Below the Pyrometer scale

THE LOW OPERATING TEMPERATURE OF THE WONDERFUL MULLARD P.M. FILAMENT.

The pyrometer can no longer claim to record the operating temperatures of all valve filaments.

The wonderful P.M. Filament has a working temperature that is as low as 180 degrees below the pyrometer scale.

No sign of glow can be discerned from this unique filament with its striking economy of heat.

You will appreciate the greatly increased valve life that can be secured with this P.M. Filament.

Nothing is sacrificed.

With the P.M. Filament you receive up to 5 times the emission of an ordinary filament.

The current consumption (only one-tenth ampere) makes your accumulator charges last seven times as long.

In addition, the P.M. Filament is so tough and well-supported that it cannot be broken except by the very roughest handling.

For customer satisfaction give your receiver valves with the wonderful P.M. Filament and make your radio better, stronger and 85% more economical.

ASK YOUR RADIO DEALER FOR MULLARD P.M. VALVES.

Mullard
THE MASTER VALVE

British made in a British Factory

For 4-volt accumulator or 3 dry cells
THE P.M.1 (Power) 0.1 amp. 14-
THE P.M.5 (General Purpose) 0.1 amp. 18/6
For 6-volt accumulator or 4 dry cells
THE P.M.1 (Power) 0.1 amp. 18/6
THE P.M.5 (General Purpose) 0.1 amp. 18/6
For 2-volt accumulator
THE P.M.1 LF 0.1 amp. 14-
THE P.M.1 LF 0.1 amp. 14-
THE P.M.2 (Power) 0.15 amp. 18/6
These prices do not apply
in Irish Free State.
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Edited by J. H. REYNER, B.Sc. (Hons.), A.M.I.E.E.


Nothing contained herein is to be regarded as permission or encouragement to infringe any patents.

TABLE 1

<table>
<thead>
<tr>
<th>Coil</th>
<th>Inductance in microhenries</th>
<th>Self-capacity in micro-microfarads</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>61</td>
<td>15</td>
</tr>
<tr>
<td>40</td>
<td>90</td>
<td>15</td>
</tr>
<tr>
<td>50</td>
<td>150</td>
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<tr>
<td>60</td>
<td>200</td>
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</tr>
<tr>
<td>75</td>
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</tr>
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<td>300</td>
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TABLE 2

<table>
<thead>
<tr>
<th>Coil</th>
<th>Parallel capacity in micro-microfarads</th>
<th>Wave-length in metres</th>
<th>Effective resistance in ohms</th>
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</thead>
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<tr>
<td>35</td>
<td>300</td>
<td>264</td>
<td>2.8</td>
</tr>
<tr>
<td>40</td>
<td>310</td>
<td>315</td>
<td>2.9</td>
</tr>
<tr>
<td>50</td>
<td>406</td>
<td>472</td>
<td>5.3</td>
</tr>
<tr>
<td>60</td>
<td>472</td>
<td>573</td>
<td>5.3</td>
</tr>
<tr>
<td>75</td>
<td>540</td>
<td>774</td>
<td>6.6</td>
</tr>
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<td>100</td>
<td>1,250</td>
<td>1,580</td>
<td>19.7</td>
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<tr>
<td>150</td>
<td>1,860</td>
<td>2,230</td>
<td>28.8</td>
</tr>
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<td>200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>250</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>300</td>
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</tbody>
</table>

Results of independent H.F. tests made by the N.P.L.

Here are the figures — judge for yourself!

The National Physical Laboratory figures fully bear out our claim that the LEWCOS Coil is the most efficient produced. In the design of radio inductances, the smaller the R/L value for any circuit, the greater is the selectivity and the signal strength. This fact has predominated over all other considerations in producing Lewcos Inductance Coils with the result that we can publish without fear the R/L values for LEWCOS Inductance Coils as obtained from the N.P.L. measurements together with the wave length at which measurement was made. LEWCOS Coils make all the difference in reception. Ask your wireless dealer to demonstrate the Lewcos Coil on his set. Descriptive leaflet gladly sent on application.

LEWCOS Inductance Coil

The London Electric Wire Company and Smiths, Limited

Tell the Advertiser you saw it in "Modern Wireless."
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 known to Science in the HI-VAC Valve. The Sturdiest Construction meaning and Strongest Filaments LONGLIFE 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.

CLEARTRON RADIO LIMITED

1, CHARING CROSS, LONDON, S.W.I.

Telephones: Regent 220-2.

Works: BIRMINGHAM.

Telegrams: "Cleartron, Westrand, London."

Tell the Advertiser you saw it in "MODERN WIRELESS."
The set described in this article has been designed with the object of giving good all-round results. It will give excellent reproduction from the local station and very good loud-speaker signals on many British and Continental stations. A volume control is provided which enables very loud signals to be adjusted to the strength required.

The excellent reproduction which may be obtained from a correctly operated detector and two or three valve resistance-coupled amplifier receiver is too well appreciated to need comment here, and a set, therefore, on these lines, but with a stage of high-frequency amplification, on modern lines, to give added range and selectivity, will make its appeal. The set about to be described utilises a simple and popular circuit, the tuning coils being screened in order to eliminate interaction between the high-frequency circuits and also direct pick-up when the set is used near to a powerful broadcasting station.

Compact Layout
The combination of screened coils and resistance coupling on the note magnifier side makes it possible to obtain a very compact lay-out, which in turn makes wiring extremely simple. For use comparatively close to the local station in cases where it is impossible to erect a reasonable outdoor aerial, a frame may be substituted in place of the aerial tuning coil, this arrangement introducing no tendency towards instability, since interaction between the frame and the high-frequency transformer is prevented by the latter being screened. The frame therefore can be orientated without readjustment of the neutralising condenser being necessary, as is sometimes the case where unscreened coils are used for the H.F. coupling.

Stations Heard on the Loud-Speaker.

<table>
<thead>
<tr>
<th>Station</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liege</td>
<td>1675 kHz</td>
</tr>
<tr>
<td>Kiel</td>
<td>1635 kHz</td>
</tr>
<tr>
<td>Lyons</td>
<td>1575 kHz</td>
</tr>
<tr>
<td>Toulouse</td>
<td>1535 kHz</td>
</tr>
<tr>
<td>Barcelona</td>
<td>1495 kHz</td>
</tr>
<tr>
<td>Oslo</td>
<td>1600 kHz</td>
</tr>
<tr>
<td>Naples</td>
<td>1550 kHz</td>
</tr>
<tr>
<td>Bournemouth</td>
<td>1500 kHz</td>
</tr>
<tr>
<td>Hamburg</td>
<td>1450 kHz</td>
</tr>
<tr>
<td>Brussels</td>
<td>1400 kHz</td>
</tr>
<tr>
<td>Dublin</td>
<td>1350 kHz</td>
</tr>
<tr>
<td>Daventry</td>
<td>1300 kHz</td>
</tr>
<tr>
<td>Glasgow</td>
<td>1250 kHz</td>
</tr>
</tbody>
</table>

The set may be used with a frame or outside aerial as desired. Blue-print No. 184a (free).
programme, Bournemouth was quite free of London and came in at satisfactory loud-speaker strength. In the course of an hour’s test on a Sunday evening, between 7 and 8 o’clock, twenty Continental transmissions were tuned in upon the loud-speaker, ranging in strength from fair to really good. Of these transmissions, mostly unidentified, but of German, Spanish and French origin, eight were of adequate strength and sufficiently free from interference to be really worth listening to.

The Circuit
In character the circuit is straightforward and simple, the technical details being given in Fig. 1. When an outside aerial is used it is connected to the tuned grid coil L1 by the usual auto-coupling arrangement, only one socket, A4, for this purpose appearing on the front panel and a flex lead being utilised which may be taken to either of two tappings on the coil. An extra terminal, A3, is incorporated so that a frame may be used, this latter being connected between the A3 and E sockets. When this is done, of course, the aerial coil L1 is not required. The high-frequency valve is coupled to the detector by means of a standard split-primary transformer, this providing a very simple neutralising arrangement. Reinsart type reaction is obtained by employing the standard transformer reaction winding. This necessitates that a radio-frequency choke coil be placed in the plate circuit of the detector valve, and here a plug-in coil is used, since the size may be changed when it is desired to go from the lower to the upper broadcast waveband. Incidentally, this choke serves a further useful purpose in keeping high-frequency currents to the H.F. and detector portion of the set, and the tendency of resistance-coupled note magnifiers to amplify high-frequency currents is thus counteracted.

Rectification
Rectification is effected by the lower anode-bend method, and to simplify matters the usual potentiometer is omitted, since by varying the detector H.T. voltage adequate control is obtained. In practice the detector grid bias...
All battery connections are made direct by means of flexible leads.

battery, G.B.I., may generally be a single dry cell when resistance-coupling type valves are used for $V_\beta$.

A Filter Circuit
The resistance coupling for the three note magnifiers follows standard lines, but in the plate circuit of the last a filter circuit is incorporated in order that the loud-speaker may have to carry only the fluctuating currents representing signals, this being beneficial from the point of view of protecting the windings. The Duvalcon resistance $R_{12}$ in series with the loud-speaker is for the purpose of volume control.

The Panel
The design of the receiver is such that only a small panel 16 in. by 8 in. is required, and on it are mounted the aerial tuning condenser to the left-hand side, that tuning the secondary of the high-frequency transformer in the centre and the reaction condenser...

COMPONENTS REQUIRED

- One Radium panel, 16 ins. by 8 ins. by 3/16th in. thick (American Hard Rubber Co. (Gt. Britain), Ltd.).
- One cabinet to take above panel and baseboard, (Pickett's).
- Five Clearer-tone valve holders (Benjamin Electric, Ltd.).
- Five baseboard mounting rheostats (Lissen, Ltd.). (These should be chosen to suit the valves to be used.)
- Three 100,000 ohms anode resistances and bases (Varley Magnet Co.).
- Two .0005 S.L.F. condensers (Jackson Brothers).
- One .00025 S.L.F. condenser (Jackson Brothers).
- One neutralising condenser (A. F. Bulgin and Co.).
- One single-coil holder (A. F. Bulgin and Co.).
- Three .01 T.C.C. fixed condensers (Telegraph Condenser Co., Ltd.).
- One 2 mfd. Mansbridge type condenser (Telegraph Condenser Co., Ltd.).
- One standard audio-choke (Beard and Fitch, Ltd.).
- One filament "on and off" switch (Igranic Electric Co., Ltd.).
- Three 1/4 megohm grid leaks (Igranic Electric Co., Ltd.).
- One aerial coil and one split-primary H.F. transformer and screening cases (Bowyer-Lowe, Burne-Jones, Collins n. Etc., etc., Lewes or Peto-Scott). One Duvalcon (Dunfell Condenser Co. (1925), Ltd.).
- One ebonite sub-panel, about 2 1/2 ins. square and 3/16th in. thick.
- Five Elexx sockets (J. J. Eastick and Sons).
- Thirteen Elex or Cix plugs.
- A quantity of Glazite wire, rubber-covered flex, heavy twin flex, screws, etc.
- Radio Press Panel Transfers.
The wiring diagram. Note that no battery terminals are used, direct flexible connections being employed instead. Blue print No. 184b (free).
to the right-hand side. Incidentally this latter control may be used with impunity when the high-frequency valve is properly neutralised, since the circuit is then of non-radiating type. The three Elex sockets on the left-hand side are, reading from top to bottom, that for the outside aerial, the second for one side of a frame, if used, and the other for the earth lead, or alternatively the other side of the frame.

**Simplifying Wiring**

To make the wiring easy, where leads are very short, I have used bare 20-gauge tin copper wire, since it would be difficult to wire here with stouter wire, which latter is therefore used for the longer leads where rigidity is required. For the L.T. battery leads twin red and black covered flex has been used, whilst for the H.T. battery connections rubber-covered flex is employed.

**Battery Leads**

The usual terminal strip for H.T. and L.T. connections has been omitted, for the sake of simplicity, and leads are taken direct to the batteries concerned, only one small hole in the right-hand back corner of the cabinet being required for this purpose. For the loud-speaker connections, two sockets, on a small ebonite sub-panel, are required and two small holes in the left-hand back corner of the cabinet.

(Concluded on page 631.)

---

**WIRING INSTRUCTIONS**

Join E to moving plates of C1; moving plates of C1 to E of screen base for L1; E of screen base for L1 to one side of S, and one side of R1; same side of R1 to E of remaining screen base; E of same screen base to one side of R2; attach flex lead to same side of R2 for GB1+. Also join E of screen base for L1 to terminal 2 of L1; terminal 2 of L1 to one side of R3; same side of R3 has flex lead joined to it for GB2+. and is connected to one side of R4; same side of R4 to one side of R3.

Join fixed plates of NC to terminal 3 of L2.

Join A2 to moving plates of NC; moving plates of NC to fixed plates of C1; fixed plates of C1 to terminal I of L1; terminal 1 of L1 to G of V1.

Join A1 to aerial tapping 3 with flex wire.

Join flex lead to remaining side of S for L7–.

Join F– of V5 to F– of V1, F– of V1 to F– of V2; F+ of V2 has two flex leads joined to it for HT– and LT+ and is connected to F+ of V3; F+ of V3 to F+ of V4.

Join F– of V1 to remaining side of R1.

Join F– of V2 to remaining side of R2.

Join F– of V3 to remaining side of R3.

Join F– of V4 to remaining side of R4.

Join F– of V5 to remaining side of R5.

Join flex lead to terminal 4 of L2 for HT+ 1.

Join A of V1 to terminal 5 of L2.

Join fixed plates of C2 to terminal 1 of L3; terminal 1 of L3 to G of V2.

Join terminal 2 of L3 to moving plates of C2; join flex lead to moving plates of C2 for GB1–.

Join moving plates of C3 to terminal 6 of L4.

Join moving plates of C3 to A of V2; A of V2 to pin of holder for R – F.C.

Join socket of holder for R – F.C. to one side of R6; same side of R6 to one side of C4.

Join other side of C4 to G of V3 and one side of R7.

Join A of V3 to one side of C5 and one side of R8.

Join G of V4 to remaining side of C5; same side of C5 to one side of R9.

Join other side of R9 to remaining side of R7 with flex lead, and join flex lead to same side of R7 for GB2–1.

Join A of V4 to one side of C6; same side of C6 to one side of R10.

Join G of V5 to remaining side of C6; same side of C6 to one side of R11.

Join flex lead to other side of R11 for GB2–2.

Join A of V5 to one side of Z and one side of C7.

Join one loud-speaker terminal to remaining side of Z; same side of Z to remaining side of R10; same side of R10 to remaining side of R8; join flex lead to same side of R8 for HT+ 3.

Join flex lead to remaining side of R6 for HT+ 2.

Join remaining loud speaker terminal to one side of R12.

Join other side of R12 to remaining side of C7.
HAVE long been a most profound admirer of the fellows who write the gossip pages in the illustrated daily papers. Must it not be delightful to spend one's whole time calling upon Lady This or the Duke of That, to pass the time of day with the leading figures of Society whenever one meets them, to be on back-slapping terms with all the celebrities of the stage, the police court, the betting ring and the treasure-hunting field? But above all things what I most admire is the infinite capacity of these writers for consuming luncheon and their wonderful power of being in at least four places at one and the same time in case of need. I always study their writings closely, to my own great profit, as the first paragraph almost invariably begins "Lunching yesterday at the Ritz. . . ." A little lower down the column you find, "Whilst enjoying a light luncheon at the Carlton . . . ." Two or three paragraphs with no reference to food follow, then: "There was quite a crowd yesterday at the Savoy . . . ." This will teach you to mend your ways!" thundered the headmaster, brandishing his horrid waxed pencil. "Please, sir, it wasn't me," said young Bandyshanks without hesitating for a moment. "I went to the Haymarket, I observed Colonel Gore-Bristleby chatting with Prince Potzaupski. When I was at Eton with the Prince and at Rugby with the Colonel . . . ."

What About Us?

This is all very well, but what I want to know is where do we poor wireless folk come in? Why should we not run up against or run into or run over or even run down? Day after day I have searched the gossip columns for a little paragraph such as "Dropping into Lockhart's yesterday I found the Listener-in lunching off sausages and mash. I have always thought that he was quite one of the best-looking men about Town, and he is of course renowned for his excellent taste in clothes. As I passed over to chat with him I noticed that he was striking a note of chaste originality by sporting . . . ."

The catch of the season," she cried gaily.

when I dropped in for lunch . . . ." Another most interesting pursuit is to compute the miles covered in a day by the writer.

A Busy Day

The record is, I believe, held by one fellow who last summer attended the Test Match at Net

ingham in the morning, lunched at four different London restaurants, spent the afternoon at Newmarket, had tea in Hampstead, Mayfair and Richmond, dined in the p'ace, attended the Tattoo at Aldershot in the evening and trotted off a good day's work by stopping in most of the West End, after dropping in for a fox trot or two at half-a-dozen different night clubs.

Those Seats of Learning

I love, too, the pleasant friendly way in which they write of those who sit in the seats of the mighty, all of whom have known since boyhood days. "Strolling down Piccadilly yesterday," you read, "I ran into Lord 'Wuffles' Biggar, who was being moaning the fact that his valet wouldn't allow him to wear peacoats and a scarlet tie. Wuffy, as we used to call him at Cambridge, always had an eye for colour. . . . As I turned into Bond Street I met Captain Bingo Pinto, who told me something of his latest venture. I remember when we were at Oxford together how he always said that one day, . . . Continuing my stroll down Regent Street I found myself face to face with Sir Ian McKelpie, who had amassed a fortune by selling breeks to Highlanders. In these far-away University days at St. Andrews we always prophesied that 'Potty,' as we called him affectionately, would go far. . . ."

Angostura Bitters tripped over her umbrella and fell literally into my arms. "The catch of the season," she cried gaily, as I picked myself up from the gutter. . . . Only those who were at Harrow with him realise what a wit Lord Tutu Bandyshanks is. I shall never forget his retort to the headmaster when he was about to be publicly barred before the whole school for some minor misdemeanour. 'This will teach you to morn your ways!' thundered the headmaster, brandishing his horrid waxed pencil. 'Please, sir, it wasn't me,' said young Bandyshanks without hesitating for a moment. 'I went to the Haymarket, I observed Colonel Gore-Bristleby chatting with Prince Potzaupski. When I was at Eton with the Prince and at Rugby with the Colonel . . . .'
patent leather boots, spats, jazz stockings, plus-fours and a frock coat. The Old Borstalian's tie in a made-up bow round a celluloid collar added just that little touch of colour that all really well-turned-out men value so greatly. When we were at Dartmoor together I was the Listener's fag, and I shall

never forget the kind and fatherly manner in which he kicked me downstairs whenever his eggs were not boiled to his liking." That, I think, would be the stuff to give them. If, instead of references to politicians, artists and other queer creatures who do not matter two hoots, we had jolly little paragraphs about wireless people, I am sure that the circulation of the morning papers would rapidly double itself. As I am always ready to step into any breach I will now proceed to a few model paragraphs, giving intimate information about some of the greatest of the great for your edification and for the instruction of those who fill the gossip pages.

A Safety Valve

I was just being flung out of the Air Force Club, into which I had strayed by mistake, one day last week when I collided with Captain Pulihard, who was coming in. As we sat together upon the steps, he recovering the wind which I had knocked out of him and setting my somewhat dishevelled raiment in order, I ventured to ask him the time. "Two o'clock," he said. "A.m.?" I queried. "No, p.m." he thundered with majestic volume. A spiritualist once told me that Captain Pulihard had a remarkably fine aura.

A Treasured Tip

I had hardly taken more than a few steps down the street when I observed Senator O’Nee about to enter a taxi. Sweeping off my hat and brushing aside the attendant commissionaire I hastened to open the door for him. Feeling in his waistcoat pocket, he produced a small something which he placed into my palm. It was a gridlock. I am having this stuffed by Roland Ward, and when the job is done it will then occupy an honoured place in a glass case upon my mantelpiece. The great man is renowned for his happy knack of making pithy remarks appropriate to all occasions. That uttered when I held open the door of his taxi was no exception to the rule. "Paddington," he said, sinking into his corner.

High-Frequency Choking

Todding into the Ritz to see if there was anybody there who might stand my lunch I came across the genial Captain Chuckersley in the act of engulfing oysters. "Ecco!" I cried, bursting into Italian and slapping him upon the back. "Ecco!" he screamed as soon as he was able to speak after dealing with an oyster that had taken the wrong turning: "Please don't do it."

No Luck

Entering Bush House, I sauntered jauntily into the Editorial sanctum and was promptly pushed out.

An Old Friend

Crossing the Strand I made my way into Simpson's, where the very first person that I saw was my old friend Professor Goop. Just as I arrived at his table he was raising his voice to anathematise the waiter. "No less than an hour ago" he shouted, "I ordered a chop lightly done. Will you tell me why on earth you have not yet brought it—or have I eaten it?" The waiter having assured him that he had duly put away his chop, Professor Goop was about to rise from his table when I pointed out that I should be delighted to lunch with him. "In that case, my dear fellow," he said, with a beaming smile, "we will begin all over again—waiter, two chaps—and now let me show you my new circuit. This coil represents a centre-tapped inductance, whilst here (he picked up a fork) we have a neutralising condenser. This coil is a 1,000-ohm resistance and the ash tray is a choke with a value of one millihenry. We will test this coil to represent the valves." He took his own and mine, but as he was still two short he went across to a table on his left and borrowed two foaming beakers. The owners of these were still arguing the point when the Professor, who was apparently entirely deaf to their entreaties, discovered that he had nothing to represent the high-tension battery.

A Sad Shock

He was just sallying forth in search of this when the manager arrived, supported by two stout fellows, and before you could say Llanfair... gogogoch, the Professor and I found ourselves outside on the pavement. I did not mind this so much, but the most unkind of all was that the Professor complained that the rough treatment he had received had entirely taken away his appetite, the result being that I had to go and buy my own lunch.
SEE that a suggestion was made recently by a French scientist that the services of wireless might be utilised to regulate the clocks in observatories in all parts of the world. With modern appliances an accuracy of one-thousandth part of a second can be assured in the checking of time. The idea of thus synchronising the clocks of the world is certainly intriguing, but it must be remembered that such a system would presumably be finally dependent on some one master clock, with which the others would be synchronised. One foresees that complications might arise if the master clock failed in its duties!

T appears that the B.B.C. are contemplating ambitious educational schemes. Mr. J. C. Stobart, speaking at a conference in Cambridge of the British Institute of Adult Education, outlined as a possibility of the future a regular series of half-hour broadcast educational talks; these would presumably be followed at intervals by examinations in the subjects discussed. This would enable the listener to acquire learning without leaving his own fireside.

Such a scheme would be dependent on the provision of definitely alternative programmes, so that listeners would not feel that they were being "forcibly fed" with educational talks.

BESIDES the National concerts which are being organised by the B.B.C., a series of international concerts is to be given on the first Tuesday of each month. The music of the following countries will be heard during the coming winter season: — November, Italy; December, Germany; January, France; February, Czecho-Slovakia; March, Holland.

DURING the past few years little radical alteration has been made in the electrode design of three-electrode receiving valves. Of different shapes, sizes and materials, there is a great variety, but the generally "accepted" relative disposition of electrodes has remained unchanged. Designers are, on the other hand, constantly endeavouring to modify and improve on the construction of the filament, and one design which has recently been patented aims at doing away altogether with the conventional filament-heating system.
In this new valve the arrangement of the electrodes, too, is altered, the filament being outside the grid and anode. The "filament" cannot strictly bear that name at all, since it consists of a cylinder coated to improve emission of electrons. This cylinder is heated by means of an electric heater, which presumably may be supplied with current from the mains or some similar source. Something of this nature has been attempted previously in valve design and it remains to be seen whether this new patent will prove to be a sound proposition.

It is curious what a number of people appear to imagine that it is unnecessary to take out a wireless licence until the set is in working order. There have been several cases in the courts lately when the plea was put forward that the set did not work, so that no licence was taken out. The regulations state, of course, that a licence must be taken out before the apparatus is installed.

A point which was noticeable at the National Radio Exhibition this year was that there appeared to be much more "courage" displayed in the design of receivers than hitherto. I mean by this that there seems to be a movement towards making the wireless receiver a piece of furniture, designed on sufficiently attractive lines to allow it to take its place naturally in a room. There will probably always be a certain number of people who like to hide the receiver in some way, often by dressing it up as though it were something else. On the other hand, now that the receiver is becoming, or rather already is, accepted as a necessity and is no longer regarded as a toy, it is only to be expected that the majority of listeners should wish for an instrument which will be no more conspicuous among the furniture than a piano or a gramophone.

Some very attractive cabinet work was to be seen at the Exhibition, the increasing use of wooden panels and "fall-fronted" cabinets helping to make the receiver blend with other furniture in a manner which is hardly possible when ordinary black ebonite is there to catch the eye.

It is becoming the accepted practice in many modern receivers to use one rheostat, or better still, one fixed resistor, to regulate the filament current of more than one valve in a multi-valve set. In a set using two stages of high-frequency amplification, for example, if similar valves are used for both stages, one resistance may quite well be used to control the two. This leads to a slight difficulty when it comes to neutralising the high-frequency stages, assuming as a matter of course in these days that they are neutralised. Each stage has to be dealt with separately, and in the older style of receiver each valve would be turned out separately on its own rheostat. It is possible to remove the valve and wrap a piece of thin paper round one of the filament legs in order to prevent it lighting. This, however, is not always easy to do, and if a burnt-out valve of similar type to that in use is available this may be used to get a rough adjustment of the neutralising condenser.

The procedure is to insert the "dud" valve in the holder and set the neutralising condenser in the ordinary way, after which the proper valve is replaced and any small extra adjustment is made. Slight differences in the spacing of the electrodes of the two valves will probably prevent the setting obtained in the first instance from being absolutely correct, but an approximate setting may readily be found in this manner. The final adjustment can then be made by rotating the tuning controls in step and noting whether oscillation occurs at any point.
"ELSTREE SIX" WINS WORLD'S CHAMPIONSHIP

Radio Press Star Design Gets Premier Award in Dutch International Competition

Amateurs of all nationalities were invited to submit wireless apparatus constructed by themselves for competition in the International Radio-Amateur Festival, held in Amsterdam between September 18th and 26th. The aim of the Amsterdam Radio Society, organisers of the festival, was to encourage the spirit of good will between Dutch radio amateurs and their friends in all countries.

The result of this international competition, open to the world, has gained for a Radio Press reader and a Radio Press design the first place. THE GOLD MEDAL OF THE COMPETITION, THE HIGHEST DISTINCTION POSSIBLE, HAS BEEN AWARDED TO AN “ELSTREE SIX” set, entered by Mr. R. W. Emerson, of 3, St. Ann’s Terrace, St. John’s Wood, London, N.W.8. Mr. Emerson is interested in the construction of wireless sets purely as a hobby, being engaged in the business.

THE “ELSTREE SIX” ENTERED FOR COMPETITION WAS IDENTICAL IN LAYOUT AND CONSTRUCTION WITH THE ORIGINAL “ELSTREE SIX,” the Radio Press Star Set of which a full description was published in the June issue of “Modern Wireless.”

THE WINNER TELLS HIS STORY.

I have been asked by the Editor if I would give Radio Press readers an account of my visit to the Amsterdam Radio Exhibition, also as to why I chose the "Elstree Six" for the competition.

First of all, as to why I chose the "Elstree Six." When the basis of this circuit appeared in Wireless Weekly on April 7, 1926, Vol. 8, No. 8, I was rather impressed with its possibilities, especially as to the elimination of the parasitic oscillations which are sometimes present in split coil neofrodyne circuits, but I decided to wait a little (as I was still experimenting with another receiver) to see if Radio Press went any further with this, and I was very pleased to see it arrive in the circuit of the "Elstree Six" which appeared in the June number of Modern Wireless. I then decided to leave the other set and make up one stage of H.F. on this principle before making the set, to see how it functioned, and I then tried it in front of a five-valve set, and found it quite good and stable. This settled it, so I started and
made a set of coils, and built up the set; but, unfortunately, my first attempt was a complete failure, as I was only guided by the wiring diagram, and as I did not get the exact distance between the coils the set failed absolutely to neutralise. Eventually I was able to obtain a full-size blue print, and I made the set again after measuring this, and when it was finished and I had put the last wire on and connected up, it neutralised first time. Although my aerial is screened on all sides and 60 ft. long, and no down lead at all and an earth lead of about 40 ft. to an earth tube, I can hear Bournemouth any day free from London and as loud, and only being one mile away from 2LO's aerial, I think this speaks very highly for the set. I have a choice of 30 stations any evening, weather conditions permitting, and I have tuned in over 40 stations on the loud-speaker.

The tuning is fairly sharp but easy, as the dials can be set to give the same setting for each condenser, and I would advise any reader who is in doubt as to what set to make to set about it now and make one, and I am sure they will not be sorry. If any such reader lives within riding distance of my house, I should be pleased to demonstrate this set to him, and give him every assistance to make a success.

The Visit to Holland

Now regarding my visit to Holland, I was very much surprised to receive a message to the effect that I had won premier prize in the International Competition, which was the gold medal, and I thought it only right that I should go over and receive this signal honour at the hands of the Society, so I wired to the Secretary to the effect that I would come over to receive same, also to bring greetings from British amateurs. I arrived at Amsterdam at 8.30 a.m., where I was met by the Chairman and components being either German or American, but there were a few British parts there; also loud-speakers. During the afternoon I was taken round the town and shown the interesting parts, also the Rembrandt Galleries, by Herr Kroon, and after the exhibition was entertained by several of the exhibitors at the Hotel American, where the health of the British amateurs was toasted, and hopes expressed that the relationship between the Dutch and British amateurs would be more firmly united.

During the evening I proposed giving a special demonstration of the "Elstree Six" for the benefit of the exhibitors and public, but although I tuned in several stations, atmospheres were so bad that reception was absolutely spoilt, but they heard sufficient to show the capabilities of the set, and I made several of the persons present work the set themselves, and as a result I have got to send sets of parts to assemble there for demonstration purposes! I was unable to repeat this on Tuesday, as the set had to be packed ready for despatch to London on Tuesday morning.

A Final Message

I should especially like to thank Herren Verkoeven, Nassau, Tooren, and Bontkoe Irving for the way they did everything to make my
"Willing to Demonstrate"

Sir,—Further to my letter re my results with the "Elstree Six," which you published in the August number of Modern Wireless, I would like to state that I am willing to demonstrate my "Elstree Six" to anyone interested (by appointment, of course). I have already had some twenty or so visitors, and all have been delighted with the results, followed by wholesale scrapping of old sets and the building of "Elstree Six" sets. If you care to make my offer known to your readers I will do my best to give any assistance possible.—Yours truly,

Sidney John Aland.
9, Kilmaine Road,
Fulham.

"Every Station"

Sir,—As a dealer I was interested in the reports of the "Elstree Six" and its claims for selectivity and distant reception and the ability to tune in so many stations on the loud-speaker. I obtained the necessary components exactly to specification and assembled these, with the result that I am able to tune in every station, both long and short wave, on the identical condenser settings as given in Modern Wireless of June and July.—Yours truly,

Mervy Wimborne.

"Very Satisfactory"

Sir,—Re results obtained from the "Elstree Six," I am pleased to state that this receiver has been working now for a month and the results obtained, up to the time of writing, are very satisfactory. I have certainly not yet received 70 stations, but I feel quite sure that with a little more practice, the number of stations I receive will compare very favourably with the number of stations that the set is claimed to receive.

May I mention that I have been a constant reader of both the Modern Wireless and Wireless Constructor, having built several of your designs.—Yours truly,

W. Harvey.
Gateshead-on-Tyne.

"Almost Incredible"

Sir,—I have just returned from the Channel Islands, where I have been demonstrating the "Elstree Six." This receiver is the finest I have yet handled for simplicity of working, and the way station after station can be tuned in is almost incredible; as regards

Part of the apparatus used at the weather forecast bureau at Washington, U.S.A., by means of which weather forecast maps are transmitted and received by wireless.

An article is being prepared giving further details, operating notes, etc. of the screened coil superheterodyne described in our last issue. It was unfortunately impossible to include it this month, since it is desired to give details of the results obtained with a number of makes of intermediate transformers, some of which are not yet available for testing.

Volume and purity of tone, everyone who has heard it agrees that they have never heard its equal. The receiver, as I have proved by my demonstrations, is fully up to your claim for it. All BBC stations could be heard quite clearly for over 300 yards away.

Wishing you every success, and I hope for nothing better than the "Elstree Six."—Yours truly,

Stoke Newington. C. Wilson.

542
Treasures which crumbled at a touch

NOT so long ago the whole world was thrilled with the accounts of the exquisite treasures being exposed to the light of day at Luxor. Superb jewels worth a king’s ransom—marvellous carvings typical of the splendour of the Pharaohs—gorgeous sepulchral furniture—and most wonderful of all, tapestries and draperies which, until they were moved, retained the beauty and freshness of the day they were woven.

But—whilst the jewels, the carvings and the furniture have now been added to the museums—the fabrics and the tapestries have gone for ever. Their delicate, gossamer-like threads could not withstand even the most careful handling. After thirty centuries, the fibres had lost their pliability—at a touch they shivered into a thousand fragments.

This tragedy of crumbling treasures affords a striking parallel for wireless enthusiasts. Once the filament of a valve is crystallised with age it is liable to become fractured at the slightest blow. Even the ordinary wear and tear of everyday use will shorten its life. Now, however, a filament has been discovered which—because it operates almost without heat—permanently retains its pliability: Age cannot affect it. Even after several thousand hours of use its electronic emission is as prolific as ever. This Kelvinised filament is one of two vital improvements introduced by Cossor this season. The other is Co-axial Mounting—a system of construction acknowledged to be one of the greatest steps forward in valve design for several years. Ask your Dealer to-day for our latest Folder describing the many exclusive features of these new valves.

Read about their amazing economy—their greater sensitivity and improved tone, but above all, their guaranteed uniformity of performance. Never before have such remarkable valves been available.

The new Cossor Point One
With Black Band. An ideal supersensitive Detector. Consumption ‘1 amp. at 1 1/2 volts 14/-

The new Cossor Point One
With Red Band. Pre-eminent among H.F. valves. Consumption ‘1 amp. at 1 1/2 volts 14/-

The new Cossor Senor Two
With Green Band. For Power Valve use—ideal for Super Sets. Consumption 1 1/2 amp. at 2 1/2 volts 18/6

Cossor Valves
FOR PERFECT RECEPTION

POPULAR CONDENSERS
The "Popular" condenser, owing to its design, provides a precision corrected square law condenser at a low price. The motor is electrically connected to the girders and plates, while the fixed plates are held at four points by baleen insulators. Supplied with 3-in. dial.

| M.P. | | 10/- |
| M.F. | | 10/6 |

COIL SCREENS
These coil screening boxes provide a very efficient method of utilizing screened coils. The sockets are standard. The box is of polished aluminium and screws into the base screen, thus providing a perfect electrostatic screen.

| Screen and Base | 15/- |

JACKS
The introduction of Bowyer-Lowe jacks provides the wireless constructor with components which are far superior in design and manufacture to anything hitherto available.

| Single circuit, open | 2/- |
| Single circuit, closed | 2/- |
| Double circuit, closed | 3/- |
| Filament, single control | 3/- |
| Filament, double control | 3/- |

GANG CONTROL CONDENSERS
This condenser has been designed for use in single control receivers and is provided with three independent condensers of 0.005 M.F. capacity, insulated from one another but controlled from one dial. A simple means is provided for varying the relative positions of the rotors so that the different coils and transformers can be balanced.

| With 4-in. dial | £3 13 0 |
| Without dial | £3 10 0 |

H.F. TRANSFORMERS
These transformers are section wound with the Primary and Secondary loosely coupled, and are highly efficient. The primary is tided by means of a 0,001 M.F. variable condenser to the wanted range. Every transformer is matched to a standard and no particular selection is needed for multi stage H.F. working.

| Each | 9/- |

H.F. CHOKE
The graduated sizes of the air core high frequency chokes available in this series enables the best size to be selected for any circuit, as changes can be very quickly made. The chokes are machine-wound of low self capacity, while the sizes will cover most needs of the amateur.

| Each | 2/- |
| Base for Chokes | 1/- |

ANNOUNCEMENT BY THE BOWYER-LOWE CO., LTD., LETCHWORTH, HERTS.
Here are many readers who have by now constructed the "Solodyne" and are obtaining their first results with this receiver. As far as can be seen at present little difficulty is being experienced in obtaining satisfaction, but there appears to be one or two small points upon which further information is desirable.

One of the queries which is often raised is that of the reaction control. This at times is inclined to be "ploppy," and not to give the full and progressive increase of signal strength which is desirable. This will be found in practically every case to be due to the fact that the receiver has not been properly balanced up.

Balancing

In last month's issue instructions were given concerning the method of balancing up and neutralising this receiver. It will be remembered that the sequence of operations was briefly as follows:

1. Tune to the local station.
2. Adjust aerial condenser until aerial circuit is approximately in tune.
3. Neutralise the first valve by removing the fixed resistor and adjusting the neutralising condenser until a zero is obtained.
4. Neutralise the second valve in a similar manner.
5. Tune in to a distant station.
6. Balance up all the circuits again.

Now it is in this final balancing up that the satisfactory operation of the receiver is obtained. With an approximate balance it is possible to obtain quite a variety of stations, but they lack the kick and volume that one would expect, and moreover the reaction control is not smooth and progressive.

An Interesting Point

If this is found to be the case, then a little more care should be taken in the balancing operations. It may be that several attempts have to be made in order to obtain a final state of affairs, but this is a matter which will quite easily be found by trial. As a matter of fact, again to the balancing of the various condensers, and after re-adjusting them some three or four times, tuning in different stations on which to re-balance, we found that the trouble really lay in this aspect of the question.

Choosing Distant Stations

It is essential to choose the distant station which is crisp and clear cut. This nowadays is a matter of some difficulty owing to the continual heterodyning which is only too prevalent. It is usually possible with a little care to find some station somewhere about the middle of the dial on which the tuning is sharp and well defined, and on this station the balancing operation should be carried out.

Particular care should be paid to the balancing of the second and third condensers. The aerial condenser can always be balanced quite easily, but the other condensers are apt to be a little critical. The definite test as to whether the circuit is properly balanced up really lies in the reaction control, and it will be found that when the last two circuits are correctly adjusted the reaction will cause a progressive and smooth increase in signal strength until the receiver finally oscillates.

Aerial Circuit

The aerial circuit also affects the reaction control to a small extent, but this can be slightly out of balance without causing serious trouble. We have dwelt upon this subject at some length because this is really the only part of the operation of the receiver on
which any trouble is likely to be experienced, and it is simply a matter of time and care for the correct results to be obtained.

Triple Condensers

Many other makes of triple condensers have been placed on the market, and although, as was stated in last month's issue, many of these appear to fulfil the necessary conditions, it was thought desirable to make a definite trial of these alternative condensers before definitely recommending them for use in the "Solodyne" receiver. This has been done in the case of several of the alternative condensers, while certain others are at present undergoing test and will be reported on next month.

Cylind Condenser

This condenser is made up by mounting three standard Cylind condensers on an ebonite base plate. Each of the condensers is provided with a long rocker arm, all of these being linked up by a solid rod. Thus the rotation of the first condenser carries with it the other two. Independent adjustment of each condenser is possible by unscrewing a set screw and advancing or retarding the condenser by means of a tommy bar. The adjustment in practice was found to be quite simple, and the results obtained with this condenser were very satisfactory.

Three-hol fixing is provided with a special support to take the weight of the remote end. Any tendency to hand effect is avoided by an earth shield which completes a well-constructed unit.

Ormond Condenser

This condenser comprises three Ormond units mounted in a skeleton chassis, and provided with an insulated coupling between the several condensers. By undoing the screw and rotating the spindle of the condenser in question with the tommy bar provided, the condensers may be balanced up as required. Feet are provided to take the weight of the end of the condenser, single hole fixing being utilised at the panel end. An earth shield is also provided to avoid any tendency to hand effect. Self-aligning ball-bearing construction is adopted, and the whole makes a very neat and useful component.

Utility Condenser

This unit is made of three standard Utility condensers linked together by a special coupling device, which is so designed as to permit the variation of the settings of the condensers relative to each other. It is mounted in a suitable chassis and gives quite a neat arrangement which can be used quite satisfactorily.

Igranic Condenser

Messrs. The Igranic Electric Co. have submitted to us a 'gang' condenser for use in the "Solodyne" which uses a somewhat different principle of compensation. The arrangement consists of three standard condensers mounted up in a gang, while two small balancing condensers are connected across the second and third condensers respectively. It is suggested that these two condensers may be set to a value which will duplicate the effect of the aerial capacity connected across the tapped portion of the first tuned circuit. At the same time, if there is any slight discrepancy between the second and third coils, it can be allowed for by means of this balancing condenser.

Provided that these three coils used for tuning purposes are accurately matched, as is in fact the case with the commercial screened coils, then this method of compensation appears to be quite sound, and in actual practice this has proved to be the case. This condenser has been tried in an actual "Solodyne" receiver and has given results equably as good as those obtained with the original method of compensation.

The method has the advantage that either Square-law or S.I.P. condensers may be used, whereas this is not the case with the ordinary method of compensation by rocking the rotors of the various condensers.

The L.F. Side

With the "Solodyne" receiver, as with the "Elstree Six," the low-frequency side is quite standard, and can be altered if desired by the constructor. For example, some constructors may prefer instead of using a volume control to insert jack switching so that they may cut out the last stage altogether. This has been tried out experimentally and is perfectly satisfactory.

LATE NEWS.

THE "SOLODYNE" IN CHICAGO.

Following on the result of the success of a Radio Press Star Display at the World's Fair, New York, we have received cabled news of further interesting successes at Chicago. From the meagre information at hand it would appear that a "Solodyne" receiver constructed by Mr. Ansphach, of Dartford, Kent, has won a first prize, and that the "Moffet," set out by Master J. A. E. Black has secured the second award. Mr. Ansphach, who has for many years been an enthusiastic home constructor, occupies a position of responsibility in the works of a well-known manufacturing chemist, and Master Black needs no introduction. These results are of course, subject to written confirmation, and further details will be given in our next issue.

546
Build your own loud speaker

GONE ARE the days of troublesome 'phones. The LISSENOLA brings loud speaker convenience to every home at a record in low price. For 13/6—less than the cost of headphones—you can buy this wonderful loud speaking unit, needing only the addition of a horn to make it a powerful, full-sized instrument yielding results equal to an expensive speaker. And you can build a horn yourself—with each LISSENOLA we give you full size exact patterns and clear instructions how, for a few pence, you can build a big horn of proved efficiency. In addition, the LISSENOLA will fit the tone arm of any gramophone. The secret of this efficiency rests in the remarkably effective manner in which the electro-magnetic sound-reproducing system is concentrated.

Compare the price last
—before you buy go to your dealer and make this test: Ask him to put on the best loud speaker he has in stock—then use the same horn on the LISSENOLA, and see if you can notice any difference.

THE LISSENOLA
Now no home need lack a loud speaker.

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" instantly converts any gramophone into a loud speaker.
The "Listener" diaphragm loud speaker attachment (pat. pending) for use with any diaphragm loud speaker. Price, 1/-

Tell the Advertiser you saw it in "Modern Wireless."
Amperite
"means right amperes"

A BASIC NEED IN EVERY CIRCUIT

Write for
FREE
24 page circuit booklet.

there is an amperite for all standard valves.
the free booklet will give you full information.

AMPERITES ARE SOLD BY ALL HIGH-CLASS DEALERS.
If unable to obtain write direct to:

ROthermel radio corporation of Gt. Britain LTD.,
Telephone: 24-26, Maddox street, Regent Street,

Tell the Advertiser you saw it in "modern wireless."
Have you a stock of general-purpose valves which you want to use in a loud-speaker set? Here is a design for a receiver which employs such valves throughout and yet gives really good loud-speaking.

The purpose of the receiver to be described is to enable the local and Daventry stations to be received at loud-speaker strength up to distances of 15 and 100 miles respectively. This does not necessarily mean that the instrument is useful only for this class of work, for by using telephones instead of a loud-speaker many of the Continental stations can be tuned in at good strength.

A Question

It is possible that some readers will ask themselves why push-pull amplification is used in this particular set, since the low-frequency stages are preceded only by a detector valve. It is true that the grid swing with this arrangement in normal circumstances is not so great as would justify the use of push-pull amplification and power valves, but the present arrangement allows, and is intended to allow, the use of general purpose valves throughout in order to produce results which are not appreciably different from those given by power valves when used in an ordinary straight L.F. amplifier.

The Transformers

The transformers used in this form of amplification are different from those usually associated with low-frequency work in that the first is arranged with a split-secondary while the second has a split primary, there are therefore five terminals on each transformer instead of four.

Use as a Family Set

The receiver as illustrated has been in use for some weeks now as a family loud-speaker set, and for this purpose has been used with three .06 valves and an 80 volt high-tension battery.

The simplicity of the panel and the fact that an "on and off" switch is incorporated renders the receiver particularly suitable for use by womenfolk who, so far as
my experience goes, are usually somewhat frightened of more than one kind; visions of burnt out valves and other disasters looming largely in their minds should they touch the wrong one.

Reaction is incorporated in the set and is controlled by a small condenser of the neutralising type, and in order that there may not be any difficulty in making the receiver oscillate with this small condenser when various valves are used a variable grid leak is also provided.

**Points in Design**

In order that the set may be reasonably selective for those occasions when it is desired to listen to distant stations on telephones, the receiver is designed for use with "fieldless" coils of the plug-in type, thus allowing an inductive coupling to be used for the aerial circuit. With the exclusion of the aerial, earth and loud-speaker grid leak, the form of reaction used is, it will be seen, of conventional type and is controlled by the condenser situated between the radio-frequency choke and one of the ends of the coil $L_2$.

The first transformer will be noticed is arranged with a centre provided, the centre point being connected to the H.T. positive. The two ends of the primary windings are each taken to the plates of the low-frequency windings, while the loud-speaker is connected across the secondary winding.

It will be further noticed that the I.F. valve filaments are controlled by a common rheostat, and since this is done for simplification, it is recommended that the valves $V_4$ and $V_5$ be of the same type, particularly as a common grid bias is used.

**Components and Materials**

There will be found separately a list of components and materials used in the set as illustrated, and though it is not advised that values where given be departed from, it may be taken that other suitable components will be found in the advertisement pages with the exception of the transformers, these being of special type only.

**COMPONENTS REQUIRED**

- Cabinet to take panel and baseboard, 11 in. by 8 in. by 4 in. (Camco).
- "Duvarileak" variable grid leak. (Dahbler Condenser Co., Ltd.).
- "Neutravenna" condenser. (Gambrel Bros., Ltd.).
- 0.003 fixed condenser. (Dahbler Condenser Co., Ltd.).
- 0.005 S.L.F. condenser. (Ormond Engineering Co., Ltd.).
- Three "Lotus" valve-holders. (Garnett, Whitely and Co., Ltd.).
- Two "Push-Pull" transformers. (Radio Instruments, Ltd.).
- Two baseboard mounting rheostats. (A. F. Bulgin and Co.).
- One "Fieldless" coil and six socket base. (Eisen, Ltd.).
- Radio frequency choke. (Varley Magnet Co.).
- Panel brackets. (Burne-Jones and Co., Ltd.).
- Quantity No. 16 "Glazite" and wood screws.
- Ebonite terminal strip, measuring 6 in. by 2 in. by 3/16 in.
- Two "Push-Pull" transformers. (Radio Instruments, Ltd.).
- Two baseboard mounting rheostats. (A. F. Bulgin and Co.).
- One "Fieldless" coil and six socket base. (Eisen, Ltd.).
- Radio frequency choke. (Varley Magnet Co.).
- Panel brackets. (Burne-Jones and Co., Ltd.).
- Quantity No. 16 "Glazite" and wood screws.
- Ebonite terminal strip, measuring 6 in. by 2 in. by 3/16 in.

tapping which is connected to the grid bias negative, the two ends each being connected to the grid of a valve; this particular transformer is called the "input" transformer.

The second transformer is different from the first in that instead of having a centre tapped secondary, it is the primary which is thus provision recently placed upon the market.

The tuning condenser used is fitted with a slow motion device, and in distant reception this refinement will be found exceedingly useful; the receiver can, however, be easily operated quite satisfactorily without using this device.
Still further triumphs for CYLDON Condensors

1. Premier Award. Mr. R. Waldo Emerson, who was awarded the International Gold Medal for 1925 by the Amsterdam Radio Society for hi. "Elstree Six" has written in saying that his success was due "in great measure" to his use of "CYLDON" Condensors.

2. Second Prize. Radio World's Fair, New York, September, 1926. 2nd Prize awarded in senior section of the Junior Competition for a "Mewfelx" Receiver fitted with "CYLDON" Condensors.

3. Third Prize. Radio World's Fair, New York, September, 1926. 3rd prize awarded in the multi-Value Class in the International Competition for the "All British" Set. "CYLDON" Condensors and Tempreyes were fitted.

The above competitions were open to the world—
including American and European receivers. Verba sap.

Three Popular "Cyldon" Condensors

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<th>Type</th>
<th>Price</th>
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<tr>
<td>Triple-gang Condenser</td>
<td>£3 - 10 - 0 without dial.</td>
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<tr>
<td>2-gang Condenser</td>
<td>£2 - 10 - 0</td>
</tr>
<tr>
<td>4-gang Condenser</td>
<td>£4 - 10 - 0</td>
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</tbody>
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Get all particulars of all CYLDON Products from your dealer or write direct to the makers. Other CYLDON Condensors comprise Square-Law, Square Law Dual Pattern, and the S.L.F. model 4-in. Knob Dial, supplied free with Square Law and Dual Models, and 24 extra with S.L.F. or 2, 3, and 4-gang models.

CYLDON
(pronounced Sil-don)

SYDNEY S. BIRD & SONS
"Cylon" Works, Sarnesfield Road,
Enfield Town, Middlesex.
Telephone: Enfield 0672.
The Triple Gang Condenser

**IGRANIC CENTRE TAPPED "XLLO'S"**
*(EXTRA LOW LOSS)* COILS.

Igranic Centre-Tapped "XLLO'S"

Coils are particularly suitable for modern neotrodyne circuits.

Igranic Centre-Tapped "XLLO'S"

Coils actually contain two separate inductances, which may be used separately or may be joined in series to form a simple coil from which a centre tapping may be taken.

Five sizes, giving wavelengths of approximately 110 to 3,500 metres.

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<th>7/4</th>
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PRICE... ... ... ... ... ... £3 15 0

PRICE without equalising condensers, but with adjustable couplings... ... ... ... ... ... £3 10 0

Igranic Triple Gang Condensers are built up from three Igranic-Pacent .0005 mfd. Square Law Condensers. The whole construction is particularly robust; losses and minimum capacity are negligible, and the movement is extremely smooth.

The Igranic Indigraph Vernier Knob and Dial is particularly recommended for tuning. PRICE... ... ... 7/6

See the full range of Igranic Radio Devices at Stand No. 59, Manchester Wireless Exhibition, Oct. 26 to Nov. 6

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Tell the Advertiser you saw it in "MODERN WIRELESS."
Wiring in Imagination
With all the components collated together and the panel drilled in accordance with the instructions laid out in the drawing illustrating the panel layout, arrange the components upon the baseboard in such a manner as to simplify the wiring. Do not, of course, depart from the layout given, but make sure that the components chosen are placed the best way round for any connections before securing them to the baseboard. Imagine the connections between the various points and make up in your own mind the most attractive manner in which to wire up. If the components as listed are used, then, of course, all that is necessary to do is to copy the practical wiring diagram.

Connecting Up
The wiring up of the receiver in such a manner as to produce the theoretical circuit illustrated is but to copy the directions given in the wiring diagram. The connections to the "fieldless" coil base are numbered and the terminals 4 and 5 should be joined together and regarded as the centre tapping of the grid coil L2. The layout is such that the grid terminals of valve holders come immediately opposite the ends of the secondary windings of the transformers, to which they are connected, while similarly the two anode terminals of the L.P. valves come immediately near to the ends of the primary winding with which they are connected.

The low-tension negative terminal is also used as the grid bias positive so the connection from the centre tapping of the "input" transformer secondary is taken to the only grid bias terminal so marked.

Care Needed
When actually connecting up every care must be taken to keep the wiring clear of the baseboard mounting rheostat, otherwise difficulty may arise when it is required to carry out any adjustment of these components; similarly the wiring to the base of the "fieldless" coil should also be done with care to ensure that the coil will not foul when it is inserted in its base.

This view of the components mounted on the baseboard will help the constructor in wiring up the set.
A "PUSH-PULL THREE"—(Continued)

The wiring to the valve holders and transformers should also be done in such a way as to give clearance to the valves when they are inserted, and though these are obvious points which everyone knows, they are nevertheless points which one frequently forgets in one's haste and enthusiasm.

Testing the Receiver

After the wiring has been completed and checked against the practical wiring diagram the batteries may be connected and the receiver tested for working.

First place in position the "fieldless" coil, turn the switch to the off position and connect the low-tension battery across the appropriate terminals. Insert the valves in their sockets and ascertain that the filament resistances give ade-

quate control of the brilliancy of the valves, not forgetting to turn the switch to the on position before doing so; in carrying out this test it should be remembered that the two low-frequency valves are controlled by a common rheostat.

Upon this part of the wiring proving correct, connect the two H.T. + terminals together and apply, say, 3 volts of the H.T. battery across the H.T. negative and either of the H.T. + terminals and note the valve as to any alteration in brilliancy; if there is any change, then the wiring must be incorrect and checked once more against the wiring diagram.

Assuming, however, that everything is satisfactory, remove the wire joining the two H.T. + terminals together and apply a voltage of about 60 to H.T. + 1 and 80 to H.T. + 2. Connect the positive of the grid battery to L.T. negative and the negative of the same battery to the G.B. — terminal, using as a start 4½ volts.

Turn the reaction condenser in an anti-clockwise direction as far as it will go, connect the aerial, earth and a pair of telephones to the appropriate terminals.

The photograph shown below will assist in following out the connections to the fieldless coil base.
HITCH YOUR AERIAL
TO A “STAR”!

We supply all RADIO PRESS “STAR” SETS either as finished Receivers or in parts for home-assembly.

The “ELSTREE SOLODYNE”
5 valves —
1 dial — 50 stations —

Every finished instrument bears the signature of Capt. W. R. TINGEY, A.M.I.E.E.
(late of Radio Press Research Laboratories), who is now in charge of our Test Department.

If you want an efficient and handsome receiver ready built, you cannot do better than purchase one of these “STAR” sets from us. They are designed by experts, made by skilled workmen and thoroughly tested on a large number of British and Foreign stations at full loud-speaker strength. These sets are installed free within 50 miles of any one of our branches.

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*Send three penny stamps for the new edition of our booklet giving illustrated details of any of the latest Radio Press Receivers. Much useful information on assembling, soldering and testing is also included.

Should you wish to assemble your own set — and there is no finer hobby for the long evenings — you can do so under our famous “ Pilot” Service, with every assurance that your efforts will be successful. Write for details of this service, and mention the type of set you want.

“The "All-British Six”

You will be delighted with the amazing results! This set built with our Copex “G.C.” type coils recently secured the highest award for by European sets in the International Amateur Competition held in conjunction with the New York Exhibition.

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Finished Instrument, royalty paid 23 10 0
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Other parts required 3 10 0
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If a complete set of parts is ordered, Marconi Royalties at the rate of 2 10s. per valde holder are payable.

MODERN WIRELESS

Improve your Set
with KEYSOE Components!

“Keystone” Neutralising Condensers.
A thoroughly efficient article, designed to suit the capacities of all types of valves. Beware of imitations which, owing to incorrect design, may not neutralise your valves properly. When ordering these condensers for a Radio Press “Star” set, please indicate which set you are building.

For board mounting
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6/6

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Similar in design to the above, but having two sets of fixed plates instead of one.

“Keystone” Fixed Resistors.
Our latest product. Recommended for all receivers which use fixed resistors. Available in the following types:

No. 4 for 45 amp. valves with 6 V accumulator.
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Price, complete with base: 2/6 each.

“Red Triangle” Panels make Perfect Sets.

One of these famous panels, guaranteed free from surface leakage, will improve reception on your set — and it will also considerably enhance its appearance. Panels cut to size and hold in acid- proof wrappers:

- Black, matt, both sides.
- Black, polished one side, matt.
- Both 1 in. thick.
- Mahogany, polished one side, 3/16 in. thick.

Price, 24 per sq. in., 9d. per sq. in.

N.B.—All Radio Press sizes kept in stock.

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The use of coloured insulated wires improves the appearance of a set and simplifies the wiring. “Keystone” wire is of the highest grade, well insulated, and supplied in the following colours:

Red, Green, Black, White, Yellow
to fit coils, any colour

9d. per dozen, assorted lengths

“Keystone” Super-Het.

Construcational Portfolio.
Before you commence building a Super-Het, send for this portfolio, which contains full-size blue prints of the famous Keystone 7 Valve Super-Het. With the portfolio we will send you free of all cost, the Keystone book, giving minute instructions for the assembly, wiring and operation of this superb receiver. All fully illustrated.

STOP PRESS

THIS MONTH’S SET.
The Drawing-Room Five, the Pull-pull Three, and other receivers described in this issue are available as finished instruments or in parts for home assembly in the same manner as the other sets mentioned on this page. Write at once for detailed price lists.

PETO-SCOTT CO., LTD.,
Head Office (Mail Order): 77, City Road, E.C.1.

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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

Tell the Advertiser you saw it in MODERN WIRELESS.
Adjusting the Voltages
By turning the variable condenser slowly throughout its range the local station will soon be tuned in at good strength, whereupon turn the reaction condenser ever so slowly in a clockwise direction until the receiver is just off oscillation. Should the set show no inclination to oscillate when the reaction condenser is turned, turn the grid leak knob either one way or the other until the desired effect is obtained. If, on the other hand, the receiver tends to oscillate too easily reduce the voltage connected to the H.T. +1 terminal until a smooth control is given by the reaction condenser.

Good results can be obtained with ordinary general purpose valves in the L.F. stages.

Keeping the H.T. + 2 terminal connected to a suitable tapping on the H.T. battery, tune in the local station to its loudest volume once more and adjust the grid voltage until signals are pure and clear, using as high a value of grid volts as possible without losing signal strength or spoiling in any way the results formerly obtained.

Operating the Set
Once the two filament resistances have been adjusted to suit the valves chosen the switch may be used as the only necessary means of switching off; similarly, after the correct high tension and grid voltage have been found these two need not be touched, subject to age and so on.

Tuning is performed by means of the variable condenser C, and stations should only be sought when the reaction condenser is set so that the receiver is well under control. In the event of the set being adjusted close to the oscillation point when it is desired to reduce the reading of C, then the reaction condenser should be turned a little in an anti-clockwise direction before doing so, otherwise it is conceivable that considerable interference will result from permitting the set to oscillate.

Valves
The receiver has been tried with valves of all types and makes, using 2, 4 and 6 volts as the low tension supply, and satisfactory results have been obtained with all of them. For purposes of general listening the receiver has for a long time been fitted with ordinary general purpose 506 valves for reasons of economy in filament current, with the relatively low H.T. voltage of 80 applied to the anodes of the low frequency stages.

(Continued on page 622.)

WIRING INSTRUCTIONS
Join one side of R2 to contact 1 of S; contact 1 of S to terminal 4 of L2; terminal 4 of L2 to one side of R1 and terminal 5 of L2.
Join contact 2 of S to LT -
Join G of V3 to one “ Grid ” terminal of T2.
Join remaining side of R2 to F- of V2 and F- of V3.
Join remaining side of R1 to F- of V1.
Join F+ of V3 to F+ of V2; F+ of V2 to LT +; LT + to HT - and F+ of V1; F+ of V1 to one side of R3.
Join earth to terminal 2 of L1.
Join aerial to terminal 1 of L1.
Join remaining side of R9 to one side of C3; same side of C3 to G of V1.

Join terminal 5 of L2 to remaining side of C3, and fixed plates of C1.
Join A of V1 to one side of L3; same side of L3 to fixed plates of C2.
Join terminal 3 of L2 to moving plates of C1; moving plates of C1 to moving plates of C2.
Join remaining terminal of L3 to “ Anode ” terminal of T1.
Join centre terminal of T2 to GB -
Join “ HT + ” terminal of T1 to HT +1.
Join remaining “ Grid ” terminal of T2 to G of V2.
Join A of V2 to one “ Anode ” terminal of T3.
Join A of V3 to other “ Anode ” terminal of T3.
Join one side of T4 to one loud-speaker terminal.
Join other loud-speaker terminal to remaining side of T4. Join HT + of T3 to HT + 2
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 MODERN 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 MODERN WIRELESS that Mr. John Scott-Taggart has already been a valve manufacturer. The present time is an appropriate one to know 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. John Scott-Taggart served from 1914 to 1919, first in the Seaforth Highlanders, and later in the Royal Engineers. Enlisting as a private, he was rapidly promoted to Sergeant-Instructor of Signalling.

He was later promoted in the field to commissioned rank, and was first in the results of every examination on valves held at the General Headquarters in France.
The Ormond S.L.F. Condenser is by far the best Condenser to use, and the markings on the dial enable you to pick up any station with the minimum of trouble and without any unnecessary calculations. Precise tuning adjustments with noiseless operation are ensured by the general sound construction of this newest ORMOND product. The famous ORMOND SLOW MOTION FRICTION DRIVE (Ratio 55-1) is incorporated and special ball bearings give liquid-like movement to every turn of the knob. This world-famous ORMOND component is easy to mount, having one and three holes for fixing, with both terminals and soldering tags for connections. If you have not yet received a copy of the new Ormond catalogue, write for one to-day.

**EXTRAORDINARILY LOW PRICES**

**Prices: With 4 inch Bakelite Knob:**

- .0005 microfarad - 20/-
- .00025 - - 19 6
- .00025 - - 19 6

**Prices: With Dual Indicator Dial:**

- .0005 microfarad - 21 6
- .00025 - - 21 6
- .00025 - - 20 6

Ormond S.L.F. Condensers are obtainable from all dealers.

Orders can now be taken for the ORMOND TRI-GANG CONDENSER eminently suitable for the Estere Solodyze Receiver. Price £2, complete with anti-capacity shield, knob and dial.

**THE ORMOND S.L.F. ENABLES YOU TO PICK UP STATIONS WITHOUT CALCULATIONS**

Tell the Advertiser you saw it in "MODERN WIRELESS."
LONG before Broadcasting was ever thought of in England, the name Brown was indubitably bound up with Wireless Headphones. On the high seas, ships' operators relied upon them to receive vital messages; on the fields of war, when thousands of precious lives depended upon messages going through, the army put their faith in Brown A type phones; the Navy, many other Government services, and the World's Cable Companies—all have for long chosen the Brown as the supremely sensitive and utterly dependable Headphone.

What better recommendation could you desire than the faith so many vital Services have placed in the Brown? Whether you buy the famous original A-type, the new A2 (unequalled anywhere at thirty shillings) or the popular Peacock, you know you are getting a headphone constructed on the same unique Brown principals, with the same Brown high standard of manufacture, and which, you can be sure, will give the same Brown incomparable service. Don't ask for Headphones—follow the experts' choice and say "Brown."

Brown

S. G. BROWN, LTD., Western Avenue, North Acton, W. 3.

Tell the Advertiser you saw it in "Modern Wireless."
Pioneer Work on Valves

As a wireless officer in the Royal Engineers, he took part in fighting on Viny 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, "On Characteristic Curves and their Use in Radio Telegraphy and Telephomy," 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 Basse 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 training of Army wireless operators is carried out on up-to-date valve apparatus.

The part played by wireless in 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 Standard Text Book

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

Without valves the production of the compact transmitter and receiver shown would have been virtually impossible.

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 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.
HEAD OF RADIO PRESS RETIRES—(Concluded)

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 second 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., and in fact prepared the original defence in the patent law-suit 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 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 ambition to 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 in 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 whole-heartedly 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 fitting 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. Reynier, 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.
A Name to Conjure with in the world of Broadcasting

HART BATTERIES

ENSURE
A marked increase in Volume of tone & freedom from distortion

says-'DE GROOT'
The Famous Violinist of the PICCADILLY HOTEL

There are models of "Hart" Batteries for all wireless circuits. Write to-day to Department M.W. 3 for illustrated leaflets and full particulars.

WE ARE EXHIBITING AT THE MANCHESTER WIRELESS EXHIBITION OCT. 26 to NOV. 6, STAND No. 42

HART

THE BATTERY OF QUALITY

HART ACCUMULATOR CO., LTD. STRATFORD LONDON E.15

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LEAVING GRID LEAKS ON OUR FACTORY ROOF TO TEST THEM

A case of Lissen Fixed Grid Leaks was left on the roof of the Lissen factory during the summer of 1925—five were soaked by rain, then baked by the sun—then they were banded over to the Lissen research department, and carefully tested. In every grid leak the resistance was found unchanged and true to the marked value.

All capacities, previously 1/8, NOW 1/- each.

DOUBLE PURPOSE VALVE HOLDER.
Can also be used for panel mounting by bending the springs straight—low cost, low capacitance, better, clearer signals.
Lissen Valve Holder, prev. 1/4, NOW 1/- each.

REAL RADIO SWITCHES.

There is a Lissen switch for every radio switching need. Your dealer has them all, or if any difficulty send direct.
Lissen 2-way switch, previously 2/-, NOW 1/6.
Series-parallel switch, previously 3/6, NOW 2/6.
Double Pole Double Throw, previously 4/6, NOW 2/6.
Key Switch, previously 2/6, NOW 1/6.

WON'T WARP, TWIST, BEND OR BREAK.

No chance of this with a Lissen wire-wound rheostat or potentiometer—no shorted turns—no development of faults in use—no chance of arcing, noise or flickering. And every contact brush of every Lissen wire-wound rheostat and potentiometer moves with firm and positive action along the wire, yet never harshly.

Previously high-priced but now largely reduced because of our new direct-to-dealer policy which cuts out wholesale profits.
NOW 2/6
Lissen 7 ohms wire rheostat, patented, previously 6/6, NOW 4/6.
Lissen 34 ohms wire rheostat, patented, previously 4/6, NOW 2/6.

EVERY ONE LISSON ONE-HOLE FIXING, TOO.

Insist on seeing a Lissen before you buy any other.

IMPORTANT TO THE TRADE

Retailers who have not already been notified of our new direct-from-factory-to-dealer distributing policy should in their own interests communicate with us without delay. All orders must now be sent to us at Richmond and not to usual factor.

Lissen Limited, Lissenium Works, 20-24, Friars Lane, Richmond, Surrey.

Managing Director: T. N. Cole.

A Musical Authority on A Musical Instrument

Mr. John Ansell, the well-known Musician and Conductor of the Wireless Symphony Orchestra, writes:

Gentlemen,

I am, frankly, delighted with my Curtis Double Circuit Super-Het 8, incorporating the Curtis Cabinet Loud-Speaker.

As a conductor and critical musician, possibly I expect more from a wireless receiving set than the average listener. It may interest you, therefore, to have my assurance that the volume and clarity of tone are indeed a revelation to me, whilst the wonderful selectivity of your Curtis set is proving most valuable.

The taste and exquisite finish of your "Windsor" cabinet model have already evoked the admiration of my many musical friends.

As advised by you I am using Hart Accumulators for both my Low and High Tension Supply, and these are functioning admirably.

Yours faithfully,
(Signed) John Ansell.

Then, for "A Revelation in volume and clarity of tone . . ."

BUILD YOUR OWN CURTIS DOUBLE CIRCUIT SUPER-HET 8 WITH

The Curtis Intermediate Unit

As complete component, consisting of the Intermediate Frequency and Filter transformers with corresponding valve sockets and accessories wired up, mounted in box and tested ready for use in any Supersonic circuit as a single unit.

HOME CONSTRUCTORS' TREATISE, 2s. 6d.

Containing Circuit diagram; 2, simplified layout and wiring charts; 3, Instructions for operation; 5, complete schedule of components.

GENUINE CURTIS PRODUCTS ALONE CAN GUARANTEE

That Perfect Quality of Reproduction with our unique system of SERVICE AFTER PURCHASE.

Peter Curtis, Ltd., 11, Red Lion Square, London, W.C.1

Telephone: Chancery 7194. Telex: "Percurtis, Holls.
Manchester - - 312, Deansgate.
THE "ELSTREE SIX"

Further hints on operation together with some notes upon suitable alternative components which have been tried at Elstree.

NUMBER of enquiries have been received from readers regarding the low-frequency side of the "Elstree Six" circuit. In some cases readers do not wish to utilise two low-frequency stages, but would be content with only one, or perhaps none. Others have enquired whether the use of low-frequency transformers specified is of any great moment.

As a matter of fact the low-frequency side of this receiver is absolutely straightforward and does not affect the operation of the high-frequency side to any extent. Those readers who wish to utilise either transformers in place of those specified may do so without any detriment to the operation of the receiver, provided that the transformers actually employed are of a reasonable standard of efficiency.

Alternative Transformers

One or two alternative transformers have been tried in the circuit. Two Ferranti A.F.3 transformers operate very satisfactorily. It is sometimes found that there is a tendency to whistle, but if this is the case, a leak of 0.25 megohms placed across the secondary of the second transformer will overcome this difficulty. Eureka transformers have also been employed in the circuit quite as successfully, while the well-known multi-ratio transformers made by Messrs. Radio Instruments provide a very useful combination in that the suitable tapping for the particular valve in use may readily be chosen.

These transformers are only a few of the suitable alternatives, and the fact that any particular transformer is not mentioned in this list does not preclude its use in the "Elstree Six." As has been previously stated, provided the transformer is of a suitable ratio and of sufficiently high standard it can be used quite satisfactorily.

Wavelength Ranges

Many readers have queried the apparent discrepancy between the results obtainable on the lower wavelength range, and that of the Daventry waveband. On the lower range the axis of the Dimic coils and the plug-in primary are approximately the same. Using the long range Dimics, however, with a standard form of plug-in primary, this is no longer the case, and in fact coupling between the two is somewhat weaker than is desirable.

This results in a certain weakening in the signal strength on the higher range, but this may be overcome by either raising the long-wave Dimic coils on extension pieces, so that the axis of these coils come in line with the axis of the plug-in primaries. Alternatively a much smaller plug-in primary coil may be used. Again, the primary coil may be of a very much smaller diameter, wound if necessary with a much finer wire. Home-made Hank-wound coils may be utilised, such coils having about 300 turns wound on a 1 in. diameter former. If these coils are then fitted with standard two-pin plugs they will be found to constitute quite satisfactory primaries for the longer range. Care should be taken to keep the direction of the windings of the primary coils all the same, and they should be so connected that the direction is the same as on the standard plug-in coils.

The "Unimic" Coil

Messrs. McMichael have recently produced an interesting coupling unit specially designed to replace the plug-in primary which was used in the original model. These coils, which are known as "Unimic" coils, consist of a small coil arranged to fit into a special form of rocking holder. By this means the actual degree of coupling between primary and secondary may to some extent be varied if it is found desirable.

For the shorter waves these coils consist of a short length of flanged tube similar to that on which the Dimic coils themselves are wound, carrying a single layer winding, while for the longer range the Unimic coil is similar to one-half of the Dimic coil for the particular range specified. By means of the mountings provided it is possible to maintain the axis of the primary and secondary coils the same both for short wave and the long wave coils.

Actually the winding is so designed that there is no danger of resonance between the primary and one-half of the secondary winding, the numbers of turns being suitably proportioned to avoid any effect of this at all. Unless this is done there is a danger of trouble due to unexpected oscillation in the circuit.

Dual Condensers

We have received other makes of dual condensers which may be used satisfactorily in the "Elstree Six" circuit. Messrs. Ormond Eng. Co. have produced a "dual" model of their well-known instrument which is quite suitable in this circuit, and Messrs. Burne-Jones have also submitted a dual condenser which has given satisfactory results.

The use of the specified H.F.
FURTHER HINTS ON THE "ELSTREE SIX"—(Concluded)

choke is not essential, and any of the various makes of high-frequency chokes now on the market may be employed in the circuit provided they are of adequate quality. The same remarks apply to the potentiometer, for which any well-made component will suffice.

Resistances

We have recently tried a set of four Mullard wire-wound resistances in the "Elstree Six" with entirely satisfactory results. The same remarks apply to the Dubilier wire-wound resistance, so that either of these two components may be used as suitable alternatives to the Varley resistances which were originally specified.

Filament Switching

Several readers have enquired as to whether it would not be possible to incorporate a filament switching jack in the last stage, so that the last valve may be cut out of circuit when not in use. This course is quite feasible, and in fact has been done in many cases with entirely satisfactory results. Since the last valve is provided with a separate filament resistor, no difficulty is experienced when this valve is cut in or out of circuit.

Fixed Resistors

In this connection the use of fixed resistances in the "Elstree Six" may be discussed. The original circuit included Amperites, which are a form of automatic resistance. They pass substantially the same current irrespective of any variation in the voltage of the accumulator within certain limits. The valve therefore passes its true current irrespective of the condition of the accumulator.

If fixed resistors are used then the adjustment of the filament current is automatic, only as long as the voltage of the accumulator remains at a volts per cell, when the valve will carry its correct current. The voltage of an accumulator, however, does not vary considerably in use, and for most practical purposes a fixed resistor is perfectly satis-

factory. The modern valve is sufficiently flexible to give quite satisfactory results over a fairly wide range of filament currents. The use of fixed resistors, therefore, in the majority of cases is quite permissible, and no loss of efficiency will be occasioned by their use.

H.F. Transformers

There is one point which has perhaps not been sufficiently emphasised in connection with the

Primary Coils

The arrangement therefore is very flexible, and the reader can suit himself as to the particular combination he uses. When endeavouring to receive stations operating very close in wavelength to the local station the coils in the primaries should be reduced in size until the requisite selectivity is obtained. If, on the other hand, it is desired to increase the strength of a distant station which is not coming through as well as is desired, then the size of the primary coils should be somewhat increased.

When receiving stations close to the local station in wavelength something must be sacrificed, either signal strength or selectivity, but once a little experience is gained in the handling of the receiver, the flexibility obtained by this interchangeability will then become appreciated. It is often found, for example, that the changing of one of the primaries only will make all the difference between satisfactory reception and doubtful signal strength or selectivity.

A Station for nearly Every Degree

SIR,—The results obtained with the "Elstree Six" are far beyond my expectations. For selectivity, distance and pure volume I do not think it will ever be improved upon.

As an example of selectivity, Madrid, Manchester, Bournemouth, Hamburg, Newcastle and Dublin are easily separated, and, for distance, Rome and Berne are a fair test. The neutralising, and tuning are quite simple compared with several smaller sets I have used.

Thanking you for your work in turning out such a fine set.—Yours truly,

W. N. BAYES

Congleton.

P.S.—I have logged a station for nearly every condenser degree between 38 and 118.
Distortion—visible or audible?

When little Willie takes photographs you must have noticed how the buildings often look as if they are falling down. Frequently this is due to the distortion caused by the use of an inferior and uncorrected lens. It is distortion made visible to the eye. But every wireless enthusiast knows the distortion which comes from the use of uncorrected L.F. Transformers. Just as an anastigmatic lens is scientifically corrected against distortion of every kind and is guaranteed to give a faithful image, so a Eureka Transformer is scientifically corrected and guaranteed to give faithful reproduction. It is a matter of precise mathematics and expert knowledge. The Eureka stands in a class by itself. It has no laminated core and its improved method of "stratum-winding" ensures greater volume with an even amplification of all frequencies. Again and again has it been proved to be the one L.F. Transformer which really "re-creates the living Artiste."

Eureka Concert Grand
A superb L.F. Transformer hermetically enclosed in a coppered steel case-proof against atmospheric influences. Its second stage is there to prevent distortion. Designed for work in concert partnership with the Concert Grand. Designed under identical principles.

Concert Grand 25/-

Eureka Baby Grand
For those who cannot afford the necessary higher price, the Baby Grand is introduced. Fully up to the same high standards of workmanship and carrying the same generous guarantee. Chosen by many manufacturers of wireless receivers.

No. 1 15/-
No. 2 15/-

Eureka L.F. Choke Unit
The L.F. Choke method of amplification is gaining in popularity among semi-professionalists. The Eureka Choke Unit, incorporating grid-leak and condenser is the finest instrument of its type.

Fully guaranteed 15/-

Sole Manufacturers of Eureka Radio Products

Re-creates the Eureka Living Artiste

Tell the Advertiser you saw it in "Modern Wireless."
The Secret of H.F. Efficiency

The success achieved by the Radio Press designs at the "Radio World's Fair" held in New York in Sept. 1926 (open to all comers) is now common knowledge. The Mewflex, one of the winning designs at New York, includes in the specification the MICA Balancing Condenser.

The secret of H.F. Efficiency is correct balancing of the valve capacities. The unique design of the Balancing Condenser incorporates the following advantages in a compact and highly finished unit at a moderate price:

1. High insulation resistance, so that no losses are added to the circuit.
2. High breakdown voltage, to eliminate risk of burnt out valves and ruined high-tension batteries.
3. Calibration to allow of re-setting to suitable values.
4. Precise adjustment, to enable the critical operation of balancing to be effectively and easily performed.
5. Ease and adaptability in fixing for either baseboard or panel mounting.

PRICE 4/9 EACH.

Demand MICA Components if you seek efficiency.

BRITISH, BEST AND CHEAPEST IN THE LONG RUN.

L. McMichael Ltd

Manufacturers of Wireless and Scientific Apparatus

Wexham Road, Slough, Bucks

Tell the Advertiser you saw it in "Modern Wireless."
**“SOLODYNE” SUCCESSES**

Appreciations from readers who have built the well-known Elstree “Soloodyne” receiver. Two of them are willing to demonstrate its capabilities to any interested enthusiasts.

**Will Demonstrate**

Sir,—I am sending you a report on the Elstree “Soloodyne,” which I have just completed.

The set is certainly all you claim it to be, and I find the dial readings are practically identical to those published by you, and this has been a great advantage in identifying the numerous stations received. I will not enumerate them all as they correspond to the principal stations in your list.

Everything is quite straightforward, and anyone who can use a soldering-iron could make it successfully. I find that by removing the fixed resistors of the H.F. valves, and connecting the aerial to F.3 of the triple condenser, the set works as D, and 21F with reaction, and gives tremendous volume on the local station, and is capable of receiving such stations as Hamburg, Frankfurt and many others on L.S.

I am using Cossor valves for the first three and P.M. 25 for the last two, and am using R. I. multi-ratio transformers. I am limited to an indoor aerial and also have to take the earth wire out of the window and 20 ft. down to the garden, which is not exactly ideal.

Needless to say I am highly delighted with the results obtained both as regards range and volume and great simplicity, and shall be pleased to let anyone interested try it for themselves, if they care to make an appointment.—Yours truly,

F. M. SEARS.

627, Barking Road, E.13.

“Tone Wonderful”

Sir,—I have now got the “Soloodyne” working well and I am entirely satisfied with the results I am getting, in fact I consider it is better than the superhet I was using before, although that was very good. I only got it working last Saturday, October 2nd, and I have already logged at least 45 stations, all (most of them good strength) on the loud-speaker. Of course, some fading badly at times. A lot of other stations are heterodyned, and I am sure it is possible to get the 30 or even more.

The selectivity is very good, and on a good night I can cut out Cardiff (our local station) and get London very loud indeed by using a good deal of reaction and bringing the tone control nearly down to it.

Some of the **Photo-radiogram** receiving apparatus at Radio House, This instrument was employed in the reception of the photographs of the Dempsey-Tunney fight.

minimum. The volume is excellent and the tone is absolutely wonderful.

I enclose a list of stations I have received, and where I have put a query it means I have not absolutely identified the station, but have gone by the dial in Modern Wireless, and they are different from any other stations in the list.

If anyone likes to come and hear the set at the address below they are very welcome.—Yours truly,

W. MAURICE BROWN.

8, Trevorith Park, Weston-super-Mare.

[The list of stations has been omitted owing to the pressure upon our space.—Ed.]

**“Uncanny”**

Sir,—I am sending you my opinion of the “Soloodyne.” It was tested out within a mile of 6 LV, who was tuned out absolutely when any other station was being received. I cannot speak too highly of the “Soloodyne,” the perfect ease of control, and the way one station after another comes rolling in, is nothing short of uncanny. To sum the receiver up, it is the most wonderful I have ever heard, seen, or handled. Please make whatever you wish of this testimonial. To my mind, it is a receiver everyone should know about.—Yours truly,

Liverpool,

D. MELLOR.

**LECTURE AT CROYDON.**

On the evening of the 18th October, a short lecture and demonstration of the Elstree “Soloodyne” were given before the Croydon Wireless Society, under the chairmanship of Mr. Eladen, at 128a, George Street, Croydon. There was a good attendance and the members present showed great interest in the set. Some of the members had themselves built the “Soloodyne” and were glad of the opportunity of obtaining first-hand advice on the handling and adjustment of the set.
TRIUMPH FOR ELSTREE DESIGN

Thirteen-Year-Old Boy’s Success at New York Radio Exhibition

“MEWFLEX” WINS SPECIAL CUP

A specially interesting feature of the Great Annual Radio World’s Fair at New Madison Square Garden, New York, was the international competition for home constructed sets of all types. The principal class and the only one in which Radio Press readers entered was the multi-valve category (3 or more valves).

Entries were invited from all over the globe, and many sets were sent in by British amateurs, a truly international contest of set builders resulting. The awards were made on a basis of “workmanship, appearance, volume, distance, selectivity and tone,” a body of leading American experts, headed by Dr. Alfred Goldsmith, being the judges.

The result has proved to be a triumph for Elstree, and has once again shown the outstanding excellence of Radio Press Star designs. The second prize in the class for competitors under sixteen years of age was won with a “Mewflex” receiver entered by J. A. E. Black, of Mill Hill School, a thirteen-year-old British competitor. This set also won a special cup for general fine workmanship. Below the young prizewinner tells why he decided to make the “Mewflex.”

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 much too loud, 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 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.

J. A. E. BLACK.

On the right, Master J. A. E. Black, and, left, a “photo-radiogram” as it was received in New York. It was transmitted in response to a cable from the Exhibition authorities.
SIX COUNTRIES ON ONE VALVE!

Extract from "Radidea's" article in the "Manchester Evening Chronicle," September 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 3,500 ohms, an amplification factor of 6, with short-path construction and dual-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 lecture 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 BREZSLAU UNION RADIO, MADRID, and the lady giving the latest 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!"
GOLDEN HARMONY

CLEAR at a whisper—clear at the heavy volume of a brass band... the T.M.C. "Concert Grand" brings a wealth of mellowness, and faithfully reproduces the sounds originated in the broadcasting studio.

The instrument is unequalled for its freedom from "throaty" noises, because the copper used in the construction of the horn is in a natural, unstressed state and its frequency of vibration is out of range of any note which the loud speaker may be called upon to reproduce. It gives that full richness which only copper can give.

The magnetic system—a vitally important part of every loud speaker—is the result of much study and experimental work. Your dealer will supply you. **Price** - £5 : 10 : 0

OTHER T.M.C. RADIO SPECIALITIES.

LOUD SPEAKERS.

- Standard ... £4 5 0
- Junior ... £1 17 6
- Minor ... 17 0

CRYSTAL SETS.

From £2 6. to £2 7s. 6d.

The "Gramo-speaker" is a little brother to the "Concert Grand." In a moment it will turn your Gramophone into a splendid loud speaker, or it can be fitted to home made or purchased horns of ordinary design. It makes a most useful extra loud speaker at a nominal price, for your nursery or for entertaining your domestic staff. It is not an adapted "Earpiece" with the diaphragm held in place by a screw-on cap, ready to loosen through its own vibration. It is a real loud speaker unit with an adjustable magnetic system (loud speaker size) fitted with permanent magnets of cobalt steel and a diaphragm firmly clamped between ground metal surfaces. For performance, finish and price it is the best of its kind. Ask your dealer to show it to you. Its price is only £3 6.

OTHER T.M.C. RADIO SPECIALITIES.

HEADPHONES.

No. 2, Light. Weight: 1 lb. 12 oz. £7 15 0
No. 2a, Head/Ear M/d 12/ Flash fixed case, £5 15 0

LOW CAPACITY KEYS.

No. 1, 16 black, 1 rose, £1 15 0
No. 2a, 24 " 3 " 12/£1

TMC

Telephone Manufacturing Co. Ltd.
Hollingsworth Works, West Dulwich, S.E. 21.

Phone: Sylvania 2460-1. Telegrams: "Babysits, Dulwich, London."

Tell the Advertiser you saw it in "Modern Wireless."
## WEEKENDS.

<table>
<thead>
<tr>
<th>Time</th>
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<th>Call Sign and Wavelength</th>
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<td>Leipzig</td>
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<td>Konigs-wurtzler-</td>
<td>AFT 1300 m</td>
<td>Midnight</td>
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<td>7.0</td>
<td>Königsberg</td>
<td>447.5 m</td>
<td>9.30 or 11</td>
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<td>9.30 and 582.5 m</td>
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<td>7.0</td>
<td>Bratislava</td>
<td>900 m</td>
<td>9.0 p.m</td>
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<td>Bilbao</td>
<td>EA1J 415 m</td>
<td>9.30 p.m</td>
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<td>Radio-Cartagena</td>
<td>EA1J 235 m</td>
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<td>Frankfurt</td>
<td>475 m</td>
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<td>Geneva</td>
<td>760 m</td>
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<td>7.15</td>
<td>Brüssel</td>
<td>418 m</td>
<td>9 or 11 p.m</td>
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<td>Hamburg</td>
<td>392.5 m</td>
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<td>7.55</td>
<td>Eiffel Tower</td>
<td>FL 2650 m</td>
<td>5 mins Sp</td>
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<tr>
<td>8.0</td>
<td>Königswurtzler</td>
<td>483 m</td>
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<td>Radio-Bruxelles</td>
<td>SHR 487 m</td>
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<td>Budapest</td>
<td>560 m</td>
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<td>Radio-Paris</td>
<td>CFR 1750 m</td>
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<td>95 m</td>
<td>1 hour</td>
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<td>EA1J 460 m</td>
<td>Midnight</td>
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<td>Salamanca</td>
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<td>FL 2650 m</td>
<td>5 mins Sp</td>
</tr>
<tr>
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<td>Eiffel Tower</td>
<td>FL 2650 m</td>
<td>5 mins Sp</td>
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## SUNDAYS.

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<td>9.25</td>
<td>Hilversum</td>
<td>NSF 1050 m</td>
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<td>Königswurtzler</td>
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<td>12.30 p.m</td>
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<td>Unión-Radio</td>
<td>EA1J 378 m</td>
<td>12.30 p.m</td>
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<td>11.57</td>
<td>Nauen</td>
<td>POZ 3100 m</td>
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<td>1.45 p.m</td>
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<td>2.10</td>
<td>Hilversum</td>
<td>NSF 1050 m</td>
<td>4 p.m</td>
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**MODERN WIRELESS**

**Regular Programmes from Continental Broadcast Stations**

Edited by CAPTAIN L. F. PLUGGE, B.Sc., F.R.A.E., F.R.Met.S.
<table>
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<th>p.m.</th>
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<td>Union-Radio</td>
<td>EAJ 373 m.</td>
<td>3.30 p.m.</td>
<td>7.30</td>
<td>Voxhaus</td>
<td>b 504 m. and 371 m.</td>
<td>Midnight.</td>
</tr>
<tr>
<td>2.30</td>
<td>Zurich</td>
<td>513 m.</td>
<td>5 p.m.</td>
<td>7.40</td>
<td>Hilversum</td>
<td>NSP 10.60 m.</td>
<td>10.49 p.m.</td>
</tr>
<tr>
<td>4.0</td>
<td>Monaster</td>
<td>mA 410 m.</td>
<td>7.30 p.m.</td>
<td>8.0</td>
<td>Milan</td>
<td>IMI 320 m.</td>
<td>11 p.m.</td>
</tr>
<tr>
<td>4.30</td>
<td>Milan</td>
<td>IMI 320 m.</td>
<td>6 p.m.</td>
<td>8.0</td>
<td>Oslo</td>
<td>332 m.</td>
<td>11 p.m.</td>
</tr>
<tr>
<td>4.40</td>
<td>Bloemendaal</td>
<td>315 m.</td>
<td>2 hrs.</td>
<td>8.0</td>
<td>Radio-Carlsberg</td>
<td>EAJ 335 m.</td>
<td>10 p.m.</td>
</tr>
<tr>
<td>5.30</td>
<td>Lisbon</td>
<td>940 m.</td>
<td>7 p.m.</td>
<td>8.0</td>
<td>Hamburg</td>
<td>ha 382.5 m.</td>
<td>11 p.m.</td>
</tr>
<tr>
<td>6.0</td>
<td>Brunn</td>
<td>521 m.</td>
<td>9 p.m.</td>
<td>8.0</td>
<td>Budapest</td>
<td>260 m.</td>
<td>Midnight.</td>
</tr>
<tr>
<td>6.0</td>
<td>Leipzig</td>
<td>422 m.</td>
<td>Midnight.</td>
<td>8.0</td>
<td>Eiffel Tower</td>
<td>FL 2560 m.</td>
<td>Midnight.</td>
</tr>
<tr>
<td>6.0</td>
<td>Radio-Castella</td>
<td>EAJ 340 m.</td>
<td>8 p.m.</td>
<td>8.0</td>
<td>Königswusterhaus</td>
<td>AFT 1300 m.</td>
<td>Midnight.</td>
</tr>
<tr>
<td>6.0</td>
<td>Radio-Barcelona</td>
<td>EAJ 325 m.</td>
<td>8.30 p.m.</td>
<td>8.0</td>
<td>Munster</td>
<td>410 m.</td>
<td>10 p.m.</td>
</tr>
<tr>
<td>6.1</td>
<td>Goteborg</td>
<td>SASB 387 m.</td>
<td>9.15 p.m.</td>
<td>8.0</td>
<td>Rome</td>
<td>IRO 425 m.</td>
<td>10 p.m.</td>
</tr>
<tr>
<td>6.15</td>
<td>Stockholm</td>
<td>SASA 340 m.</td>
<td>9.15 p.m.</td>
<td>8.10</td>
<td>Radio-Agen</td>
<td>318 m.</td>
<td>15 mins.</td>
</tr>
<tr>
<td>6.15</td>
<td>Sundsvall</td>
<td>SASD 345 m.</td>
<td>9.15 p.m.</td>
<td>8.10</td>
<td>Königsberg</td>
<td>463 m.</td>
<td>15 mins.</td>
</tr>
<tr>
<td>6.15</td>
<td>Boden</td>
<td>BAS 1290 m.</td>
<td>9.15 p.m.</td>
<td>8.15</td>
<td>Copenhagen</td>
<td>247.3 m.</td>
<td>15 mins.</td>
</tr>
<tr>
<td>6.15</td>
<td>Malmo</td>
<td>SASC 270 m.</td>
<td>9.15 p.m.</td>
<td>8.15</td>
<td>Geneva</td>
<td>760 m.</td>
<td>1 hour.</td>
</tr>
<tr>
<td>6.30</td>
<td>Eiffel Tower</td>
<td>FL 2560 m.</td>
<td>7.55 p.m.</td>
<td>8.15</td>
<td>Radio-Bruxelles</td>
<td>SBR 487 m.</td>
<td>10 p.m.</td>
</tr>
<tr>
<td>7.0</td>
<td>Munich</td>
<td>485 m.</td>
<td>10.30 p.m.</td>
<td>8.25</td>
<td>Breslau</td>
<td>251 m.</td>
<td>Midnight.</td>
</tr>
<tr>
<td>7.0</td>
<td>Berne</td>
<td>435 m.</td>
<td>9.30 p.m.</td>
<td>8.30</td>
<td>Marseilles</td>
<td>PTT 331 m.</td>
<td>9.30 p.m.</td>
</tr>
<tr>
<td>7.0</td>
<td>Prague</td>
<td>358 m.</td>
<td>8.30 p.m.</td>
<td>8.30</td>
<td>Ecole Supérieure</td>
<td>FPTT 458 m.</td>
<td>11 p.m.</td>
</tr>
<tr>
<td>7.0</td>
<td>Radio-Wien</td>
<td>531 m. and 582.3 m.</td>
<td>9.30 p.m.</td>
<td>8.30</td>
<td>Radio-Toulouse</td>
<td>430 m.</td>
<td>11 p.m.</td>
</tr>
<tr>
<td>7.0</td>
<td>Lausanne</td>
<td>HB2 850 m.</td>
<td>8 p.m.</td>
<td>8.30</td>
<td>Frankfurt</td>
<td>479 m.</td>
<td>10.45 p.m.</td>
</tr>
<tr>
<td>7.0</td>
<td>Stuttgart</td>
<td>446 m.</td>
<td>10 p.m.</td>
<td>8.30</td>
<td>Radio-Paris</td>
<td>CFR 1750 m.</td>
<td>11.30 p.m.</td>
</tr>
<tr>
<td>7.0</td>
<td>Zurich</td>
<td>513 m.</td>
<td>9 p.m.</td>
<td>9.0</td>
<td>Radio-Viscaya</td>
<td>EAJ 418 m.</td>
<td>11.30 p.m.</td>
</tr>
<tr>
<td>7.0</td>
<td>Hamburg</td>
<td>ha 392.5 m.</td>
<td>8 p.m.</td>
<td>9.0</td>
<td>San Sebastián</td>
<td>EAJ 331 m.</td>
<td>11 p.m.</td>
</tr>
<tr>
<td>7.0</td>
<td>Breslau</td>
<td>251 m.</td>
<td>8 p.m.</td>
<td>9.0</td>
<td>Salamanca</td>
<td>EAJ 418 m.</td>
<td>11 p.m.</td>
</tr>
<tr>
<td>7.0</td>
<td>Helsinki</td>
<td>522 m.</td>
<td>9.30 p.m.</td>
<td>9.15</td>
<td>Petit Parisien</td>
<td>333 m.</td>
<td>10.30 p.m.</td>
</tr>
<tr>
<td>7.0</td>
<td>Warsaw</td>
<td>480 m.</td>
<td>10 p.m.</td>
<td>9.30</td>
<td>Radio-Cataluna</td>
<td>EAJ 342 m.</td>
<td>Midnight.</td>
</tr>
<tr>
<td>7.0</td>
<td>Radio-Cadiz</td>
<td>EAJ 357 m.</td>
<td>9 p.m.</td>
<td>10.0</td>
<td>Union-Radio</td>
<td>EAJ 373 m.</td>
<td>11.45 p.m.</td>
</tr>
<tr>
<td>7.0</td>
<td>Barcelona</td>
<td>325 m.</td>
<td>9 p.m.</td>
<td>10.14</td>
<td>Eiffel Tower</td>
<td>FL 2560 m.</td>
<td>Midnight.</td>
</tr>
<tr>
<td>7.30</td>
<td>Bilbao</td>
<td>EAJ 415 m.</td>
<td>9.30 p.m.</td>
<td>11.57</td>
<td>Nauen</td>
<td>POZ 3100 m.</td>
<td>8 mins. Sp.</td>
</tr>
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**A WONDERFUL PRODUCTION**

The December issue of MODERN WIRELESS will be

**A SPECIAL CHRISTMAS DOUBLE NUMBER.**

Mr. J. H. Reyner, B.Sc. (Hons.), A.M.I.E.E., will describe The "Isofom" Receiver, a remarkable new design.

Other items will be:

- A Simple H.T. Unit for the A.C. Mains, by the Elstree Laboratories.
- Luminis in H.F. Amplification, by J. H. Reyner, B.Sc. (Hons.), A.M.I.E.E.
- A Five-Valve Set employing a special L.F. circuit, designed for maximum purity of reproduction.
- A Striking Article describing a neutralising scheme of great interest to every wireless enthusiast, by C. P. Allinson, A.M.I.E.E.
- Further Hints on the "Elstree Six" and "Solodyne" Receivers.

OUT DECEMBER 1st.  Price 1/6
QUIET reigns as the moon rises slowly over the desert and throws into relief those great towering monuments erected thousands of years ago by the ancient Pharaohs. Many dynasties have fallen since first those pyramids were built by the genius and toil of a bygone age. But to-day they stand against the moonlight as they did centuries ago—symbols of eternity.

The spirit which animated those great architects finds to some extent a parallel in the genius and skill which have produced the S.T. Valve. It is not enough that it gives superb performance as its dynamic curves clearly show. The strength and tone given by S.T. valves are ensured month in and month out by the new Barguet process, which gives the highest vacuum hitherto obtained, and by the use of the torodiunum filament, which is made of a new alloy of precious metals emitting a copious stream of electrons without visible glow and yet which is as tough and resilient as a steel cable.

S.T. Valve

2, Melbourne Place,
LONDON,
W.C.2.

For Types and Prices, see page 595.

Built like the Pyramids—to last
DAY and NIGHT EFFECTS

By G.P. Kendall, B.Sc.

In this interesting article the author explains in a simple manner the wide variation between the daylight and night ranges of a given receiver. The big difference which does exist is not always fully appreciated by the wireless enthusiast.

"Well, that is very good, but what will it do in daylight?" The beginner is apt to find such remarks as this rather disconcerting when made by an experienced friend to whom he is relating stories of the powers of his latest receiver, such as bringing in Aberdeen on the loud-speaker with only three valves, and so on, for he does not always feel that they are quite justified.

A Misconception
At first, one finds that a set will bring in such and such results on a certain occasion, and one is apt to assume that that is the standard of reception of that particular receiver, and that one can claim such results to one's friends without mentioning anything about conditions. As a matter of fact, the pertinent question above relates to an aspect of reception which has a most powerful influence upon the behaviour of any given set, and since it is one to which many people do not attach sufficient importance, it is intended in these notes to give some idea of the allowances which should be made for varying conditions of darkness and daylight and so on.

A Wide Variation
Now, it must be realised at the very outset that there is a most enormous difference between the having some good form of reaction circuit for the detector and perhaps one or two stages of low-frequency amplification, it is no uncommon thing to find that quite a large number of main stations can be received after dark, with a good sprinkling of Continentals, some even coming up to loud-speaker strength. During the day time, however, it is a most unusually good receiver of this type which will bring in anything except perhaps one or two of the nearest stations.

An Example
This effect was, perhaps, better appreciated in the days when crystal receivers were our main standby, and as an example I would quote the figure of 200 miles which used to be given as a standard range of a 3½ kilowatt ship's spark transmitter, when used with a standard receiver. This was regarded as the definite guaranteed range of the installation, but plenty of sea-going operators will remember occasions on which they covered distances of the order of 1,000 miles with this equipment, but practically always during the night. By day, signals from the more distant stations faded away com-
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.

He was successful in that same year in producing the first condenser to meet these requirements. Its dielectric was Mica.

Three years later, encouraged by the War Office, he commenced upon the manufacture of condensers on a large scale, and the Dubilier Condenser Company at once assumed the leadership which it holds to this day.

For sixteen years we have specialized in the manufacture of wireless condensers, and for all products bearing our name we have continuously insisted upon that high standard of efficiency which we as Radio Engineers know to be so essential.

Naturally this high standard implies a slightly increased selling price, but it undoubtedly results in the production of condensers in which you can have complete confidence.

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

Specify—

DUBLIERS

Tell the Advertiser you saw it in "Modern Wireless."
DAY AND NIGHT EFFECTS—(Concluded)

plently, and the range came down to something in the neighbourhood of the standard figure of 200 miles.

Using a simple crystal receiver for the reception of ship stations the effect is most marked, and would probably surprise many of those who regard a crystal set as merely something for receiving a broadcasting station at distances of the order of, perhaps, 20 miles.

Try It

This is quite an interesting thing to try for those who have crystal receivers which will tune to the standard ship wave of 600 metres, and they will find that during the day they only hear ships' signals at intervals, perhaps, from only two or three stations during quite a considerable period. This, of course, depends to some extent upon where the set is used, but in general you will find that as darkness falls, signals begin to increase in volume and in number in quite a surprising fashion, until finally, when night has fallen, there is quite a lively amount of traffic going on, and the headphones are rarely silent for long.

With a Single-Valve Set

With such a set as a single-valve reaction receiver, one can demonstrate these effects almost as strikingly, using the various broadcasting stations as the sources of test signals. For example, in my locality if I listened in with an average single-valve reaction receiver, with finely controlled reaction operated at a safe distance below the oscillation point, it would be found that the only stations which can be heard with any degree of reliability (other than the local one) during daylight, are Birmingham and Bournemouth, limiting one's search, of course, to the short wave band.

As darkness falls, the German stations begin to come in, as a rule somewhat ahead of the other stations in daylight with any degree of certainty, we must realise that we need something more than a simple type of set, but, on the contrary, we require something with really efficient high-frequency amplification, like one of the more modern types of sets, or a superheterodyne.

An Interesting Field

Although the beginner is often a little incredulous as to differences in reception during day and night until he has gained a little experience, as a matter of fact these differences are so great and so erratic that they form a very interesting subject for observation.

Probably the most striking example of such a field of observation open to the average listener is to be found in the reception of the American broadcasting stations, which, as is now well known, can often be picked up with quite simple sets during the winter months, at favourable hours. It will be noted that I have qualified the statement just made in two ways; first, "during the winter months" and secondly, "at favourable hours."

Although, of course, I should not like to say that American stations are never heard during the summer, it is very unusual for them to come in during the period of long days and short nights, and it is chiefly in the winter that they can be picked up.

Conditions

Then, as to favourable hours, I do not recollect ever having heard of an American station on the normal broadcast band between 200 and 600 metres ever having been heard during the hours of daylight, and the study of the conditions and times under which various American stations are heard in this country forms a really quite interesting subject for observation, by anyone possessing the necessary moderately sensitive receiver and time for listening.

An Interesting Study

It is quite an interesting study to note the exact readings upon the dials for a few of the more commonly received American stations, and to listen for them carefully one evening as darkness is spreading across the Atlantic, and note when the carrier waves begin to be perceptible, observing how they grow in strength as darkness falls all the way across the ocean, till finally some of them become of quite passable strength, with, of course, the usual spells of fading.
At last an Accumulator which can be charged quickly but discharged slowly

AFTER successfully solving the problem of the H.T. Accumulator, Oldham now presents in the new O.V.D. a slow discharge Accumulator incorporating entirely new principles of construction. With the growing popularity of Dull Emitter Valves there has been an incessant demand for a small accumulator suitable for use with two- and three-valve sets, capable of holding its charge over long periods without sulphation. Read below and see how, in the new O.V.D., Oldham has now overcome every previous obstacle.

ON the introduction of the Dull Emitter Valve, a new problem began to loom on the horizon for the accumulator manufacturer. With the valve-maker producing valves of almost negligible consumption it became increasingly obvious that old ideas had to be swept overboard. The old idea was that an accumulator should last the average valve set anything from a week to a fortnight and should then be recharged. That was alright with bright emitters consuming, say, 75 amp. each, but when consumption was dropped to one tenth of an ampere at 2 volts, a new kind of accumulator became necessary. An accumulator which would hold its charge for weeks on end without the necessity of recharging.

Oldham solves the problem of re-charging

Here, then, was the problem — how should it be solved? One way would be to increase the thickness of the plates. But this introduces another difficulty — the difficulty of recharging. Obviously a thick plate will hold its charge for many weeks. It won’t buckle and it is reasonably free from the risk of sulphation. But it cannot be easily recharged. It must be charged slowly, and for a long period on end. Compare the thick plate if you like to a thick mass of absorbent material dipped in liquid. It will take a long time for moisture to penetrate to its innermost recesses, but cut it in strips and the liquid can take effect at once. That was exactly what Oldham did. The new Oldham O.V.D. plate is the equivalent of a thick plate made up of laminations. Electrolyte can penetrate completely through the plate and get to work upon its several surfaces. The new O.V.D., therefore, incorporates every advantage of a thick plate with none of its disadvantages. It can be charged quickly — that is to say, at the normal accumulator charging rate. There is no fear that it can be damaged during charging. And it will readily take up its charge.

A plate that cannot buckle or sulphate

The new O.V.D. plate, owing to its exceptionally rigid girdler-like construction, cannot buckle. Nor can it sulphate even if left for months without being recharged. Owing to the internal construction of the stout glass cell no separators are necessary.

The new O.V.D. supplied charged ready for use

This new Accumulator is supplied “dry charged”. This means that it has already been charged at the factory. Merely add acid and wait for a short while for the cell to get active and it can be used at once. Thank heaven for you. No long first charge to delay you. The O.V.D. can come straight off the dealer’s shelf to your home and within an hour can be delivering its stored-up energy.

Every O.V.D. made under the Special Activation Process

The famous Special Activation Process which has made the name Oldham a household word for reliable accumulators is used in the O.V.D. Its Laminode Plates are manufactured under the same conditions as other Oldham plates. As a result the same high standard of efficiency is available. At the low price of 5s 6d the new O.V.D. offers remarkable value. Its stout clear-glass container — rugged enough to withstand the hardest knocks — its collapse terminals of generous size — and its non-splash vent cap bespeak the quality product. Ask your Dealer about it to-day.

Oldham & Son, Ltd.,
Denton, Manchester

Special Activation Process Batteries

Type O.V.D.

2 volts — for use with Dull Emitter Valves. Fitted with the new Laminode Plate. Dimensions 6 ins. by 3 ins. by 2½ ins. 10 amp. hours.

5s 6d

Tell the Advertiser you saw it in “MODERN WIRELESS.”
THE LOEWE VALVE
An Interesting Demonstration at Elstree

At the Radio Press Laboratories on the evening of September 20, an interesting demonstration of a remarkable new German valve was given by the inventor, Dr. Loewe, in the presence of Mr. John Scott-Taggart and members of the staff. The main feature of this valve is that the one evacuated bulb may contain the necessary components for a complete amplifier of two stages. In the case of the two valves demonstrated, for instance, one was arranged internally to give the equivalent of the ordinary detector and two resistance coupled note magnifier circuit, while the other consisted of two high-frequency valves in one, coupled on the well-known T.A.T. principle.

Compact Sets

It naturally follows that when valves of this type are incorporated in a receiver there will be practically no additional components to include, and it becomes possible to build extremely compact sets.

Receivers Demonstrated

Two receivers employing these valves were shown by Dr. Loewe, the smallest of which employed one valve to give a detector and two low-frequency stages. A photograph of this set is given, from which an impression of the remarkable compactness may be gathered. A simple form of reaction circuit is used, and very powerful results are obtained from the local station, with excellent quality of reproduction.

The Circuit

The receiver upon which the main demonstration was performed is equivalent to a five-valve receiver, two of the special valves being used in this case. The first of these is a two-stage high-frequency amplifier on the T.A.T. principle while the other is similar to the valve just described. The circuit is given on page 619, and is quite straightforward, except for the positively biased extra grids of the H.F. amplifier. Two tuned circuits are incorporated, these being separated by an "aperiodic" coupling in the form of a resistance. This latter is found to give good results even on the lower broadcast waves, and the explanation may be found in the very short wiring existing in the valve.

Below: Dr. Loewe is seen explaining the arrangement of his larger set to Mr. G. P. Kendall (standing.)


Long Wave Efficiency

When working on the longer waves, however, such as that used by Daventry, a distinct increase in efficiency was noticeable, as is generally the case with resistance-coupled H.F. amplifiers. The receiver gave very interesting results, ten foreign stations as well as several B.B.C. (Concluded on page 619.)
do you remember — the first radio unit you made?

how you bought a sheet of ebonite and hacked it to size (or thereabouts) with a hack saw?

how the drill burrowed its protesting way through the gritty material, and smothered you and the kitchen with dust?

think of your early radio experiences when you see one of

REDFERN’S
EBONART
NON-METALLIC SURFACE
RADIO PANELS

at your dealer’s, examine its smooth edges accurately ground dead to size.

see how its perfect polish (non-metallic) has been kept free from blemish by the damage-proof carton in which it comes.

take a shred off its edge with a penknife (if your dealer doesn’t object) to judge its wonderful drilling and tapping qualities.

and then say “Thanks. I’ll take this — it’s one of

REDFERN’S
EBONART
NON-METALLIC SURFACE
RADIO PANELS

Stocked by all reputable radio dealers in the 21 standard sizes in black and mahogany (polished surface) and in fine S.B. matt (black).

Discriminating buyers of complete radio units always look for the Ebonart tag.

Tell the Advertiser you saw it in "MODERN WIRELESS."
WHAT JACK SHALL I NEED?

By A. V. D. HORT, B.A.

All constructors of wireless receivers should have some knowledge of the construction and operation of that useful switching device—the plug and jack. The following article will tell you all about the more commonly used types.

The use of jacks as a means of carrying out one or more switching operations is finding an increasing popularity with set designers, jacks have, among others, these points to recommend them to the constructor: they give a neat appearance to the panel, they form a convenient means of switching, and they cannot be tampered with without the plug employed with them.

Jacks are used not only in wireless apparatus: they find a very extensive application in telephone switchboards, either with plugs and cords for making the connections, or in the form of "key" switches, which are really only key-operated jacks.

The constructor who is making up a wireless receiver, and who wishes to use jacks, may well be puzzled by the different types available. Each jack has its own special function, the insertion or withdrawal of the plug-switching circuits in or out, as required. Thus, there are "Single Circuit Closed," "Single Open Circuit," and "Single Open Circuit Filament Control" jacks, to quote examples. Perhaps these terms convey little to the reader if he is not well acquainted with jacks, and some explanation of them may be helpful.

A Simple Form

Before passing on to discuss individual types of jacks, it may assist the reader to grasp the principles of the jack if Fig. 1 is considered. Here we have a "Single Open Circuit" jack, the simplest form which is used.

L.F. Switching

Now jacks are not to be recommended for use in the high-frequency stages of a receiver, since the method of their construction almost inevitably introduces considerable unwanted capacities in the circuit. In practice, jacks are almost invariably employed in the low-frequency circuits, usually for placing the telephones or loud-speaker in circuit.

Explanatory Details

The jack shown in Fig. 1 has two essential parts—the "body" A and the springy contact blade (1). C is an insulating block separating A from (1). When a plug, shown in section in Fig. 1, is inserted through the hole in the body of the jack, the sleeve of the plug makes contact with the body, while the tip of the plug, which is insulated from the sleeve, connects with the contact blade. The "V" shaped end of the blade drops into the nick behind the tip of the plug, making a firm contact and locking the plug in position.

Fig. 1—The construction of plugs and jacks is simple to understand.

Fig. 2—The plug and jack of Fig. 1 are commonly employed as shown above.

Fig. 3—The Single Circuit Closed jack possesses an additional contact (2), and may be used as seen in the theoretical diagram.
STARTLING THE TRADE WITH A NEW LISSEN TRANSFORMER.

TURN'S RATIO
3 to 1
RESISTANCE RATIO
4 to 1
Price
8'6
and guaranteed for 12 months.

Powerful amplifiers now within the reach of all!

TRADE buyers who came to us during the first few days of the Olympia Exhibition scarcely believed it when we told them the price of this new LISSEN part. After taking away samples, however, many of them came back to order and to urge for quick delivery—those who did not come back ordered direct to factory—ORDERED AFTER PROVING PERFORMANCE.

Private users who have also tested have told us they have found the results equal to expensive transformers they were previously using.

We knew all this would be the case, because THIS NEW LISSEN TRANSFORMER WAS MADE PURPOSELY TO EQUAL THE PERFORMANCE OF EXPENSIVE TRANSFORMERS AND SO GOOD IS IT THAT WE HAVE UNHESITATINGLY WITHDRAWN IN ITS FAVOUR ALL OUR HIGH PRICED MODELS, which have been on the market and largely sold for nearly four years past. Pure, powerful, economical, amplification is now at last within the reach of all.

By ourselves distributing direct to the retail trade we have cut out all wholesale profits. This new policy coupled with our ambitious production programme, has been a big factor in enabling us to sell the new LISSEN TRANSFORMER at its remarkably low price. Nobody should now pay highly to get a high grade transformer. Compare this new LISSEN against any for tone, purity and power. IT AMPLIFIES EVERY NOTE—EVERY HARMONIC—EVERY OVERTONE.

You can get it at your dealers, or direct from factory if any difficulty. If you are not satisfied with it after seven days' test, take it back to your dealers or send it back to us. You will find it suits every set and every valve you will want to use.

Include no postage if you send direct, but please send dealer's name and address.

LISSEN LIMITED, Lissenum Works, 20-24, Friars Lane Richmond, Surrey. Managing Director T. N. COLE.

Use it for 1, 2 or 3 stages L.F.
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.
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.

For types and prices see page 595.

John Scott Taggart

AND TONE

Tell the Advertiser you saw it in "Modern Wireless."
WHAT JACK SHALL I NEED?— (Continued)

A "Single Open Circuit" jack is normally used to place the telephones or loud-speaker in circuit, as shown in Fig. 2. The telephones are connected to the terminals of the plug, H.T. positive and the anode of the valve being connected to the contact blade and body of the jack respectively.

Simultaneous Control
This simplest form of jack may be taken as a guide to other types, illustrating a rule which applies to them all. The telephones, or similar apparatus to be connected in the anode circuit, are connected to the plug. The body and "V" shaped contact in the jack, or in "Double Circuit" jacks the two "V" shaped contacts, are connected in the anode circuit. Any other contacts there may be are used for filament control or other switching, these operations being controlled simultaneously with the insertion of the plug—i.e., putting the telephones in circuit.

Having now dealt with the "Single Open Circuit" jack, we may proceed to develop this by adding other contact blades. The same type of plug is, of course, used throughout.

Closed Types
If one contact is added to the jack, we have the "Single Circuit Closed" type, shown in Fig. 3, in which a suitable circuit for employing the extra contact is also given. In the normal state, the blade (2) is in contact with blade (1). When the plug is inserted, it makes contact with (A) and (1) in the usual way, and at the same time lifts (1) away from (2). In the circuit shown the loud-speaker is permanently wired in circuit. The insertion of a plug connected to the telephones puts them in circuit, disconnecting the loud-speaker. It will be noted that one side of the loud-speaker is still connected to the "live" circuit.

The Double Circuit Jack
When it is desired, by inserting the plug, to cut out altogether the apparatus normally connected in circuit, a "Double Circuit Closed" jack may be used, as shown with a suitable circuit in Fig. 4. In this

Fig. 4.—The Double Circuit Closed jack is frequently used for cutting out a note magnifying valve.

Fig. 5.—The jack depicted above is simply an elaboration of that shown in Fig. 1—two further contacts being added for filament control.

Fig. 6.—This type of jack switches out the filament of the last valve and places the telephones or loud-speaker in the anode circuit of the first L.F. valve.

jack no electrical use made of the body (A). Two contact blades (1) and (3) are used, (3) taking the place of the body and making contact with the sleeve of the plug.

The blades (2) and (4) are here normally in contact with blades (1) and (3), the insertion of the plug pushing the latter pair apart and breaking both contacts.

Filament Control
So far the jacks discussed have been those dealing with anode circuit connections only. If the filament of the valve could be switched on by the act of connecting the telephones in circuit, the utility of the system would be greatly enhanced. This is made possible by the addition of further contacts, as shown in Fig. 5, illustrating the "Single Open Circuit Filament Control" jack. Here the blade (1) and the body
EDISON BELL RADIO
A RAD’O MASTERPIECE.

This super 4 valve set, which appeals to novice and expert alike, was the most outstanding exhibit at the National Wireless exhibition. Its special feature is in addition to the wonderful selectivity, charming appearance and compactness of this set, its compactness. H.T. and L.F. batteries are enclosed in the set, compartments for name being provided at either end of the cabinet, as will be seen in the above illustration. Naturally, as does the very latest improvements, this set will appeal to all.

PRICE £15.0.0
Valves, Bases, N.T. Licence (extra)
EDISON BELL LIMITED, LONDON, S.E.15
and at Huntingdon.

INSIST ON EDISON BELL CONDENSERS
THEY ARE BRITISH MADE AND GUARANTEED BY A NAME WITH 30 YEARS REPUTATION BEHIND IT

MAGNUM SCREENED COILS

NEW STANDARD COILS AND PRICES,
MAGNUM Screening Box, complete with 6 Pin base
Standard (spiral and cross formation) ... £1.10.0

Split Primaries.

<table>
<thead>
<tr>
<th>Type</th>
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<td>H.F. Transformer</td>
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<td>H.F. Transformer</td>
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Set of Screens and H.F. Transformers, Filter and Oscillator for the 4 Valve Set...

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<td>Superhet described in Oct. issue</td>
<td>£3.10</td>
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NOTE—Where any complete set of Components, together with a drilled panel, is purchased, Royalties at the rate of 1½ d. per valve holder are payable.

The following Sets ready wired and tested:

<table>
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<th>Type</th>
<th>Price</th>
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<tr>
<td>Elstree Six</td>
<td>£3.00</td>
</tr>
<tr>
<td>Elstree Solodyne</td>
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Plus assorted Royalties at 1½ d. per valve holder.

FILAMENT TRANSFORMER AS USED IN THE CHARGING UNIT DESCRIBED IN OCT. ISSUE, OPERATING FROM 100-250 VOLS. A.C. TO 3, 5 OR 9 VOLS. £2.50

Tell the Advertiser you saw it in “MODERN WIRELESS.”

MAGNUM VOLUME CONTROL AS USED IN THE PRIZEWINNING MEWFLUX.

No. 1621.
A new Magnum product, designed to control the volume from loudspeaker without sacrifice of quality. Wire-wound, Non-inductive. One hole fitting.

Price 15/-
Size, 4 in. long by 2½ in. dia.

MAGNUM GANG CONDENSER
Recommended for the Elstree Solodyne £3.10

MAGNUM DUAL CONDENSER
Recommended for the Elstree Six... £1.10

BURNE-JONES & CO., LTD.,
Manufacturing Radio Engineers,
MAGNUM HOUSE,
256, Borough High St., London, S.E.1
Telephone: Hop 6257.
Telegrams: “Burrellin, Sedit, London.”
Cables: “Burrellin, London.”

THE ELSTREE SIX.
THE ELSTREE SOLODYNE.
THE MEWFLUX TRIPLE.
THE NIGHT HAWK.
THE DIFAPLEX TWO, Etc., etc.
Lists on receipt of stamps.

Tell the Advertiser you saw it in “MODERN WIRELESS.”
WHAT JACK SHALL I NEED?—(Concluded)

A photograph of the simplest jack used—the Single Open Circuit type.

perform the same functions as in the "Single Open Circuit" jack of Fig. 1. Two additional blades (5) and (6) are added above blade (1), these two being normally separated by a small gap. P is a pin of insulating material attached to blade (5) and resting on blade (7). Insulation is necessary here, since blade (1) is in the anode circuit and (5) in the filament circuit. The insertion of the plug pushes (5) into contact with (6), thereby completing the filament circuit.

A further development results in the "Single Closed Circuit Filament Control" (Fig. 6), which is the "Single Circuit Closed" jack (Fig. 3) with filament control added. In this case, the filament circuit also is normally "closed," blades (5) and (6) being in contact, to be separated by the insertion of the plug.

Obviously, the last two jacks described may be obtained with the filament control either "open" or "closed," so that the insertion of the plug switches a valve on or off as required.

Other Uses

Further, by combining the two arrangements, we can have double filament control (Fig. 7), the plug switching on one valve and switching off another. The types described above, however, are those which are most commonly met with, more elaborate jacks being developments on the same general principles.

It should be noted that it is not essential to use the plug for the anode circuit of the set. It may be preferred to plug in, for example, the low-tension battery, completing the anode circuit with the subsidiary contact blades. The method of use which has been described is, however, the conventional one, and the one which is generally accepted as the most convenient.

Fig. 7.—Double Filament Control is featured in some of the larger specimens.

A point worth noting is that jacks should always be connected so that the H.T. contact goes to the same side of the telephones when the plug is inserted. It is common practice to arrange for the tip of the plug to be connected to H.T. positive, but this is not essential.
As used in the "Night Hawk"
by Mr. Percy W. Harris
and in other well-known Receiving Sets

Eleven exclusive Eureka features

1. Absolute rigidity of fixed plates ensured by unit construction.
2. Moving plates held together to permit fine spacing with absolute security.
3. Special method of construction eliminates the possibility of fixed and moving plates short circuiting.
4. Ball bearings ensure smooth silky action under all conditions.
5. Dual connections (cone and pigtails) guarantee continuously silent performance.
6. Electrical losses so low as to be quite negligible. An invaluable feature for short wave use.
7. Generous and readily accessible soldering tags.
8. Equipped for panel mounting as one-hole or four-hole, whichever preferred.
9. Positive stops at both ends of scale.
10. Compact design permits a panel depth when closed of less than two inches. The .0005 mfd. Ortho-cyclic takes up much less room than most .0005 mfd. condensers.
11. Highly polished and beautifully finished throughout—a perfect example of British craftsmanship.

Now!
Space out your Stations as evenly as the rungs of a ladder

At last there is available a British Condenser which takes out all the guesswork of station finding and ensures a standard of selectivity which is almost incredible. The new Eureka Ortho-cyclic is a fine precision-made instrument designed to give mathematically equal spacings between all wavelengths throughout the whole of the scale. Within the first 15 degrees of the dial you will find 15 wavelengths of 10 kilocycles separation. Fifteen only—one to each degree! And the same precise separation will be found all through the scale. Yet in the ordinary condenser used under the same conditions you would find 51 wavelengths crowded into the same 15 degrees. An absurd overcrowding just where you need the greatest separation to ensure workable selectivity. No wonder wave-traps and similar gadgets are necessary to separate the wanted from the unwanted stations. Add to this astounding performance a host of other electrical and mechanical features and you'll understand why the Eureka Ortho-cyclic is unrivalled for performance, uniformity and enduring dependability. Before choosing your variable condenser ask to see the Eureka. To every discriminating wireless man its beautiful workmanship will be irresistible.

Portable Utilities Co., Ltd. (Eureka Radio Products), 8 Fisher St., London, W.C.1

Prices:
.0003 mfd. 14/6
.0005 mfd. 15/6

Tell the Advertiser you saw it in "Modern Wireless."
NEATNESS AND EFFICIENCY

A crystal set with aerial and detector taps

By H. BRAMFORD

This little set employs a tapped home-wound inductance which permits the use of "auto-coupling" and a variable crystal tap, both resulting in increased selectivity without loss of signal strength.

DESIRABLE feature at the present time is selectivity, not only in valve receivers but also in crystal receivers. At the same time, a crystal receiver should fundamentally be one of simple design and construction. Simplicity helps to make for efficiency as regards signal strength, and selectivity is desirable in order to be able to comply with the present conditions. The receiver about to be described in this article embodies these two features, as much as it is simple to construct, simple to operate, and gives efficient results. Further, it is not an expensive set to make, while at the same time, it presents a neat and pleasing appearance when completed. A list of the components required to build this set is given on another page.

Details of Construction

To carry out the construction of the receiver, first proceed to drill the panel in accordance with the details and dimensions given in the front of panel diagram. Having done this, proceed to secure the panel to the wood baseboard and side brackets by means of the four countersunk wood screws, as indicated. Next mount upon the panel the six terminals, and the crystal detector, leaving the assembly of the variable condenser to a later stage to facilitate the ease of the process of wiring up. Before proceeding any further, it is advisable to construct the tapped coil.

The Tapped Coil

First cut off a length of cylindrical former having an external diameter of 2 in. The former should be approximately 3\(\frac{1}{2}\) in. long. Commence from the right-hand side of the former, the winding being made with the wire specified in the list of materials. First secure the beginning of the winding by

---

Fig. 1.—Complete details of the circuit employed are given in this theoretical diagram.

Fig. 2.—The three 'phone terminals permit two pairs of telephones to be used in series.
Something new and good in component design

The latest LOTUS triumph is a Combination Grid Leak and Valve Holder which eliminates unnecessary wiring and soldering and makes for economy in cost and space.

Guaranteed efficient in construction and design.

From all Radio Dealers
Combination Grid Leak and Terminal Valve Holder .......... 3/9
Terminal Valve Holder .......... 2/6
Valve Holder without Terminals .......... 2/3

All Anti-Microphonie Type.

LOTUS Combination

GRID LEAK BUOYANCY VALVE HOLDER Anti-Microphonie

Garnett, Whiteley & Co. Ltd.
Lotus Works, Broadgreen Road, Liverpool.

The Grid Leak is not discernible, being totally enclosed in Bakelite Valve Holder Base.

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 1½ shaft, sold complete with 4½" Dial and is more compact than most S.L.F. Condensers.

Retail Prices:

.0005 mfd. .......... 11/6
.0005 mfd. .......... 10/6
.0025 mfd. .......... 10/6

Two of our new .0005 mfd. Straight Line Frequency Condensers, and one .00025 of the same type have been specified for the 5-valve Receiver described in this issue of Modern Wireless,—another proof of the remarkable efficiency and perfect workmanship of our instruments. Our extensive range includes types suitable for all the big sets recently published, and we guarantee that J.B. Condensers—the skilled product of experienced specialists—are unsurpassed by any on the market to-day, either for quality, efficiency, or price.

Particulars of the new J.B. Gang Control Dual Condenser on application.

THE LOWEST LOSSES YET!

That’s the claim we make for the new J.B. Condenser. The losses are, in fact, absolutely negligible. For instance, with the .0005 model the total losses measured at a million cycles are .02 ohms.

This is a fact established by an N.P.L. Test, and gives an added point of superiority to the J.B. which, while combining features of mechanical excellence, is logically an instrument for the radio man seeking a precision condenser.

PRICES:

.001 mfd. .......... 11/6
.0005 mfd. .......... 10/6
.0005 mfd. .......... 10/6
.003 mfd. .......... 13/6
.00025 mfd. .......... 13/6
.0002 mfd. .......... 13/6
.0001 mfd. .......... 12/6

.0005 mfd. Twin Low Loss Condenser, complete with 3½ Bakelite 1½, for the Elstree Six, Distales, MedaFlex and Elstreflex, 2½ each.

Tell the Advertiser you saw it in “MODERN WIRELESS.”

591
A SELECTIVE CRYSTAL SET

(Continued)

passing through two small holes previously made in the former, as shown in the back of panel diagram. At the first turn make a tapping; the method of doing this will be described later. Make a further tapping at the 5th, 10th, 15th, 20th, 25th and 30th turn. At this point secure the wire by means of two further holes made in the former, and finish by taking end through the inside of the former and cutting off. If the winding is close wound it will occupy a distance of approximately 7/16th of an inch. Commence a second winding in a similar manner, 7/16 in. away from the previous winding. This winding should be in a similar direction, that is to say, clockwise. Secure the beginning of the winding as before, making a tap at the first turn, and further taps at the 5th, 10th, 15th, 20th, 25th and 30th turn. At the 30th turn, finish off the winding by securing as before and passing the end of the wire through to the inside of the former and cutting off. Thus we have at present two separate windings upon the ebonite former.

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Fig. 3.—This practical wiring diagram will be found simple to follow. Note how the cylindrical coil is mounted, the threaded rod shown dotted, passing along the axis of the coil.

Making the Tappings

Care should be taken in making the tappings, as the wire is of a somewhat fine gauge, and due consideration should be given to this fact. The simplest way of making such tappings, which incidentally occasions the least possible amount of trouble, is as follows: At each tapping point make a small loop with the wire, and twist it closely with the fingers. Pliers should in no case be used, as this might easily result in over twisting and breaking the wire. Each tapping is twisted thus and made as the winding is proceeded with, and they should be spaced somewhat apart from each other, as shown in the drawing. When the winding is completed, the problem presents itself of removing in the best possible way the silk covering from the wire of the twisted tappings. This is quickly and easily done by placing a lighted match under each tapping until the silk covering is burnt away. The tappings should then be lightly scraped with a sharp knife in order to clean them, after which they may be bent over in order to strengthen them and make them more rigid.

Assembly

The coil thus made may now be assembled upon the wood side support, as shown in the back of panel.

COMPONENTS REQUIRED

One panel measuring 8 by 6 by 3/16 in. (any good make).
One cabinet with baseboard 6½ in. deep, and wooden side pieces (Pickett's).
One S.L.F. variable condenser 0005 (K. Raymond).
One fixed condenser, 0002 (Elloca).
One automatic loading coil socket for baseboard mounting (Athel or any other good make).
One permanent crystal detector (Radio Instruments).
A piece of ebonite former 2 in. external diameter by 3½ in. long.
Small quantity of No. 28 D.S.C. copper wire (40 ft.) (London Electric Wire Co.).
Glaze for wiring.
Two short lengths of insulated flex.
Two spring clips. (Peto Scott).
Six terminals. Peling and Lee).
Decko dial indicator (A.A. Bulgin).
Four ⅜ in. counter-sunk wood screws.
Better be safe than sorry!

Q: See that your Battery Eliminator employs T.C.C. Condensers

M.O.S.T Battery Eliminators contain Condensers which have to stand up to the full voltage of the mains. The mains voltage is often as high as 250 Volts A.C., and ordinary condensers tested to 300 volts cannot be guaranteed to stand up to this pressure for a long period.

Therefore, for safety's sake, use—or see that your Battery Eliminator utilizes—the special T.C.C. High-voltage Condensers. Built and tested to withstand 600 volts, the T.C.C. have been used on domestic lighting supplies for a number of years, is perfectly safe and absolutely reliable. For behind it are twenty-brimming years of experience in the making—years during which millions of Condensers, from large 4-c.e. Power models (consistently tested by P.O. Admiralty, War Office and Cable Companies), to the famous little green 1-ounce Wireless Condensers have been used. In the name of safety, could there be a better choice for a Battery Eliminator than T.C.C.?

T.C.C. Condensers
(Tested & Guaranteed)
for Battery Eliminators

T.C.C. 600 volt D.C. Test Mancheste Condensers are in capacities of 3, 1, 2, 4, 5, 8 and 10 mfd.

T.C.C. Condensers

(27 & 26a, LISLE STREET, LEICESTER SQUARE, W.C.2)
Back of Dai-"s Theatre, Nearest Tube, Leicester Square. Phone: Ger. a. 6827)

Tell the Advertiser you saw it in "MODERN WIRELESS."
A SELECTIVE CRYSTAL SET—(Concluded)

WIRING INSTRUCTIONS

Join terminal A to one side of C1.
Join other side of C1 to A1, and connect flex wire with spring clip on end to A1.
Join flex wire with spring clip on end to one side of detector.
Join other side of detector to 'phone terminal 1.

Join 'phone terminal 3 to E; E to moving plates of C2; moving plates of C2 to end of L2.
Join fixed plates of C2 to beginning of L1.
Join end of L1 to socket of holder for L3.
Join beginning of L2 to pin of holder for L3.

diagram. This is simply done by securing by means of a brass rod, two nuts, and a piece of ebonite strip. It should be remembered to the baseboard itself. Before assembling the variable condenser, proceed with the necessary wiring, which is tabulated. When we come to the point where it is necessary to make the connection to the variable condenser, this component may be mounted upon the panel.

The Circuit

From the theoretical circuit shown, it will be seen that constant aerial tuning may be employed by connecting the aerial to terminal A, and ordinary tuning by connecting the aerial to A1. The value of the C.A.T. condenser chosen is .002 microfarads. The aerial tap is used principally between tappings 30 to 60, which represent L3, L2 represents the loading coil. The earth in every case is connected to terminal E. Three telephone terminals are provided, thus enabling one or two pairs of 'phones to be used.

Operation

The operation is simple and easy. For reception from the local station no loading coil is necessary. The loading-coil holder chosen is designed in such a way that when the loading coil is pulled out it automatically short-circuits the holder. No shorting plug is therefore necessary when employing this particular holder. To tune in the local station, connect the aerial to terminal A or A1, as may be desired, place the aerial tap somewhere between 30 and 60 of L2, and the crystal tap between 0 and 30 of L1. The best positions should be obtained by experiment. The crystal tap should not be taken below the 30th turn, as this would result in an appreciable difference in signal strength. On the other hand, the aerial tap may be taken, if desired, to almost any tapping, but the best results will probably be obtained when used as specified. With the crystal detector adjusted, it is only necessary to tune in the local station by means of the variable condenser, C2. When X0 is to be received it will be necessary to plug in a loading coil in the region of 200 or 250.

Test Report

The set was tried out some ten miles north-east of 2LO on a moderate out-door aerial. Both the local and high-power stations were received with ease at excellent signal strength, also Morse and one or two amateurs below 360 metres. Using two pairs of 'phones no drop in signal strength was noticeable.
## TYPES & PRICES.

<table>
<thead>
<tr>
<th>2 VOLT</th>
<th>4 VOLT</th>
<th>6 VOLT</th>
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<tr>
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<td>3.7 volts.</td>
<td>Filament 5.6 volts.</td>
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<td>...0.1 amp.</td>
<td>...0.1 amp.</td>
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<tr>
<td>Impedance 16,000 ohms.</td>
<td>Impedance 6,000 ohms.</td>
<td>Impedance 6,000 ohms.</td>
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<tr>
<td>Amplification 10.</td>
<td>Amplification 3.75.</td>
<td>Amplification 3.5.</td>
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**An excellent valve for H.F. amplification and resistance capacity coupling. It is also to be recommended as a detector valve.**

**Price 14/-**

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<th><strong>L.F.</strong>&lt;br&gt;S.T. 22.</th>
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<th><strong>POWER</strong>&lt;br&gt;S.T. 62.</th>
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<td>...0.1 amp.</td>
<td>...0.1 amp.</td>
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<td>Amplification 10.</td>
<td>Amplification 3.75.</td>
<td>Amplification 3.5.</td>
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**This valve is for the first stage of a low frequency amplifier and will give undistorted reproduction. It may also be used for H.F. amplification, especially in superheterodyne circuits, and for detection.**

**Price 14/-**

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<table>
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<th><strong>POWER</strong>&lt;br&gt;S.T. 23.</th>
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<th><strong>SUPER POWER</strong>&lt;br&gt;S.T. 63.</th>
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<td>Filament 5.6 volts.</td>
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<tr>
<td>...0.15 amp.</td>
<td>...0.25 amp.</td>
<td>...0.25 amp.</td>
</tr>
<tr>
<td>Anode 80–120 volts.</td>
<td>Anode 120 volts.</td>
<td>Anode 120 volts.</td>
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<tr>
<td>Impedance 4,000 ohms.</td>
<td>Impedance 3,000 ohms.</td>
<td>Impedance 3,000 ohms.</td>
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**A magnificent 2 volt power valve giving superb reproduction when used as the last valve of a set when a loudspeaker is employed. Note its low impedance and the high amplification factor for such a valve.**

**Price 18/6**

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<th><strong>POWER</strong>&lt;br&gt;S.T. 42.</th>
<th><strong>SUPER POWER</strong>&lt;br&gt;S.T. 43.</th>
<th><strong>SUPER POWER</strong>&lt;br&gt;S.T. 63.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament 3.8 volts.</td>
<td>3.8 volts.</td>
<td>Filament 5.6 volts.</td>
</tr>
<tr>
<td>...0.1 amp.</td>
<td>...0.25 amp.</td>
<td>...0.25 amp.</td>
</tr>
<tr>
<td>Anode 40–120 volts.</td>
<td>Anode 120 volts.</td>
<td>Anode 120 volts.</td>
</tr>
<tr>
<td>Impedance 4,000 ohms.</td>
<td>Impedance 3,000 ohms.</td>
<td>Impedance 3,000 ohms.</td>
</tr>
</tbody>
</table>

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**An excellent power amplifier recommended for first and also the second stage of L.F. although the S.T. 43 is the ideal loudspeaker valve in the 4 volt class.**

**Price 18/-**

---

**Power amplifier is the best of its class and makes a good 1st and 2nd L.F. valve. It is intended especially as a good all-round power valve.**

**Price 18/-**

---

**This valve is the only standard 4 volt valve in the super power class, hitherto confined to 6 volt valves. It is "the valve with the golden voice" and is capable of great volume and exceptional purity of tone.**

**Price 18/6**

---

**The valve with the golden voice. It is an entirely new class of valve having very long dead-straight dynamic curve giving exquisitely pure loudspeaker reproduction.**

**Price 22/6**

---

*Ad. of S.T. Ltd., 2, Melbourne Place, W.C.2.*

*Tell the Advertiser you saw it in MODERN WIRELESS.*
Cossor Valve Chart for Radio Press Sets

In view of the considerable number of these designs now available and their wide variation in appeal, we have prepared a special chart to assist valve users in selecting the correct types of Cossor Valves to use. This chart embodies the results of our own investigations in combination with the staff of Radio Press, Ltd., and should be carefully followed if the best results are to be obtained.

The Elstree Six

For this set you will require three Cossor Point One Red Band Valves, and three Stentor Two's. Apply 120 volts to H.T. +2, and commence with 60 volts on H.T. +1. This latter voltage may need adjusting for the best results. The grid bias voltages on the last two valves should be 3 volts with 100 volts H.T.

The Distaflex

We recommend the use of two Stentor Two Valves for the first two stages, a Point One Black Band for the detector valve, and two Stentor Two's for the low frequency stages. Apply 70 volts to H.T. +2 for the H.F. valves, 60 volts to H.T. +1 for the detector, while the voltage on H.T. +1 for the low frequency valves may be anything up to 150 volts. Grid bias voltage of 3 or 4 volts on G.B. +2 and G.B. -2, according to the H.T. voltage on the note marginal.

The Elstree Solderyne

Here you want two Point One Red Band Valves for the first two stages, a Point One Black Band for the detector valve, and two Stentor Two's for the low frequency stages. Apply 70 volts to H.T. +2 for the H.F. valves, 60 volts to H.T. +1 for the detector, while the voltage on H.T. +1 for the low frequency valves may be anything up to 150 volts. Grid bias voltage of 3 or 4 volts on G.B. +2 and G.B. -2, according to the H.T. voltage on the note marginal.

The Distaflex

The Spanspace Three

We recommend the following combination. One Point One Red Band, one Black Band and one Stentor Two. The anode voltage for the first two valves may be 60 to 70 volts, while for the L.F. valve the voltage may be pushed up, the maximum being 120 volts. Grid bias up to 6 volts with the maximum H.T.

The Mewflex

This being a Reflex Receiver, a somewhat unusual arrangement of valves is called for, the following being the order: One Point One Red Band, one Stentor Two, and one Point One Black Band, for the first, second and third stages respectively. Apply 60-70 volts on H.T. +1 for the detector, and up to 120 on H.T. +2 for the first and reflex valves. The grid bias battery should be of 3 or 4 volts according to the anode voltage.

The Magic Five

The combination of Cossor Valves recommended for this receiver is three Point One Red Band Valves followed by two Stentor Two's. Apply 70 volts to H.T. +2 and 100 to H.T. +1. The grid bias battery should be provided with tappings from 1 to 5 volts upwards, as G.B. will need 3 volts, G.B.2 and G.B.3 requiring from 3 to 6 volts according to the H.T. voltage.

Types and Prices:

<table>
<thead>
<tr>
<th>Type</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Band</td>
<td>14/-</td>
</tr>
<tr>
<td>Red Band</td>
<td>14/-</td>
</tr>
<tr>
<td>Stentor Two</td>
<td>18/6</td>
</tr>
</tbody>
</table>

Visit a success, including arranging visits to valve works, high-power stations, and other points of interest, and for the way they studied my personal comfort. As a final paragraph, I was given a message to deliver to Radio Press readers to the effect that should they be in Amsterdam, if they will call at the office at Achtburgvare, 75, they will receive a cordial welcome.

St. John's Wood,

THE WINNER'S STORY
(Concluded from page 541)

AN INEXPENSIVE RADIO PRESS STAR SET

A FURTHER addition to the series of Radio Press Star Sets is the "Spanspace Three," a set with which it is possible to obtain high selectivity combined with complete stability. These desirable features are incorporated in a set which is by no means expensive to construct, the total cost of the components required, including the cabinet, being in the neighbourhood of £8.

The "Spanspace Three" is described by G. P. Kendall, B.Sc., in the November issue of the Wireless Constructor, which is now on sale.

A further attraction of this issue of the Wireless Constructor, and one which makes it all the more vital that you should secure your copy at once, is the inclusion of a Free Gift Constructional Envelope describing how to make the "Midget Reflex" receiver. This envelope is similar in style to the Radio Press envelopes, normally sold at 2s. 6d., and contains photographs and full-size blue prints. The Free Gift of the "Midget Reflex" constructional envelope will create an enormous demand for the November issue of the Wireless Constructor, and you should make sure of your copy at once. The price is 6d., as usual.

Cossor Valves


Tell the Advertiser you saw it in "MODERN WIRELESS."
As the writer hinted in a previous article on the subject of short-wave reception, the novice to this branch of wireless will quickly find out that the only way in which a short-wave receiver differs from an ordinary broadcast set is that the coils have fewer turns, the condensers are smaller, and the spacing of the components must be planned rather more carefully, in order to eliminate any slight losses which might prove troublesome on these short waves.

A Difficulty

The chief difficulty which besets the beginner, however, is usually that he does not know what to listen for, or even, in some cases, on what wavelength he is listening. Although there are many commercial stations working on the shorter waves which might serve admirably as “landmarks,” several of them work simultaneously on three or four wavelengths, and are thus apt to cause trouble.

45 Metres

If the reader is familiar with the Morse code, he will at once be able to identify the wavelengths of 45 metres or thereabouts, since this is the wave allotted for use by British amateurs. At most times of day or night at least twenty or thirty of them can usually be heard, so that there will be little doubt about that particular wavelength!

The procedure adopted by amateur stations when calling one another is very well known, but for the benefit of the absolute newcomer to this type of work a few words on the subject will not be out of place.

Intermediates

Each country in which amateur stations are licensed is allotted an “intermediate” letter or letters, which are sent immediately before the call-sign of the station, and serve to identify him. A list of these letters appears on this page. These “intermediates” serve as a very useful and clear indication of the location of any trans-

---

**NATIONALITY PREFIXES OR “INTERMEDIATES”**

| A: Australia                     | EG: Egypt                        | MF: Morocco                     | SS: Straits Settlements |
| AI: Tripoli, Africa             | F: France                        | N: Holland                      | T: Poland               |
| AU: Alaska                      | FI: French Indo-China            | O: South Africa                 | TJ: Trans-Jordania      |
| B: Belgium                      | G: Great Britain                 | OE: Austria                     | TU: Tunis               |
| BE: Bermuda                     | GI: Northern Ireland             | P: Portugal and Madeira         | U: United States        |
| BO: Bolivia                     | GW: Irish Free State             | PE: Palestine                   | W: Hungary              |
| BZ: Brazil                      | H: Switzerland                  | PI: Philippine Islands          | X: Portable             |
| C: Canada                       | I: Italy                        | PR: Porto Rico                  | Y: Uruguay and India    |
| CH: Chile                       | IC: Iceland                     | Q: Cuba                        | YS: Yugo Slavia         |
| CO: Colombia                    | J: Japan                        | R: Argentine and Russia         | Z: New Zealand          |
| CR: Costa Rica                  | K: Germany                      |                             |                      |
| CS: Czecho-Slovakia             | KY: Kenya Colony                |                             |                      |
| CZ: Canal Zone, Panama          | L: Luxembourg                   |                             |                      |
| D: Denmark                      | LA: Norway                      |                             |                      |
| E: Spain                        | M: Mexico                       |                             |                      |

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597
FOR THE SHORT-WAVE NOVICE—(Concluded)

A few years ago. In the issue of Wireless published on July 31, the writer described an “All-Wave Single-Valve Set,” in which “Dinic” coils were used. These are quite suitable for short-wave reception on account of the low-capacity mounting employed in conjunction with them. Short-wave low-loss coils with the standard plug-and-socket base are marketed by at least one firm, and there is no reason why a receiver should not be used in conjunction with plug-in coils to cover all ranges from 15 to 20,000 metres.

Size of Condensers

The condensers, however, are apt to be rather troublesome in this case, since .0002 is quite a large value when we are concerned with waves between, say, 30 and 50 metres; anything larger may be unmanageable. Normally, a broadcast set would employ variable condensers with a capacity higher than this, generally about .0005. An easy way out of the difficulty is to make some arrangement whereby a small fixed condenser can be connected in series with the variable. The effective capacity of the latter may thus be reduced to a convenient value.

Layout

As far as the lay-out of an “all-wave” receiver is concerned, the chief point is, of course, to keep the coils in such positions that their fields will be quite clear of any large metal objects, such as L.F. transformers, variable condenser end plates, etc.

Aerial Coupling

The method of coupling the aerial to the set also needs a little alteration; it will certainly not do to take it direct on to the grid condenser—the receiver will not oscillate in these circumstances. It may, however, be connected to this point in series with a very small condenser, such as one of the many makes of neutralising condensers now on the market. Alternatively, it may be coupled inductively to the set, or may be tapped on to the grid coil at a point near the filament end.
THE "All-British Six"
(to be described in the next issue of the "Wireless Constructor")
uses Copex O.C. Coils
(with the patented feature).

THIS Receiver won the third prize in the recent New York International Competition for Amateur Constructors' Sets (Multi-Valve Section). The successful entrant was Mr. H. F. Hassall, of London, who thus gained the highest award for any European entry. Mr. Hassall will describe his set in next month's issue of the "Wireless Constructor."

We definitely state that this Receiver is superior to any other Six-Valve Set now on the market. The principal advantages of Copex O.C. Coils over all other screened coils are:

1. Oscillation is rendered perfectly ideal control.
2. High Amplification.

These factors are due to an improved and patented method of construction. Here are the prices of Copex Coils:

- Copex Copper Screen and 6-pin base... 15/-
- Copex O.C. Type Split Secondary Transformer 250, 500M... 10/6

Patents and Sale Manufactures—
PETO-SCOTT Co., Ltd., 77, City Rd., E.C.1
Branches at 63, High Holborn, W.C.1, Wallington, Plymouth & Liverpool.
Copied by Many—Equalled by None

The "Eelex" Multiple Connector
Price 5/6 Complete

Non-reversible, detachable name plates, built with Eelex standardised Plugs and Sockets. All parts are standard, detachable and interchangeable. Coloured flexibles can be supplied in the following colours: red, blue, green, yellow, black, white and maroon at 6d. per yard. If at any time sets change so that multiple connectors are no longer required, then the parts can be put to other uses. It will pay you to adopt the Eelex Standardised system of Connections.

Send to-day for the Free ELEX List M.W.3
Eelex House, 1's Bushill Row.

600 Tell the Advertiser you saw it in "Modern Wireless."
THE "SOLODYNE"
A READER'S OPINION

Sir,—It is with very great pleasure that I give you herewith my results with the "Solodyne."

May I say, first of all, that I was doubtful that "one knob control" would be efficient, and so I left out the L.F. circuit and also used an old panel.

The wiring was finished on Sunday at 2.30 p.m., when I had a try out. As, judging by the state of the ether, several hundred others were also trying out, I switched off and waited for 3.30.

By 3.50 p.m. (i.e., within 20 minutes) I had neutralised, adjusted the variable condensers and received eight stations. In the evening I made a "tour" of the dial, but was much too interested to log anything. It was astonishing to hear station after station come in as the dial was rotated.

On Monday night I added a stage of L.F. Please note,—One stage L.F. Result: 32 stations on the loud-speaker.

A number of others were heard, but not logged as they were not loud-speaker strength. A further stage of L.F. would no doubt have brought these up, and the volume control would certainly have been needed to reduce the strength of a number of the 32.

Last night I went round the stations again and had the same excellent results. Need I say that I am highly satisfied? As the set is so ridiculously easy to operate, why not call it a family set?

In conclusion, may I congratulate you on the production of such a wonderfully efficient circuit?—Yours truly,

D. F. HOGAN.
Sheffield.

SCREENED COILS

The design of the screened coils used in Radio Press sets is the result of a careful combination of high efficiency and compactness. After experiments at Elstree certain standards have been found necessary and unless these are adhered to loss of efficiency may result.

At the time of going to press the following have been examined by Elstree and found to conform to the standard specification: —Bower-Lowe, Collinson, Cope, Evesca, Lewcos, Magnum.

MODERN WIRELESS
EXPERTS IN RADIO ACOUSTICS SINCE 1908

IS THIS WHAT YOU'RE LOOKING FOR?

TESTING the new 2-valve receiver at our Works at Slough, on a standard P.M.G. aerial, we tuned in the two Paris stations, London, Daventry, Bournemouth, Birmingham and Newcastle on the loudspeaker. This despite bad screening set up by a large power station not more than 50 yards from the vicinity of the laboratory. We were testing on 66 volts only. You can expect even better from the 3-valve Brandeset.

THE BRANDESET II.
The new Brandes 2-valve set features simplicity of control and ingenious compactness. Condenser dial, filament rheostat, reaction dial and "throw over" switch for long or short wave tuning complete the panel controls. Straight line frequency condenser tuning and grid bias is employed. The standard coil is suitable for Daventry and no "plug-in" coil need be purchased. The L.T., H.T., and grid bias leads are plated into one cable from rear of set.

£6 10

(Exclusive of Marconi Royalty and Accessories.)

THE BRANDESET III.
The new Brandes 3-valve receiver employs the same ingenious characteristics as the Brandeset II, except that an extra stage of Audio Frequency is employed. It has straight line frequency condenser tuning, grid bias, and is adapted to long and short wave tuning. Both receivers give most excellent loudspeaker reproduction on a number of stations, and are specially designed for this purpose.

£8 10

(Exclusive of Marconi Royalty and Accessories.)

Brandes
From any reputable Dealer.

BRANDES LIMITED 296 REGENT ST. W.1

Tell the Advertiser you saw it in "Modern Wireless."
Performance tells

The long period of research and expert workmanship that have produced "Powquip" Components would have been of no avail if the components had failed to give not only good, but perfect performance. The All-Europe Loud Speaker Set, described in "Amateur Wireless" as wonderful results obtained are only possible with the use of "Powquip" Components. A new folder giving full details of this set and the "Powquip Coil" and "Wireless" Booklets, which will give you extra help, can be obtained on application to your dealer or the address below.

POWQUIP COMPONENTS

Make good sets better.

The All-Europe Set and "Powquip" Components will be on view at:

STAND 63, MANCHESTER WIRELESS EXHIBITION.

THE POWER EQUIPMENT CO., LTD.
Kingsbury Works, The Hyde, Hendon, N.W.9

ETHERPLUS GRID LEAK

1/6 Etherplus Grid Leak 1/6 each

The only efficient medium priced Grid Leak. Guaranteed to be within 5% of the stated resistance. Absolutely reliable under all climatic conditions. Resistance from 25 to 3 Megohms.

From all dealers or from 915, Whitcross St., LONDON, E.C.I.

FORMO COMPONENTS

ULTRA LOW LOSS

Instant 125a Frequency Condenser

THE FORMO COMPANY,
Cromer House, Clapham Park, S.W.2

Phone: Highgate, 2028

Manchester: Mr. T. J. Lewis,
36 Farley Rd., Fallowfield.

Phone: Didsbury 3262

See page 673 for Formo Transformer.
News in
Advertisements

A special high voltage blocking condenser for use in battery eliminators, working off the electric light mains, has been placed on the market by the Telegraph Condenser Company.

* * *

A loud-speaker on the easy payment system is advertised by W. Bullen.

* * *

A three-valve set, tunable from 40 to 2,500 metres, with silver oxydised metal panel and cabinet to match, is advertised for £7 10s. complete with all accessories, including loud-speaker by Beard and Fitch, Ltd.

* * *

The Duvarileak, a new variable grid leak, is announced by the Dubilier Condenser Co., Ltd.

* * *

Mewat, Gent and Co. advertise an H.T. battery eliminator working off A.C. mains.

* * *

A new accumulator for use with dull emitter valves is being advertised by Oldham and Sons, Ltd., of Manchester.

A Reader's Results
with
The "Elstree Six"

Sir,—I have built an "Elstree Six," and have had it in use during the last three weeks. I can get all the B.B.C. main stations on the loud-speaker during daylight or dark, and a large number of the Continental stations in daylight or dark, all tuned in on the loud-speaker, without any use of 'phones.

On an indoor aerial of insulated wire, about 40 feet long, strung four times across the room from the picture moulding, starting with Aberdeen, which is our local station, I can put the following stations on the loud-speaker: Aberdeen, Leipzig, Radio-Toulouse, Rome, Glasgow, Newcastle, Dublin, Hamburg, Bournemouth, Union Radio Madrid, Prague and London.

With best wishes for your continued success on the road to further improvements. — Yours truly,

Peterhead.

A. W. Cardno.

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!

AUDIO TRANSFORMERS

The Brandes 1st stage Transformer has a high voltage amplification ratio of 1:3. This, together with a straight line amplification curve, means that the amplification is constant over a wide band of frequencies, thus eliminating resonance.

Ratio 1:3 (black case).

17/6

MATCHED TONE HEADPHONES

The whole secret of Matched Tone is that one receiver refuses to have any quarrel with its twin. Adly schooled in these acoustic sentiments by our specially erected Matched Tone apparatus, their synchronized effect discovers greater sensitivity and volume and true tone. There is no possibility of the sound from one earpiece being half a tone lower than its mate.

20/-

Brandes

From any Reputable Dealer

BRANDES LIMITED - 296 REGENT ST., W.1

Tell the Advertiser you saw it in "Modern Wireless."
POINTS ABOUT BATTERY ELIMINATORS

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

The use of alternating current mains for a variety of wireless purposes is becoming increasingly popular. We have on the one hand a fair number of devices for charging low-tension accumulators from the alternating current mains. Such devices usually consist of a transformer which reduces the voltage of the mains to something of the same order as that of the battery. (Actually, of course, the secondary voltage is a little higher than the voltage of the batteries being charged, so that it can pass a current against the back E.M.F. of the battery itself.) The low-voltage alternating current is then rectified either by means of a mechanical arrangement such as a vibrating reed, or by some other form of rectifier such as the Nodon valve, or some arrangement of this nature.

Charging H.T. Batteries

Another application of the alternating current mains is to the charging of high-tension accumulators. In such cases the step-down transformer may usually be dispensed with, and it is then only necessary to connect the mains direct on to the accumulator to be charged through a suitable rectifying device. If the rectifier is of a saturating type, such as, for example, an ordinary two-electrode valve, then this is all that is required, because the valve will not pass more than a certain current, and in this way the charge is more or less self-regulating somewhat as in the charging set which appeared in last month’s issue.

If, on the other hand, the rectifier is not limiting, then it is necessary to see that the voltages are in the correct relation. For example, if the current were not to be possible to charge a 60-volt accumulator direct from mains with a rectifier which was not limiting, and it would be necessary in this case to utilise a step-down transformer to reduce the voltage of the mains to something like 80 to 100 volts.

Battery Eliminators

Apart from the charging of H.T. accumulators, we have an increasing number of battery eliminators, the purpose of which is to supply high-tension voltage for the receiver direct from the mains without the use of any accumulator or any other battery. Such arrangements comprise—firstly, a rectifying system which converts the alternating current into unidirectional current; secondly, a smoothing system is necessary in order to smooth out the variation and fluctuation on the rectified A.C., and so convert it into more or less unvarying direct current, and finally there is usually some arrangement to enable different values of high-tension voltage to be tapped off the units, so obtaining different anode potentials suitable for the different stages in the receiver.

Underlying Principles

Now there is no doubt that arrangements such as these will be used in increasing quantities in the future, and it is desirable, therefore, that the user or prospective user should have some idea of the underlying principles upon which their operation is based. The average man has some idea that alternating current mains produce current.

The smoothing condensers used in A.C. work should have an adequate factor of safety against breakdown.

which goes backwards and forwards, and by the use of these various devices one half of the current is...
Cheaper and Better Jacks
Ashley Radio Jacks are made of nickel silver springs, with pure silver contact and Bakelite insulation throughout. Tags are timed and spread fan wise for easy soldering.

Showing: how tags are fanned.

| 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 Dbl. Control 2/3 |

Telephone Plug

Price 1/6
Occupies less space than any other Plug. Metal parts, high nickelled and polished. Bakelite insulation throughout, suitable for spade or pin tags, and any type of flexible or solder wire connection.

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

Tell the Advertiser you saw it in "MODERN WIRELESS."

Points About Battery Eliminators—(Contd.)
wiped out, leaving only the currents in the same direction.

While this theory is correct in its essentials, there is one or two points upon which further information is desirable, and I propose in this article to dwell upon the theory of rectified alternating currents in a little greater detail. The subject is one of considerable interest and is also quite simple if tackled from common-sense principles. It is necessary, however, to go into the subject more or less from the beginning in order to obtain a clear idea of what is actually happening.

A.C. Waveform

Now the alternating voltage supplied by the ordinary house wiring mains is of the form shown

Battery charging units effect a considerable saving in cases where both H.T. and L.T. accumulators are used.

in Fig. 1. In one instant the voltage is zero. It then commences to grow in strength until it reaches a maximum, after which it dies away again to zero. It now commences to grow to a maximum again, but this time in the opposite direction, after which it once more falls to zero.

Thus the actual value of the voltage across the mains is continually varying, and this periodic change takes place many times per second. The actual number of complete changes per second—that is to say, between the points A and B in Fig. 1—is known as the periodicity or frequency of the system.

Frequency Values

In this country there is a diversity of frequencies. In the early days when alternating current was

ELIMINATE RADIO H.T. BATTERIES!

Use the A.C. Mains.

Absolutely silent in operation. Ample anode voltage and current. All component parts can be supplied separately if desired. The output is ample for even a large receiving set—20 milliamps with a variable detector voltage and amplifier voltage of 160.

Price, complete in metal case with connecting plug .. £7 15 0

Plus Marconi Royalty, 12s. 6d.

Ask for Leaflet 123A.
POINTS ABOUT BATTERY ELIMINATORS—(Contd.)

first introduced, there was a tendency to design the electrical side of the plant to suit the steam-engine or other prime mover which was provided, and which in the majority of cases was already in existence. This led to the adoption of all sorts of freak values of frequency.

is produced. If a current is passed through a wire, then a certain heating effect is obtained depending upon the resistance of the conductor and the amount of current flowing through it. If an alternating current is passed through the same wire, the heating effect is still

Fig. 3.—Showing how the A.C. wave form finally becomes a simple D.C. ripple after rectification and smoothing.

Standardisation

There is a distinct tendency nowadays, however, to the adoption of a single frequency of 50 cycles per second, although for power work the frequency of 25 cycles per second is also used to a considerable extent. In America, on the other hand, everything is standard 60-cycle frequency, and this naturally considerably simplifies the design of apparatus, not only in the wireless field, but throughout the whole electrical industry.

Voltage Rating

Now with a direct current mains we specify the actual voltage between two mains, and this is fixed and definite in value. What are we to specify, however, in the case of alternating current mains, where the value of the voltage is continually fluctuating? The same difficulty arises in the case of an alternating current, and this gives the clue, as it were, to the method of defining the value of an alternating current. The value is so chosen that the

Fig. 4.—The theoretical circuit of a double wave rectifier. To retain simplicity the filament connections to the valves are not shown.

produced, and this gives the clue, as it were, to the method of defining the value of an alternating current. The value is so chosen that the

H.T. units of this type may be plugged into any existing lamp socket.

If, therefore, we pass an alternating current which fluctuates in a similar manner to that of the voltage, and whatever arrangement of specification is adopted it must be suitable for both voltage and current.

Now there is one property of current which is always the same, and that is the heating effect which

nating current through a wire and obtain a certain increase in temperature, we can then pass a direct current through the wire and obtain the same temperature rise. If the value of the direct current, as measured by an ordinary ammeter, is 3 amperes, then the value of the
Utility
GUARANTEED
COMPONENTS

Wireless enthusiasts who “know” fit “Utility” Components. Here is the “Utility” Low Loss Condenser. The centre spindle rotates on ball bearings, all brass parts are nickel plated, pigtail connection from moving plates, one end plate only is used and all sources of loss have been reduced to a minimum. There is no better Condenser than “Utility”—and no difficulty in obtaining genuine “Utility” Components. since all good dealers stock them.

Insist upon “Utility” No-Capacity Change Over Switch, Micro Dial, Jack and Plug, Push-Pull Switch.

WILKINS & WRIGHT LTD
KENYON ST. BIRMINGHAM

CAXTON 4-VALVE CABINET
Made for Sets “All Concert Receiver,” “Fieldless Coil Three Valve Set,” “Any Valve Low Frequency Amplifier.” Special Cabinets made to customer’s measurements. Prices quoted.

Cash with Order. Fumed Oak ... £1 5 0
Dark or Jacobean Oak ... ... £1 10 0
Real Mahogany ... ... £1 14 0
Detachable 7” deep Base Board to mount 16” by 8” panel to slide out of Cabinet front.
The two beaded front doors as illustrated, placed 2 ins. in front of the enclosed panel at 10/- extra.

Ebonite or Radion Panels Supplied and perfectly Fitted at low extra cost.

All Polished with the new enamel that gives a glass hard surface that cannot be soiled or scratched. SENT FREE.—Catalogue of standard Wireless Cabinets in various sizes and woods.

Packed and delivered free in U.K.

CAXTON WOOD TURNERY CO., Market Harborough

The Secret of CRYSTAL SET EFFICIENCY
Stability—the essential to satisfactory crystal reception—is dependent on the Crystal Detector. The perfect detector is practically unaffected by vibration, remaining stable where other types would fail.

“DUCO” CRYSTAL DETECTORS guarantee stability. Their design and construction provide for rigidity, and the micrometer movement ensures the very finest adjustment. Supplied in two models—perfectly dustproof—these detectors are appreciated by thousands of Crystal Set users, and are available at exceptionally low prices.

SPECIFY “DUCO” TO YOUR DEALER.

Brown Brothers
THOMSON and BROWN BROTHERS LTD
120, George St., Edinburgh, and Branches.

Tell the Advertiser you saw it in “MODERN WIRELESS.”
alternating current is said to be 3 amperes as well.

Root-Mean-Square Value

Now, obviously, the actual heating effect will vary from instant to instant. When the current is zero there is no heating effect at all, and when the current is at a maximum we have a much larger heating effect. The temperature which the wire will attain if an alternating current is passed through it, therefore, is the result of a mean heating effect which will be something less than the maximum.

Actually the heating effect in a wire can be shown to depend upon the square of the current at any instant. Therefore the mean heating effect is proportional to the mean value of the square of the current at each instant. The equivalent mean value of the current, therefore, is the square root of this mean-square value, and this has given rise to the expression root-mean-square value of the current or voltage.

This somewhat complicated way of choosing a mean value is necessary owing to the fact that the heating effect (and in general the power produced in any electrical circuit) is proportional to the square of the current, or what is the equivalent, the product of the voltage and the current. The actual average value of the current itself is a different value altogether, and

![Fig. 5 - the rectified voltage after two-wave rectification is as shown above.](image)

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Fig. 5 — the rectified voltage after two-wave rectification is as shown above.

is actually somewhat less than the root-mean-square or R.M.S. value. In the case of an ordinary alternating current of sine wave form, the R.M.S. value is 1.1 times the mean value.

Maximum Voltage

The point which should be noted is that the rated value of any alternating current mains is considerably less than the maximum voltage, which may be nearly 50 per cent. higher than the R.M.S. or rated value. This fact was mentioned last month in discussing the H.T. charging unit, and it is a point which is often overlooked. It has an important bearing upon the design of apparatus for operation of alternating current mains, since the various components have to be designed to withstand a higher voltage than appears to be the case at first sight.

Smoothing Condensers

This particularly refers to the use of condensers in smoothing units and similar devices. It is necessary in such to employ fairly large condensers to act as reservoirs or smoothing condensers in such circuits and so to reduce the fluctuation to a small value. The circuit shown in Fig. 2 is a representative case. Here the alternating voltage from the mains is stepped down to a suitable value by means of the transformer. The output from the

---

**A word from Professor Low**

"There seems no end to their utility, and I have seldom come across apparatus so capable of hard use without requiring any attention whatever. They are excellent in every way."

(Signed) A. M. LOW.

---

**PHILIPS H.T. SUPPLY UNIT**

GIVES AN UNLIMITED AND STEADY FLOW OF CURRENT THAT WILL OPERATE A SET OF ANY SIZE AT A COST THAT IS ALMOST NEGLECTIBLE. WHILE IN ACTION IT IS PERFECTLY CLEAN AND SILENT.

Price Complete £7.10.0


Tell the Advertiser you saw it in "MODERN WIRELESS."
secondary of the transformer is then rectified by means of an ordinary two-electrode valve, and this gives us pulsating currents of the form shown in Fig. 3 (b).

These pulsating currents may be considered as being made up of a mean value and a ripple or fluctuation on top. Now we have to eliminate this ripple as far as possible, and leave ourselves with the steady component of the rectified voltage, and this is done by a combination of choke coils and condensers.

The condensers take a little time to charge up, and this tends to resist the rise in voltage above the mean value, while they also take a certain time to discharge and thus oppose any fall in the voltage on the other hand.

**Choke Coils**

The choke coils, while offering very little opposition to the direct current, tend to oppose any change in the current, and thus further assist in reducing the actual value of the fluctuation. The final result, therefore, is that the voltage output appears somewhat as shown in Fig. 3 (c), which will be seen to be a constant value with only comparatively small fluctuations.

**Double-Wave Rectifiers**

In Fig. 4 we have a double-wave rectifier in which both halves of the alternating current have been rectified. This arrangement demands the use of a split-transformer, so that one half of the wave can go through one rectifying valve and the other half through the other one. The two rectified outputs are arranged to be both in the same direction, and the

---

**THE ELLIPTICON**

*Registered Trade Mark*

The new Brandes Cone. Undoubtedly the best loudspeaker produced, & brings tone of great depth and sweetness. The cone has a large vibrating area and a driving unit of special design. The magnets in the unit are unusually large. There is no diaphragm but a small armature which, actuated on the "push-pull" principle, reacts to the faintest impulse. The specially designed cabinet "reflects" the sound in rich and mellifluous tones.

- **Height**: 131 ins.
- **Depth**: 73 ins.
- **Width**: 104 ins.

**£5 10**

---

**THE TABLECONE**

Attractive cabinet of unique design, finished in dark walnut. The cone unit is fitted with a large magnet and the circular diaphragm has an extremely sensitive driving unit which provides plenty of volume with undiminished tone. Supplied complete with cord connection. It has a genuine claim to be superior to any similarly priced cone speaker.

- **Height**: 20 ins.
- **Depth (at base)**: 14 ins.
- **Breadth**: 12 ins.

**£2 15**

---

**Brandes**

*From any reputable Dealer.*

---

**TWO NEW CONE SPEAKERS**

The Ellipticon has been described as "the best loudspeaker on the market" by one who is fully qualified to judge, and who has no personal interest in our success. And we honestly consider that it is one of the best instruments we have ever turned out. The Tablecone, too, can really be said to be superior to similarly priced Cones.
Dear Sirs,

I recently purchased three of your Four Point Newey Condensers for test. I had them so wired up in my receiver that on pushing down a switch I had another set of condensers made by — in circuit.

On the 24th of September, at 2.34 a.m., I was able to tune in the whole of the Dempsey-Tannery fight, from both K.D.K.A. and Station 2X.H.F., each about R.S. On pushing over the switch and tuning round I could receive nil except X's and worse.

They are the finest piece of workmanship I know of.

Yours faithfully,

(Signed) M. F. W.

6/10/26.

The original of the above letter can be seen at our offices, Phonos House, Bucknall Street, W.C.2.

The Newey Four Point Condenser is perfectly designed and constructed, and is made by All-British Labour in All-British Factories from the finest available materials.

PRICE complete with knob and dial: .005 mfd., 17/6 .0003 mfd., 15/6

THE NEWEY VERNIER COIL HOLDER

A perfectly constructed coil holder, designed for back of panel One-hole fixing, and in addition provided with lugs for fixing in any position on panel. Backing moulding throughout. Worm geared by means of metal segment and worm, and fitted with patent stop plate to prevent overwinding in extreme positions — gives accurate ratios to 1, giving fine critical tuning and permitting the use of the heaviest coil.

PRICE - 7/6

NEWEY SNAP TERMINALS.
The Terminal with 1,000 uses.
No Set complete without them.

The use of these Snap Terminals which have been reduced in price and are now only
1d. each (nickel plated 1/4d.).

Ensures Convenience, Simplicity, Multipurpose, Certain Contact, Finish.

Experimental sets in boxes.


Ask your nearest dealer for the Newey Catalogue of Radio Components. If you have any difficulty, write direct.

POINTS ABOUT BATTERY ELIMINATORS—(Contd.)

resultant rectified voltage before smoothing is as shown in Fig. 5. It will be seen here that the ripples are of twice the frequency and are also not so serious in character. The higher the frequency of the fluctuations the more readily can they be smoothed out, since the size of the condensers and choke coils necessary is considerably smaller. For this reason it is customary to use double-wave rectification where possible, since this considerably simplifies the smoothing operation.

An Important Point

The particular point to notice is that the smoothing condensers connected across the output circuits have to withstand the full value of the alternating voltage. The rectified output before smoothing rises from zero to the full value of the alternating current, and consequently the condenser must be able to withstand this voltage, which, as we have seen, is considerably in excess of the average value.

Shunting Values

Owing to the size of the condensers required, which are of the order of 2 to 4 microfarads or more, it is customary to employ paper-insulated condensers of the Mainsbridge pattern. These condensers are constructed with a specially prepared paper having a metal deposit on one side which forms the plates of the condenser itself, while the paper constitutes the insulation. The material is actually a specially prepared form of the ordinary paper often used for wrapping up.

(Concluded on page 610)
Neutralising Condenser

MESSRS. Peto Scott Co., Ltd., have sent us one of their new pattern of neutralising condensers for test.

In this component the spindle which carries the moving plates passes through a bush located in the centre of a bridge piece of insulating material, which is carried at the top of two pillars of similar substance fixed to the base. This forms the main bearing of the spindle, the bottom bearing being carried in a small metal bush screwed into the base. The fixed plates are placed well away from the moving plates, so as to obtain a low minimum, which is further provided for by the special curved shape of the opposing edges of the plates. The spindle is provided with a lock nut, so that the condenser may be locked, after the correct setting is obtained. Terminals or soldering tags may be employed when making connections.

It should be noted that two terminals are provided, one at either end of the bridge piece which carries the spindle for the moving vanes, but only one of these is in actual contact with the spindle. Care should, therefore, be taken to ensure that the terminal to which connection is made is the right one.

On test the component showed a minimum capacity of 2 micro-micro-

Battery Switch

MESSRS. Rotherham Radio Corporation of Great Britain Ltd. have submitted to us for test one of their "Yaxley" battery switches.

As the name implies, this component is intended for insertion in one of the battery leads for use as an "on-and-off" switch. A small lever actuates a cam made of insulating material, which presses against a spring contact as the knob is rotated, thus closing the circuit. Connections may be made by means of two soldering tags, and a positive stop is provided for "on" and "off" positions, which are indicated by means of a small engraved plate placed in position on the panel under the fixing nut.

The lever on the switch knob also serves to lock the knob on the spindle, and it is provided with a knurled end for easy withdrawal.

We can recommend this component as being a workmanlike job, and it provides a satisfactory means of making or breaking the low-tension circuit.

Panel Brackets

MESSRS. Burne-Jones and Co., Ltd., have sent us samples of their "Magnum" Panel Brackets for test. These brackets, which appear to be constructed of cast aluminium, though light in weight, are solid and robust in construction, while both faces have been machined so that when in use the panel will be held at true right angles to the baseboard.

Each arm of the brackets is provided with two holes for fixing purposes, and this accessory can be recommended in cases where heavy components are mounted on the panel.

Filament Rheostat

We have received samples of baseboard mounting Filament Rheostats from Messrs. Lissen, Ltd.

These rheostats are similar in construction to their well-known panel mounting type in that the winding is carried on a strip of insulating material which is bent round a
THE NEW MAGNETIC MICROPHONE BAR AMPLIFIER

An efficient NON-VALVE NOTE AMPLIFIER which yields Three to Ten-fold Amplification from the Phone Terminals of any Crystal or Valve Set.

NO ACCUMULATORS REQUIRED, NO H.T. BATTERIES.

Six pairs of Wireless Headphones, or any 4,000-ohms Loud Speaker may be operated from a single 3-volt Dry Battery.

LOW CURRENT CONSUMPTION

The Magnetic Microphone Bar Amplifier uses less than 1/10 of an ampere, one 3-volt dry cell, at a cost of 3s., lasting upwards of 300 working hours.

No Diaphragms, No Distortion. No fragile parts. Nothing to get out of order. No mechanical points. Unaffected by vibration. Compact and easily portable. ANYONE CAN ADJUST IT.

Amplified Speech and Music as clear as from a good Valve Set. A boon to persons of impaired hearing.

PRICE complete 38/-

No separate Transformer required.

OF INTEREST TO MUSIC LOVERS.

Horns for Lisztinsky Gramophone Attachment.

Prices... 5 in. 7 in. 9 in. 10 in. 12 in.

Prices are 15/6 21/6 25/6 17/6

Swan-neck pattern, 1/- extra.

We stock components, valves, and accessories of every description for sets described in this and in all other Wireless Publications. We have a highly-organised and efficient Mail Order Department, and guarantee not only safe but prompt delivery. Why waste time and money when you can send your order direct to us. Your enquiries will receive our careful and prompt attention.

Economic Electric Ltd. 10 FITZROY sq. LONDON W.1

The Variable Grid Leak that remains variable

No Dubilier product is placed on the market until we can be absolutely certain of its giving perfectly satisfactory performance in use.

The Duvarileak has been in the experimental stage for three years.

The final result is that this Grid Leak will show a smooth and uniform variation of resistance from zero to five million ohms. More important still, by successfully discovering a resistance element of extremely hard surface and by arranging a ball-bearing contact (see inset) we have assured that the wear in operation will be negligible.

This means that the Duvarileak will, throughout its life, give a constant resistance value for any given setting of the dial.

Like all Dubilier products, the Duvarileak can be relied upon to give the utmost efficiency in service—it is, in fact, the perfect variable Grid Leak at last.

As seen in the illustration, it has one-hole fixing and a dial scale by which the resistance may be set.

The Duvocon for Loud Speaker Volume control is the same in appearance and price as the Duvarileak, and is suitable for use with any Loud Speaker.

Price 7/6 of all Dealers.


Tell the Advertiser you saw it in "Modern Wireless."
moulded insulating former. Terminals or soldering tags are provided for making connections, while a special short spindle is employed so that the rheostat may be mounted flat on the baseboard. The resistance can be set to any required value within its limits, and so long as an "on" and "off" switch is included in circuit need not be altered again.

The rheostats received were of the bright emitter type, and when placed on test it was found that they all had a resistance of 7 ohms, which is the figure given by the makers. The maximum position gives less than one-tenth of an ohm, while the wire employed is of a heavy gauge, so that several amperes can be passed through this resistance without overheating.

This component is robust in construction, and can be recommended for use.

Duros High-tension Unit

MESSRS. A.F.A. Accumulators Ltd. have sent us one of their Duros high-tension units.

This unit is of monoblock construction, compact in size and light in weight. When discharged at a rate of 60 milliamperes its capacity is stated to be 1,800 milliamper hours.

The plates are separated from each other by a strip moulded into the glass container, while the top of the cell is filled in with pitch, tappings being provided at every 2 volts. The vent plugs are held together on a common strip of indiarubber, this being an excellent idea, since the single vent plugs do not get lost.

Several of these units have been in use for some months as a 60-volt high-tension battery, and when originally charged their voltage was found to be in the neighbourhood of 66 volts. After two months' use the voltage still registers above 60, and the cells appear to be in excellent condition in every way; the battery is silent in action.

The makers advise giving this cell a slight balancing charge every four to five weeks, but this has not been found necessary in the case of the unit under test.

Although we have not as yet been able to give this cell a very stringent test, the results so far obtained are very favourable, and we have no hesitation in recommending this high-tension unit.

Velvet Contact Rheostat

MESSRS. M. and A. Wolff have sent us one of their "Ether-plus" velvet rheostats for test.

The resistance element of this component is carried on a strip of fibre round which it is wound, the fibre being bent in a circle, and the two ends being fixed to a small metal bracket. The spindle which carries the moving contact to the resistance passes through a bush fixed in the centre of the metal bracket, this bush also serving to fix the component to the panel. A small moulded knob provided with a pointer serves to control the amount of resistance in the circuit, while a clearly marked scale is provided with the instrument.

When placed on test it was found that the value of the resistance was exactly 30 ohms, which is the maker's rating. The moving contact was extremely light and amply bears out the maker's claim of velvet contact.

The component is neat and compact in construction, and its general finish is satisfactory. We can recommend it for all purposes where a 30-ohm resistance capable of carrying about half an ampere is required.
TESTED BY Ourselves

(Concluded)

"Formo" Variable Condenser

We have received a Straight-Line-Frequency Condenser for test from Messrs. Formo, Ltd.

The construction of this component incorporates several novel features. Only a single bearing is employed, and this is of the cone type, arrangements being made for adjustments in the case of wearing. The stator plates are supported at one place only, the insulation being arranged so as to be out of the main field of the condenser.

As in most S.L.F. condensers, the vanes are somewhat long, and in order to eliminate any possibility of irregular spacing at the tip, small supports to both the rotor and stator vanes have been fitted. The component is of the one-hole fixing type, and is provided with a standard quarter-spindle for the

The Formo S.L.F. variable condenser.

--

dial. Connections may be made to it either by terminals or soldering tags, as desired, while, as an additional means for connecting to the rotor plates, a copper pigtail is provided.

The capacity of the condenser is rated at .0003 by the makers and when placed on test its actual value was found to be .0003. Its minimum value was .0001 while at broadcast frequencies its losses were negligible.

The instrument is robustly constructed and well finished, and can be fully recommended.

A Remarkable Record

The long line of successes which has marked the growth of Varley Bi-Duplex Wire Wound Anode Resistances constitutes a truly remarkable record. Practically all the "Star" sets of 1926—sets which but recently have won high International Honours both in New York and Amsterdam—contain our famous Resistances. We reprint below a letter we have received from the winner of the Premier Award at the Amsterdam Radio Exhibition.

5, St. Ann's Terrace,
10th October, 1926.

Messrs. The Varley Magnet Co.

Dear Sirs,—I am very pleased to tell you I have succeeded in winning the Gold Medal at Amsterdam with an "Eldreu-Six." When I constructed this set I was very careful to select my parts not for price but efficiency, and so doing I selected your Anode Resistances which in my opinion are a very shielful and workmanlike product. I have used a great number of these in the course of my experiments and sometimes they have carried 250-300 volts, but I have never found one that has failed yet, a fact which speaks very highly for them. Anyone who uses Resistances and wishes for a reliable one cannot do better than select the Varley.

I am, yours faithfully,
(Sd.) R. W. Emerson.

Varley Anode Resistances have achieved a still more remarkable record in that only one out of the enormous numbers sold has been returned as faulty.

Readers will be interested to know that the Varley Multi-cellular H.F. Choke is ideal for the "Entune Six," the "Entune Roby," the "Daylow Three," etc., sets which were published prior to the marketing of this remarkably efficient component.

Descriptive leaflets giving full particulars of sizes, prices, etc., can be sent.

THE VARLEY MAGNET CO.
Proprietors, Oliver Pell Control, Ltd.,
Granville House, Arundel Street,

615
packets of tea. Such condensers are quite satisfactory in use, provided they are suitably chosen for the particular circuit in which they are to be employed.

**Factor of Safety**

Obviously, these condensers will not stand up to such a high voltage as a mica or oil-insulated condenser, but to obtain the requisite capacity with mica insulation would not only be extremely expensive, but would also be excessively bulky. Moreover, with suitable precautions the paper-insulated condenser is perfectly satisfactory and there is no need to go to the extra expense. In many cases, however, this heavy strain on the condensers is not sufficiently appreciated, and condensers are employed having an inadequate factor of safety.

The usual type of paper-insulated condenser is tested at a D.C. voltage of 300 volts. This gives an adequate factor of safety where the condenser is used as a by-pass condenser in a receiver, where the maximum H.T. voltage is 120 or 150 volts. In the case of a smoothing unit, however, it is quite possible that this factor of safety would not be sufficient.

**Breakdown Possible**

Let us consider the case of a battery eliminator or similar device designed to operate off 240 volt mains. Now 240 volts as we have seen is the rated or R.M.S. value of the mains, and the peak value is considerably higher. With the usual type of sinusoidal wave form, the actual peak value is 1.41 times the R.M.S. value, and in this case works out at 340 volts approximately. Now, if the condensers used in the smoothing unit have only been tested up to 300 volts, it will be seen that there is a possibility of a breakdown occurring.

With a 200 volts supply the peak value would be 280 volts, so that if this were all that had to be considered with the ordinary type of condenser would be satisfactory. There is always, however, the possibility of a sudden surge on the line which may cause a momentary rise in the voltage which would put a strain on the condenser considerably over the rated 300 volts.

**High Voltage Condensers**

There are on the market condensers of this paper-insulated type which are provided with special insulation, and are actually tested on 600 volts D.C.

This, therefore, is a case where the first trouble is the least, and if a mains unit is being designed to operate off a fairly high voltage of over 150 volts, then it is preferable to use the 600 volts type of condenser and so avoid risk of possible breakdown in service.

---

The vernier movement comprises three sets of enclosed precision machine-cut gears, and reduces the speed of the moving block by eight times.

Side plates, coil blocks, and knobs in artistic bakelite mouldings. All metal parts heavily nickel plated. Made for left as well as right hand.

---

**Lotus Vernier Coil Holders**

Made by the makers of the famous Lotus Buoyancy Valve Holder.

Garnett, Whiteley & Co., Ltd.,
Lotus Works, Broad Green Rd., Liverpool.

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Tell the Advertiser you saw it in "Modern Wireless."
--electric light in your home--?

IF SO WHY NOT GET YOUR H.T. SUPPLY FROMTHEMAINS?

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

TUDORADIO MAINS UNITS

can be connected to the nearest lamp socket. Current consumption is negligible, and trouble some and expensive 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:

THE TUDORADIO COMPANY, LIMITED.
Tel: or Works, Park Royal, London, N.W. 10.
Telephone: Woolley 41.

OTHER MODELS FOR OTHER SETS

A LEADING valve manufacturer reports that "exceptionally good loudspeaker results" were obtained with the Watmel Auto-Choke. "Speech was clear and sharp and music free from distortion."

Get full particulars of Watmel Auto-Choke, Grid Leak, and Combined Fixed Grid Leak and Fixed Conductor from your dealer, or write direct to manufacturers.

USE WatMel PRODUCTS

THE WATMEL WIRELESS CO., LTD.,
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Telephone: Clerkswell 7990.

Representative for Lancs, Yorks and Cheshire:
Mr. J. B. LEVEE, 23, Hartley St., Levenshulme, Manchester.

100% EFFICIENCY H.T. BATTERY

Constructors' ideals realised. As tested "M.W." April, 1924, etc. Brass-terminaled Gaunt Unit Dry cells, 90 per cent. efficiency (compare standard cells). 12 volts, 1.8 volt, 16/6, carriage 1½. Replacement cells, 4½ oz. plus carriage. Every cell replaceable. Suits only for set H.T., 2½ oz. Sample cell on or at card. Lists free. Prompt delivery. Direct only from maker, saving 50 per cent.

C. A. FINCHETT. Old Amery, Quenby.
**Mewflex Receiver**

**A winner**

**REGISTERED TRADE MARK**

This set won second prize and a special cup at the NEW YORK INTERNATIONAL COMPETITION. It was fitted with a BECOL EBONITE PANEL.

**Panel supplied in the following finishes:**

- Size 24 in. by 8 in. by 3 in. R quality mat... 7/6
- Mahogany grained polished.......................... 16/
- Superfine polished de luxe............................ 24/
- Terminal strip 6 in. by 2 in. by 1 in............ 8/

All leak-free and ready for use.

Extra for packing and postage (panel and strip) 1/-

Described in “Modern Wireless” Sept. issue.

Order immediately.

**The BRITISH EBONITE Co. Ltd.**


---

**5/- SECURES**

**“Bullphone Nightingale” Loud Speaker**

**Clear TONE**

Post your deposit of 5/- now and get by return the famous “Bullphone Nightingale” Loud Speaker.

Individually tested and guaranteed to be superior to any other Loud Speaker regardless of price, for finish, purity and strength of tone and volume. Cash Price 60/-, post free United Kingdom.

**Great Volume**

Specification—Height 21 in., Bell Mouth 14 in., Nickel Arm and Stand. Black crystal bell head, as photo. Also do luxe model, mahogany finish bell, same size, 65/- cash or 10/- deposit. Lift free.

**W. BULLEN (Dept. M.W.1), 38, Helywell Lane, Lom‘en, E.C.2.**

---

Tell the Advertiser you saw it in “Modern Wireless.”
The inside of the five-valve set (above) presents a very compact appearance. Below is seen the theoretical diagram of the circuit employed.

(Concluded from page 580.)

stations being tuned in at really good loud-speaker strength, the quality being also very good. Good loud-speaking was obtained from the local station with the H.F. stages cut out of circuit.

From the point of view of selectivity it was found that there was room for improvement. This deficiency in the matter of selectivity may be understood if the high-frequency portion of the circuit be compared with the neutralised tuned amplifiers now coming into general use.

Receivers built upon these amazingly compact lines present a strong appeal in view of the range and power obtainable from them, combined with simplicit of control.

FINSTON
Fixed Condensers
This season's improved model is worthy of replacing any you may have in your set.
Ruby Mica and Copper Foil Bakelite moulding, Quality Terminals and Sensible Soldering Taps.

Prices:
001-2-3-4-5-6 and 001 1. - each
002-3-4-5 and 001. - 1.9 each
Get them from your Dealer and write us for Complete Illustrated Folder of all Finston Components.

FINSTON MFG. CO., LTD.
46, Horseferry Road, London, S.W.I

LUSTROLUX
The Safety Valve

UNLESS you use the British Made LUSTROLUX your dull emitter valves call for two-point-something or three-point-something volts. Do you use a 4-volt supply, feed through the resistors—and trust to luck about over-loading.

LUSTROLUX Valve put an end to all that! Whether you want a 0.6 H.F. Det. or L.F. or a power valve at 34 amps. the LUSTROLUX Valve calls for 2 Volts only.

Arrange your coils in parallel and get added hours per charge. Lustrolux reception is perfection, and Lustrolux costs are amazingly low. 26 Dull Emitters, 9... .54 Power Valve, 11-
Manchester & Liverpool and
LUSTROLUX LTD., West Bellingham, nr. Macdonald.
Find our Catalogue "A".

COLVERN SCREENED
and Low Loss Inductance Former

Complete long wave and short wave coil kits wound to standard specification.

The Elettroflex... 5 s. d.
The Magic Five... 4 7 6
The Electre Selodyne... 4 9 6
The Monial... 5 10 0
The Mosulex... 4 14 6
The Screwded Coil Tires... 2 17 0
The Distress Two... 4 14 6
A Three-Valve Trap Receiver... 1 13 6

COLLISON PRECISION
SCREW CO., LTD.,
Proven Works, Macdonald Road.
Telephone—Walthamstow 532.

Copper Screw with Standard 8-pin Base... 8/6
Screen complete with Base and unwound Coil... 12/6
Former and base, unwound... 5/6
Former only... 4/6
Base... 1/6

Tell the Advertiser you saw it in "MODERN WIRELESS."
"Silvertown" Wireless Accessories

Quality guaranteed by over 50 years electrical manufacturing experience

SILVERTOWN
WIRELESS
ACCESSORIES

INCLUDE—

CONDENSERS (All type)
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VALVE-HOLDERS, ARCH-MICROPHONIC VERNIOMETERS
Etc., Etc.

INTERVALVE TRANSFORMER—Guaranteed for 12 months
Price 51s. each.
This Transformer has been adopted by leading manufacturers of Wireless Receiving Sets and discriminating amateurs in all parts of the world. Excellent results have been obtained on tests carried out by the National Physical Laboratory. Copy of the curve can be had on application.

THE SILVERTOWN COMPANY
108, Cannon St. London, E.C.4
Works: Silvertown, E.16.

BELFAST, GLASGOW, MANCHESTER
BIRMINGHAM, LEE, NEWCASTLE
LIVERPOOL, OXFORD, WINDSOR
CARDIFF, LONDON, PORTSMOUTH
DUBLIN, SHEFFIELD.

FINSTON

Puratone Valve Holder
The name of this valve holder agrees with the quality of reproduction secured when using them in your set. They eliminate all valve noises and absorb vibration interferences. AN IDEAL HOLDER FOR PERFECTLY PURE RECEPTION.

Price 2/6 each

(See illustration).

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The "Drawing Room Five," Panel Size: Oak, Mahogany
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HAND POLISHED, SOLID OAK OR MAHOGANY
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W. & T. LOCK, ST. PETER'S WORKS, BATH

Tell the Advertiser you saw it in "Modern Wireless."
THE "DRAWING ROOM FIVE"—(Concluded from page 535)

Aerial Connection

A suitable aerial coil should be inserted into the L₁ coil base and in the other a split-primary transformer, for the same wavelength range, should be used. With the valves plugged in, first connect the L.T. battery, and if the valves appear to light correctly connect the H.T. negative lead from the set, into the H.T. battery, join all positive leads together and take into a low voltage socket, of the order of 4 or 6 volts, noting whether the valves light more brilliantly. If they do not so it is probable that all is correct and the voltages previously indicated should be employed for the various valves or groups of valves.

The Radio Choke

On the lower broadcast range a No. 250 or 300 plug-in coil will serve for the radio frequency choke, but if coils for the 1,000-2,000 metre range are obtained a large choke will be required, Nos. 400 or 500 proving satisfactory.

Neutralising

The neutralising of the H.F. valve is usually by no means critical, and the procedure I generally adopt is to tune the local station with the first valve extinguished, by placing the first base-plate, and then adjusting the neutralising condenser it will be found that a point occurs where signals are reduced to minimum strength or disappear entirely.

Preliminary Testing

For a preliminary test place the reaction condenser, that is, the right-hand condenser at zero setting, and advance the two other tuning condensers by two or three degrees each at a time, when the local station should be heard. The tuning is sharp but throughout the whole lower broadcast range the points which I used, the variation between the two readings was not more than five degrees, so that searching is very easy.
A “PUSH-PULL THREE”  
(Concluded from page 557.)

Long Wave Reception

Should it be desired to receive upon the long wavelengths, the "fieldless" coil should be changed for one of long wave design; beyond this, however, the operation of the receiver is the same in every detail as that obtaining when receiving upon the ordinary broadcast band of wavelengths.

In the Crystal Palace district, where the reception of Daventry is not generally good, the present receiver gives quite good loudspeaker results without forcing the set to the limit of reaction adjustment, while Radio-Paris can also be received at much the same strength from the new building of the Crystal Palace having some weakening effect upon the Daventry signals.

Results

Though the receiver is not intended for distance work, and it is not suggested that it be used for that class of listening, it is nevertheless possible to tune in a number of stations other than the local one; and as a matter of interest, when using the receiver with telephones as the means of hearing, such stations as Birmingham, Manchester, Newcastle, Hamburg, Radio-Belgique, Cadiz, Leipzig and Frankfurt have been received at good strength.

Though some of these stations could be heard on the loud-speaker their volume does not justify, in my opinion, their being regarded as being received "on the loud-speaker"; nevertheless, they may be received at quite good telephone strength so long as the receiver is handled with due care and patience.

A LECTURE AND DEMONSTRATION

On November 9th a lecture and demonstration of the Elstree "Solodyne" will be given by Mr. J. H. Reyner, B.Sc. (Hons.), A.M.I.E.E., to the Bournville Radio Society, by whose courtesy we are enabled to offer a limited number of tickets to readers residing in the Birmingham district. Applications should be made at once to the Editor, Modern Wireless, Bush House, W.C.2. Envelopes should be marked "Lecture."
OVER 70 STATIONS on the "SOLODYNE"

Sir,—May I offer my most respectful congratulations to the Radio Press on your latest and most astounding Star Set. I have only one objection to raise: modesty, in moderation, is an admirable quality; but do not overdo it.

I only completed my "Solodyne" four days ago, and my dog already is not 50 but well over 70 stations! I must frankly confess that I am astonished at the results; and I should also like to add that I have never handled a set so delightfully easy to manipulate. It took me only two minutes to adjust the neutralising and the gang condensers, and in the next 50 minutes I had identified and logged 35 stations. I have since asked one or two friends of mine, who have never handled a set before, to sit down and tune in; they have done so with very nearly the same ease as I myself have experienced. My own frank opinion is that this set will to a very large extent knock the Super-Het, clean out of the market.

In conclusion I can only tender my very real gratitude to all who have contributed to put this set "into circulation," and to wish for it the success it so richly deserves.—Yours truly,

M. G. Ferguson.
Holmleigh, Buxton.

"WIRELESS," The One-Word Weekly.

A New Radio Press Star Receiver

— ▼ —

"WIRELESS," the one-word we-kly, is now running a series of articles describing the latest Radio Press Star Receiver—the "Monodial": four valves and only one dial.

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