, the milliammeter instead of registering zero, as it ought to have done, showed that a small current was passing, the reading being about half a milliampere. This meant that even when the set was not in use the high-tension battery was always under a small load and that current was being drained from it to no purpose. On testing the set out I found that there was a leak through the condenser shunted across the high-tension battery.

Remedies

Not everyone possesses a milliammeter, though many of those who do not will be able either to borrow one or to get a friend who has one to test out their sets occasionally. If this is done you know just what is happening to your high-tension battery both when the set is working and when it is out of use. Should any reader be unable to make the milliammeter test he can ensure that his consumption of high-tension current is not excessive by paying attention to two points. In the first place never try to work a power valve without proper grid bias. Remember that grid batteries do not last for ever, but require renewal every six months or so. Secondly, make a rule of switching off the high-tension battery as well as the accumulator when the receiving set is not in use.

R. W. H.

SIX COUNTRIES



ON ONE VALVE!

Extract from Radidea's article in Manchester Evening Chronicle, Sept. 30th, 1926.

"During the week-end I have been testing one of the new BENJAMIN SP.55 Valves, this being a 6-volt power valve.

It has an anode impedance of 3500 ohms, an amplification factor of 6, with short-path construction and dull-emitter filament.

I used the new reflex unit, which is described in the forthcoming new edition of the Wireless Guide, and obtained a volume equal to any two-valve set employing a detector and one stage of L.F.

This unit was connected to the new Chronicle Crystal Set giving full loud speaker volume from MANCHESTER; in fact, too loud for an ordinary sitting room.

I started off with HILVERSUM on Sunday, tuning in the morning service at 9.45, followed by HAMBURG at 11 a.m. giving a lesson in some other language.

FRANKFURT was tuned in at noon, and I listened to a most excellent concert for nearly one hour, and immediately the MANCHESTER Station closed at 6 p.m. I tuned in COPENHAGEN, giving the time signal and chimes.

At the close of the MANCHESTER transmission I tuned in DUBLIN, followed by BRESLAU, UNION RADIO, MADRID, and the lady giving the late news from ROME. The church service from NEWCASTLE was heard distinctly and I logged 22 amateur transmitters during the day.

DAVENTRY was at good loud speaker strength, and the transmission from PARIS, Eiffel Tower, was good 'phone strength.

As I pointed out.....a few weeks ago this type of valve is

the finest in the world for a reflex set,

giving full volume with a beautiful quality."

THE BENJAMIN RANGE.

- S.P. 18 RED 14/ Fil. Volts 1.6 Amps .3
- S.P. 18 GREEN 14/ Fil. Volts 1.6 Amps .3
- S.P. 18 BLUE 14/ Fil. Volts 1.6 Amps .09
- D.E. 55 18/6d. Fil. Volts 3.5 Amps .09
- S.P. 55 BLUE 18/6d. Fil. Volts 5.5 Amps .09
- S.P. 55 RED 22/6d. Fil. Volts 5.5 Amps .25

BENJAMIN
SHORTPATH
VALVES

THE BENJAMIN ELECTRIC LIMITED,
Brentwood Works, Tottenham, London, N.17.

—electric
light in your
home—?

IF SO, WHY NOT
GET YOUR
H.T. SUPPLY
FROM THE MAINS?

You can make sure of a perfect and constant High Tension supply entirely free from cracking, hum or ripple.

TUDORADIO MAINS UNITS

Can be connected to the nearest lampsocket. Current consumption is negligible, and expensive and troublesome batteries can be done away with once and for all. There are two types: D.C. for direct current and A.C. for alternating currents. There is no risk to your valves or set with either of them. Ask your dealer for details or apply direct to:—

Other Models for Other Sets.

USE TUDORADIO MAINS UNITS



TUDORADIO
D.C. OR
A.C.
MAINS
UNIT

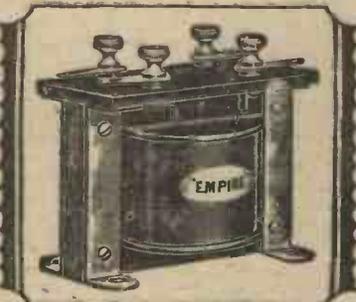
Output volts 100.

Price **35/-** complete

THE TUDORADIO COMPANY, LIMITED,

Tudor Works, Park Royal,
London, N.W.10.

Telephone: Wembley 41.



7/6 A RELIABLE 7/6 BRITISH TRANSFORMER

A Prominent Wireless Paper said recently: "On test the two samples sent in gave surprisingly good results. They evinced an efficiency out of all proportion to their size and price."

SHROUDED? Why shroud a good Transformer? It is unnecessary. The Empire Transformer is not shrouded. Shrouding often lowers the efficiency of a Transformer by introducing a condenser effect, and sometimes only covers inferior workmanship. 75% of the Empire Transformer's total weight is effective iron core and copper wire and is open to inspection.

7/6 STANDARD RATIOS 7/6
12 months' written guarantee.

EMPIRE TRANSFORMER

THE H.T.C. ELECTRICAL CO., LTD.,
4, Boundaries Road, Balham, London,
S.W.12. Phone: Battersea, 0374

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ARE YOU GETTING THE MOST
FOR YOUR ENERGIES?
THE BENNETT COLLEGE
WILL SHOW YOU HOW TO INCREASE
YOUR EARNING POWER.

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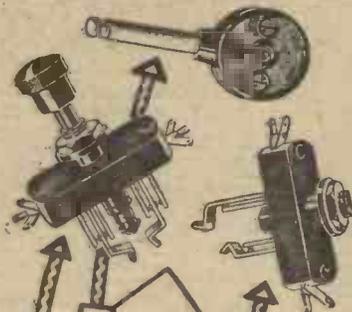
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THE MONODIAL AND HOW IT WORKS

(Continued from page 352)

An Important Point

It will be seen that with the layout that has been adopted all the H.F. currents are kept to one side of the receiver, while on the other only L.F. currents are allowed to pass. In order to keep any H.F. currents out of the L.F. side special precautions have been taken, details of which will be given further on.

Lest any may doubt that a low-frequency transformer will pass on H.F. currents I can definitely assure the reader that this can, and frequently does, occur. A crystal detector and milliammeter connected in the plate circuit of a valve supposed to be amplifying at low-frequency only, being connected in such a way by means of chokes and condensers that only H.F. currents shall reach the crystal, will give a marked deflection on the meter, showing the presence of H.F. currents of no mean order.

Battery Connections

A very convenient method of connecting the receiver to its batteries has been made use of. Instead of terminals a braided battery cord has been employed. This consists of a number of lengths of flex all braided together into one cord. The cord as supplied by the makers is supplied with spade tags connected at one end of the separate pieces of flex, while wander plugs and spade tags adorn the other ends, which are intended for connecting to the batteries.

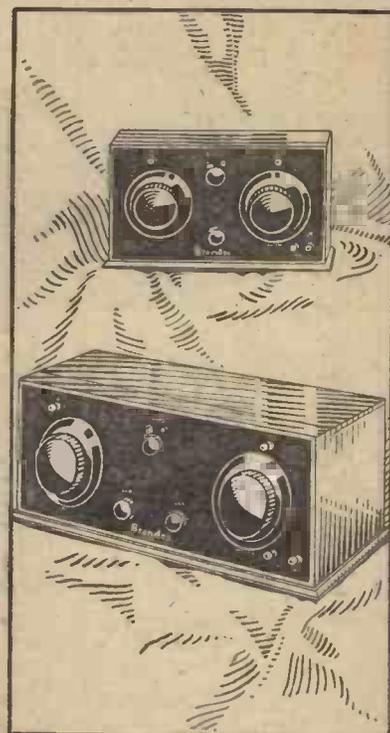
I have, however, cut off the spade tags at the set end of the cord and soldered the various leads direct to their respective destinations in the receiver. The cord itself is firmly fixed to the baseboard by means of a metal staple, so that in the event of a sudden jerk being given to the cord no connections will be broken.

Neat Appearance

The use of this cord and the two flexible leads for aerial and earth connections allows all leads to be kept out of sight behind the receiver, while no difficulty will be experienced in making the correct connections, as sometimes is the case where the set is placed in a rather dark part of the room, thus making it difficult to identify terminals with possibly disastrous results to valves.

Since the photos of the set were taken, one or two minor improvements in the receiver and the circuit have been made. Full details of these alterations, together with instructions for the building of the set, will be given next week. All the necessary working drawings will be provided, while hints and advice as to the operation of the set will be included.

EXPERTS IN RADIO



TWO NEW SETS

THE BRANDESET II.

The new Brandes 2-valve set is designed for ease of operation, real compactness, and thoroughly efficient loudspeaker work. It is simple to operate, and will bring most excellent results from local broadcast stations, and the high power station. It will give good loudspeaker results during long range work, depending, of course, on the efficiency of your aerial and earth. It is of the same excellent quality of all Brandes' products, and is reasonably priced. **£6:10**

(Exclusive of Marconi Royalty and Accessories.)

THE BRANDESET III.

Like the 2-valve set, the new Brandes 3-valve receiver is designed for ease of operation, marvellous compactness and guaranteed efficiency. If loudspeaker results of great purity and volume are expected from a number of outlying stations, its performance in this direction is unequalled. Both sets have but three controls on the panel, and can easily be operated by a novice. The 3-valve set has, of course, a greater range, but in other respects its characteristics are the same as the 2-valve set. **£8:10**

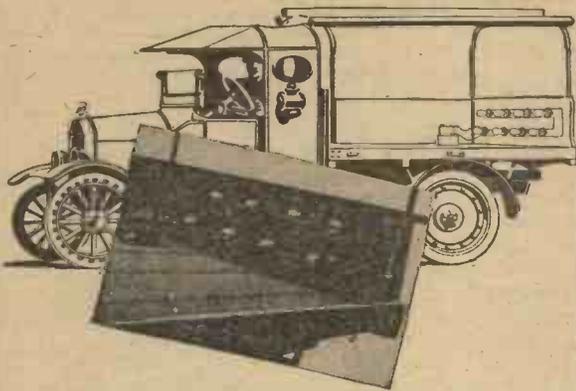
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Mr. Scott-Taggart to Enter Valve Business

(Concluded from page 338)

valve, have been published in foreign countries, and he is an honorary member of the German Radio Society.

Mr. Scott-Taggart has lectured before the British Association, and at one time devoted considerable attention to the fostering of the Radio Society movement. He was a member of the Council of the Radio Society of Great Britain and president of several Radio Societies.

Radio Press, Limited

In 1922 Mr. Scott-Taggart established Radio Press, Ltd., as a radio publishing organisation, and has built up the business to its present successful state. Those who have worked with him have been greatly influenced by his enthusiastic aim at technical accuracy in the articles and efficiency in the receiver designs published.

The slightest error in one of his papers has always been followed by what has almost amounted to a court of inquiry to see exactly how the error arose. With regard to the receiver designs, he leaves behind a tradition of seeing that every set is put to exhaustive test and reaches a very high standard before a description is published.

Founding Elstree

It is partly on this account that he conceived the idea, most unusual for a publishing firm, of establishing special laboratories where apparatus could be put through exhaustive tests and new ideas and designs tried out. The result was the Elstree Laboratories. Mr. Scott-Taggart has amply justified his views on the sound design of receiving apparatus by the production of such receivers as the "Elstree Six," "Solodyne," "Elstreflex," "Magic Five," and other leading designs emanating from the Elstree Laboratories.

The New Company

It is not illogical that Mr. Scott-Taggart should desire to enter the valve business. He possesses all the necessary qualifications for success in this branch of work. We feel convinced that he would not have taken this step unless he were wholeheartedly confident of the product his company is to produce. He is probably the only person in this country who has acquired a wide reputation as an expert on the use of valves as well as

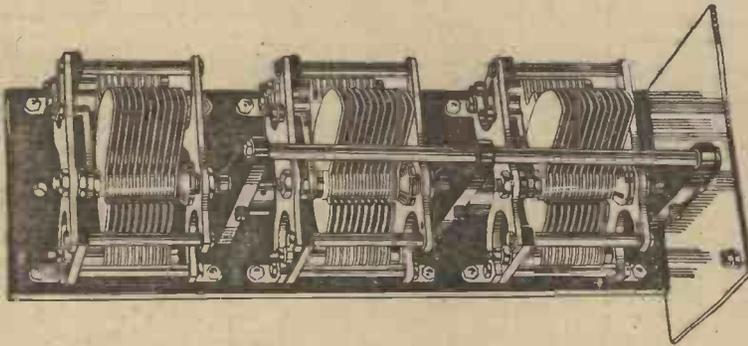
their manufacture. The average valve maker is rather inclined to look upon a valve as a form of lamp, and rather to ignore the suiting of the valve to the circuit in which it is to be employed. The use of proper valves for certain purposes is a comparatively recent development, and no doubt Mr. Scott-Taggart's unique experience of modern receiver designs will be an important factor in his new activities.

The Future

On the technical side of Radio Press, Ltd., there are able engineers who will take Mr. Scott-Taggart's place, and the existing traditions will be carried on exactly as before. We have made arrangements whereby we shall from time to time publish articles from Mr. Scott-Taggart's pen, and we are sure that readers will join with us in wishing him every success in his new sphere of activities.

A New Appointment

Some twelve months ago Mr. Scott-Taggart resigned the managing directorship of Radio Press, Ltd., so the actual management of the business remains, as heretofore, in the hands of Mr. Robert A. Lodge, A.S.A.A. Mr. J. H. Reyner, B.Sc., A.M.I.E.E., has been appointed technical manager of the company—an appointment which, we feel sure, will meet with satisfaction in every quarter.



CONSTRUCTORS are giving this handsome new model a most enthusiastic welcome because of (1) Its absolute freedom from whiplash. (2) Independent adjustment of each Condenser by novel means, completely eliminating hand capacity.

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To avoid this the following rule should be observed in making variable condenser connections:—If any difference of high-frequency potential exist between the points to which the condenser is to be connected, always connect the moving plates to the lower potential side and the stationary plates to the higher.

To take examples:—In the aerial tuning circuit of a receiver connect the moving vanes to the earth side and the fixed to the aerial; and in a tuned anode circuit connect the fixed vanes to the plate of the valve, and not, as might be supposed, to H.T. positive. This precaution will eliminate hand capacity effects to a large extent when tuning.

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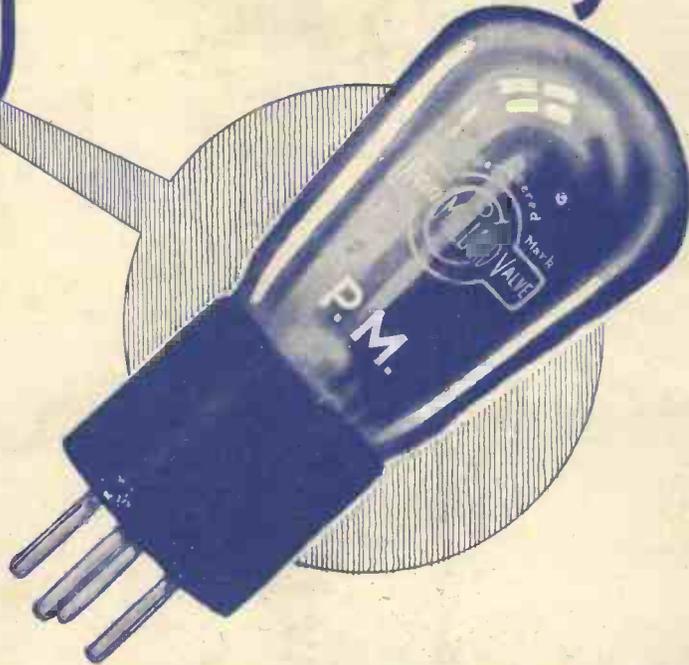
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