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## CONGRATULATE "P.W." THIS WEEK

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June 4th, 1932.

# TEN YEARS OF PROGRESS

POPULAR WIRE

A MONTHLY JOURNAL OF THE WIRE INDUSTRY

No. 1, Vol. 1  
June 1935

# EPITOMISED BY

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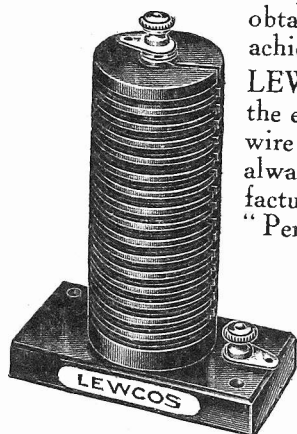
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## "P.W. DECADE"

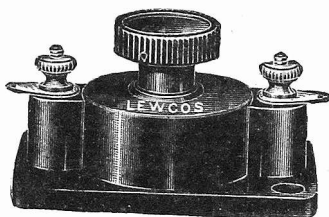
WHICH IS DESCRIBED IN THIS ISSUE

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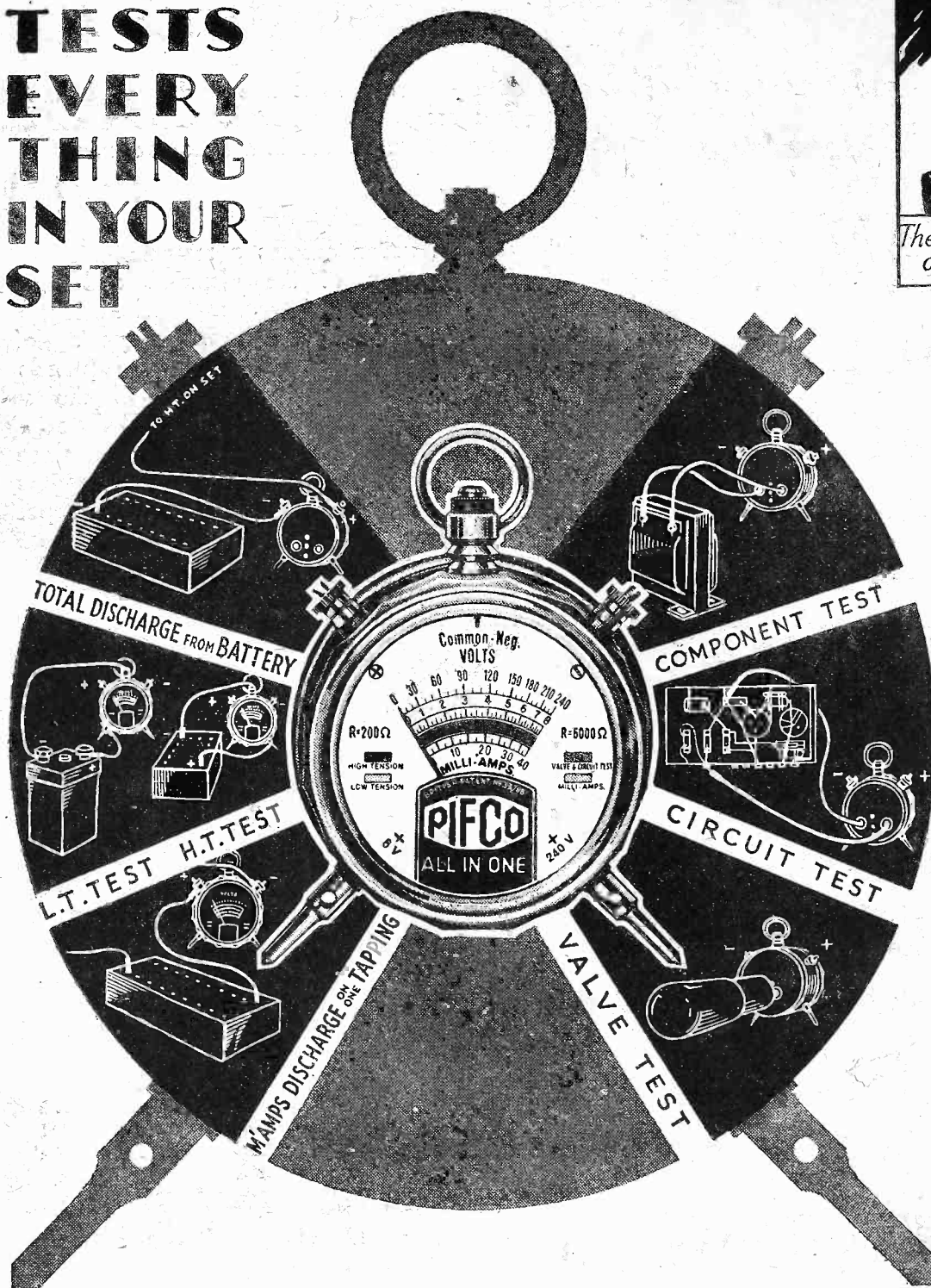
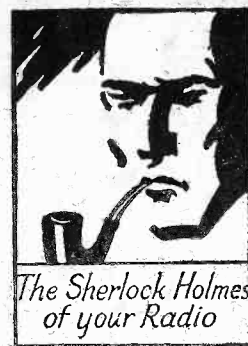
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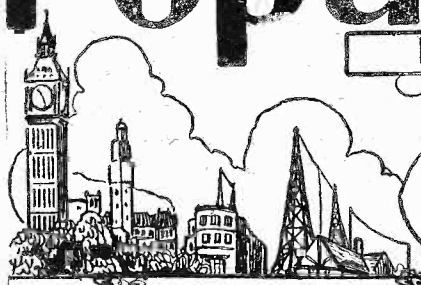
A copy of the 72-page Cossor Wireless Book B11 will be sent you free on application to A. C. Cossor Ltd., Melody Dept., Highbury Grove, London, N.5.

Get one of the new Cossor Station Charts price 2d. Ask your dealer for a copy of this useful novelty or write to us enclosing 2d. stamp.

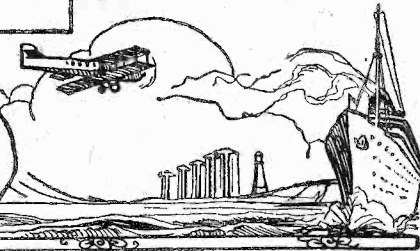


# Popular Wireless

**LARGEST NET SALES**



Scientific Adviser:  
Sir OLIVER LODGE, F.R.S.  
Chief Radio Consultant:  
CAPT. P. P. ECKERSLEY, M.I.E.E.  
Editor: NORMAN EDWARDS.  
Technical Editor: G. V. DOWDING, Associate I.E.E.  
Assistant Technical Editors:  
K. D. ROGERS, P. R. BIRD,  
A. JOHNSON RANDALL.



**OUR BIRTHDAY  
THANK YOU!  
PURPLE PATCH  
A FRIENDLY CRITIC**

## RADIO NOTES & NEWS

**WIRELESS AND HISTORY  
THE WEEKLY GEM  
THOSE CHICKENS  
NEWEST CRIME**

### Our Tenth Birthday.

WITH this issue of "P.W." we celebrate our tenth birthday. For ten years, or two lustrums, or one decade, we have brightened the bookstalls, popularised wireless, and edified, instructed, amused and contented an ever-growing number of people, till to-day we can, to our great satisfaction, say that we have the "largest radio circulation in the world."

It has been hard work but great fun, and we wouldn't have missed it for worlds.

### A Decade of Achievement.

HERE are a few of the choicer blooms in the bouquet with which we present ourselves to-day. To begin with, we led the way in revealing to the great body of non-technical listeners the secrets of wireless broadcasting receivers and in rendering intelligible to them the difficulties of wireless theory. We gave the first impetus to the home construction of popular broadcast receivers.

By instructing a large public in these matters we have helped to make broadcasting "safe for democracy" and have assisted the radio trade to get squarely on its feet.

### We Render Thanks.

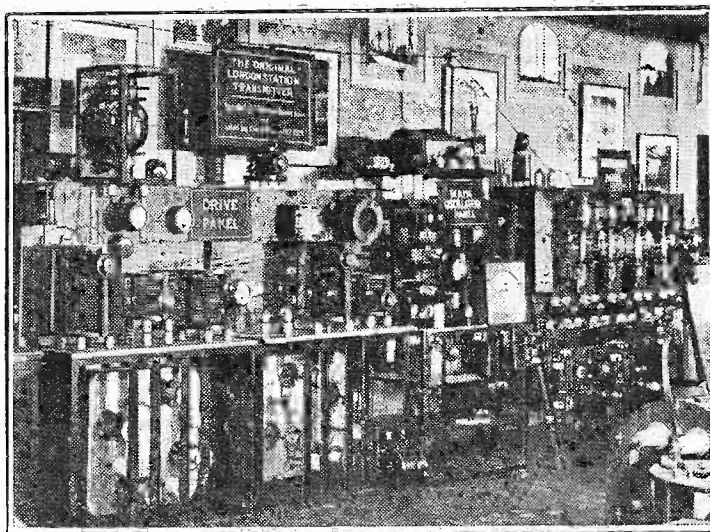
AND so, as we begin our second decade, we do hereby offer our hearty thanks to all our readers and to the thousands of them who from time to time have written such appreciative and interesting letters to us; to the "trade" for its peculiar blessings and support; to the B.B.C. and radio authorities all over the world for their beautiful supply of information and data; and last, but not least, to Sir Oliver Lodge, the Grand Old Man of wireless, for his lively interest and valuable

co-operation in our efforts to inculcate a sound appreciation of the principles of wireless communication.

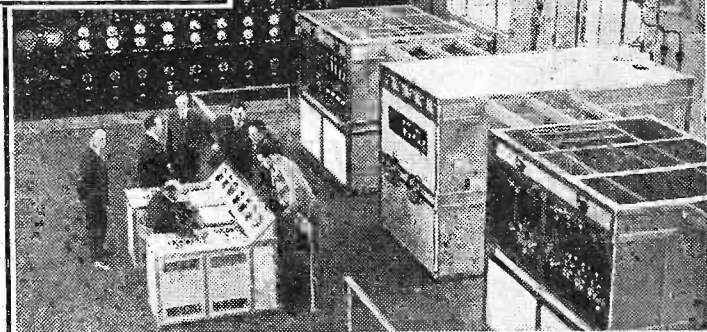
"Good-bye to All That."

I OBSERVE that here and there in the Press there have appeared adverse

### THE TRIUMPHS OF TECHNIQUE



Did you ever hear it?—the old, old 2 L O, of Marconi House, in the Strand? The aerial was for long a familiar sight to Londoners, but the station quickly migrated, the studios and control-rooms going to Savoy Hill. Then the aerial was taken to a better site, on Selridge's, in Oxford Street, and, finally, came Captain Eckersley's magnificent Regional scheme. The lower photograph shows one of the new Regional stations in all its glory of simplified efficiency.



criticisms of the B.B.C.'s farewell to Savoy Hill in the form of that broadcast panorama, "The End of Savoy Hill." Whilst I consider that it was the B.B.C.'s biggest auto-boost so far, I am of opinion that it was diabolically clever in construction and, so far as a listener could judge, a technical success.

But I failed to understand why the announcements of several events, such as the opening of a new station, were followed

by noises exactly like a locomotive engine blowing off steam. What was the great idea?

### A.B.C.—And Little More.

A FEW days before the great valedictory panorama was broadcast there was published a paper-covered, 96-page booklet, price one shilling, entitled "The A.B.C. of the B.B.C.," compiled by Sir Harry Brittain. It is dedicated to Marconi, but the largest portrait given is that of Sir John Reith, to whom, in a foreword, Lord Riddell "takes off his hat," though he includes the B.B.C. staff in that comprehensive gesture.

"A.B.C." is right. That state of knowledge appears to be the limit achieved in regard to radio, and some of even that elementary algebra has gone wrong.

### Why This Purple Patch?

A GOOD deal of information, doubtless authentic, is to be found here, but Sir Harry has knit the facts together into one large purple boost of the

—FROM 1922 TO 1932

B.B.C. by means of a lingo which he has borrowed from the "cub" reporter: "... voices singing through the dynamos." "And ceaselessly the giant dynamos will sing their song of power ... " "Long, white fingers are sensitively twitching knobs," and so forth.

Dynamos, skinny white fingers and, over all, the D. G.! What a picture of the B.B.C.! I'd give a lot to hear the D. G.'s  
(Continued on next page.)

# "ARIEL'S" RUNNING COMMENTARY ON RADIO (Continued)

private, unswayed opinion of this piece of prose.

## A Friendly Critic.

F. W. (Plymouth), with whom I have already had friendly converse, winds up a letter by the criticism that my Notes aren't so interesting as they were formerly, and naively asks me whether I have noticed it.



Jolly good, that! What does he expect me to say?

If that is his present view, I can ascribe it only to his loss of appetite for the new,

the topical and the progressive. Probably he has a jaded radio liver. Our rising circulation affirms that we are (blessed amongst journalists!) continuing to please and instruct!

## Wireless and History.

PROPOS Lt.-Commander Kenworthy's article in "P.W." for May 21st, and with particular reference to his remarks about the battle of Jutland, I have always understood that Admiral Jackson decided to send the fleet out for a "sweep" because our Wireless Intelligence discovered that the German flagship *had moved out* of the Jade River, his inference, which turned out to be right, being that the German fleet was "coming out."

I do not for a moment suggest that the gallant commander is mistaken, but my version, which I have read somewhere, is quite plausible—to a landlubber like "Ariel," who was on the Wireless Intelligence staff!

## Influence of Radio on Animals.

I AM a disappointed man. I have heard and read of such extraordinary effects of radio music on our little brothers, from parrots to pugs, that I expected great things from our latest boarder, a pedigree fox-terrier. But our Bill, as the family call it, seems to be deaf to all sounds except those which make noises like grub or rats.



A clatter of a dish or so rouses Bill like a fire-alarm; a shout of "rats" brings him up to attention out of an, apparently, deep sleep. But when we bring him up against a prize brass band he just hooks his darling chin over my foot, sighs deeply and goes to bye-bye.

## The Weekly Gem—Unpolished.

IN one of the technical electrical magazines I find this gem "of purest ray serene," published "without comment." Far be it from me to spoil a good joke by explaining it. The following is a bit of a broadcast message by an American company chairman.

"Any real understanding of electricity, like the germ of life itself, seems securely locked in the bosom of the unknown. A single generation brought forth the genius of Thomas Edison, George Westinghouse, and Charles P. Steinmetz, inventors and developers of this new force which has so greatly changed our lives."

Isn't it gorgeous? It ought to be engraved on both sides of the Faraday Medal.

## Edison Can Stand Alone.

A BIOGRAPHY of Thomas Alva Edison, "benefactor of mankind," by F. T. Miller, LL.D., Litt.D., is now published, and it makes, I understand, a most readable book, being a full life of the immortal inventor.

## "SHORT WAVES"

### VERY UNKIND

The only things worse than the broadcasting programmes are those things which are written about them!

Householder (to burglar, who is about to make off with the wireless set): "Wait a minute; I'll give you a hand with that."

She was only a radio announcer's daughter, but she stopped singing for the love of mike. "Sunday Pictorial."

"Does it make any difference to the results a portable receiver gives whether it is outdoors or indoors with windows, etc. closed?" asks a correspondent.

We strongly advise that this query be put to the test in the garden—the neighbours will supply the answer.

### OVERHEARD AT A CONCERT.

"You see that man with the stick? He's the conductor."

"Don't be funny; he's the insulator!"

### SHAKESPEARE ON WIRELESS.

"Tune your instrument!"—Taming of the Shrew.

"My ingenious instrument, Hark, it sounds!"—Cymbeline.

"One fading moment's mirth, with twenty watchful, weary, tedious nights."—Two Gentlemen of Verona.

"A cunning instrument, cased up."—Richard III.

Off in the stilly night  
Ere slumber's chain has bound me,  
The radio brings a blight  
Of noise around me.

Enthusiastic Salesman: "This wireless set, sir, is genuine Chippendale!"

There is, however, one grave flaw in its construction, namely, the definite claim that Edison was the inventor of the electric lamp. I thought cold facts disproved that claim in favour of Swan, and, though one would not care to wrestle about the point, one feels that as Edison's work easily qualifies him for a niche in the Hall of Fame, his glory does not require to be burnished by any belittling of the work of others.

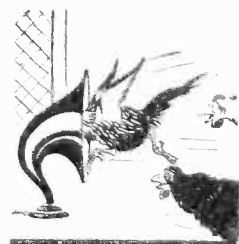
## Advertising By Radio.

A FINAL shot! I read in a well-known review that the chairman of the Federal Radio Commission (U.S.A.) recently warned broadcasters that they would do well to abolish sales talk "over the air," and that both in the States and Canada many advertisers are returning to newspaper advertising. My view is that,

although broadcasting may be a means of establishing contact with a huge public, it is a mistake to mix up advertising matter with entertainment.

## Broadcasting and Chickens!

A MAN I know, who runs a poultry farm in Berkshire—his wife actually runs it, but allows him to believe that he does—tells me that instead of calling "Coopy, coopy!" when feeding time comes he plants his loud-speaker out in the runs, on the end of a long lead, and the chickens come for it at break-neck speed.



He says that it isn't much of a compliment to the B.B.C. but that it would be very much less complimentary if he kept pigs instead of fowls!

## The Making of an Amateur.

TO the radio enthusiast who wishes to go further into his hobby and become a full-blown amateur with a complete receiving and sending station, I can recommend a new publication of the American Radio Relay League, namely, "How to Become a Radio Amateur." This booklet has twenty-nine fully illustrated pages covering the construction of receiver, transmitter and power supply unit, and advice about learning Morse.

## Where Radio Seems to Fail.

YOU remember the "Hamlet" à la Henry Ainley which was broadcast last month? I stayed up in my study and heard it out, whilst the rest of us imbued ourselves with tea and trifles.

A young visitor, aged seventeen, who declined "Hamlet" on that occasion, has recently seen the play at the Old Vic, where she waited for two hours to sit on a granite-hard seat "Wherefore?" I asked. "Because," said she, "the killings on the stage are more real and squishy!"



## The Very Newest Crime.

THERE is a very deep-dyed crime which is fundamentally known as "seroung-ing," but by the wit of men it has many variants, one of which is "tapping."

I confess that, as a choir-boy, I used to "tap" the small shot which weighted the organist's red baize curtains, to the advantage of my spring pistol! The Chinese tap the silver out of dollars, very cleverly, and on the proceeds buy magnificent coffins for themselves. But the very latest notion is to tap the radio relay wires with a safety-pin. A Clacton man thought of that! And the magistrate thought £1.

ARIEL.



# OUR BIRTHDAY POSTBAG

Greetings to "P.W." from some of our famous friends.

From our Scientific Adviser, Sir OLIVER LODGE, F.R.S.

Dear Sir,—I should like to congratulate you and your paper on its continued success, and hope that the next decade will see still further advances both in the science of radio transmission and in the kind of information and entertainment which is broadcast.

Yours sincerely,  
OLIVER LODGE.

From The MARCHESE MARCONI.

I heartily congratulate "Popular Wireless" upon the attainment of its tenth birthday.

Wireless broadcasting, with which "Popular Wireless" is particularly concerned, has passed through a decade of very rapid progress, and the Editor and his collaborators have earned the appreciation of a very wide circle of readers by the manner in which they have kept in touch with every new development, and have sustained enthusiasm and interest in the art and science of broadcasting.

CAPT. ECKERSLEY



As Chief Engineer of the B.B.C., he originated the Regional Scheme of twin-wave broadcasting.

From our Radio Consultant-in-Chief,

Capt. P. P. ECKERSLEY.

Dear Sir,—A decade! Many congratulations. My attitude towards you has been the same both as a pioneer of broadcasting and, later, as a regular contributor to your journal. I have felt that a popular and informed technical press, keeping alive, as it does, an

interest in technique, must be a considerable factor in the creation of technical progress.

More than that, a regular and technical critique of a broadcasting service is essential to the growth and health of the transmission monopoly.

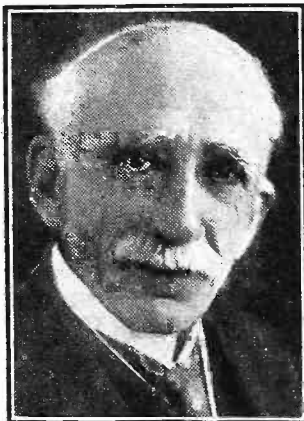
Alas! Even the press is insufficient in face of a growing rigidity and complacency of outlook in the B.B.C. to bring about that state of flux which, in the early days, made broadcasting an entertainment rather than an institution. The B.B.C. must not be allowed to subside into bureaucratic complacency. Technique must not be allowed to become too standardised.

Long may "Popular Wireless" counteract this vicious but all too obvious tendency, and long may it be a technical inspiration to those

who find wireless the most fascinating of hobbies.

Yours sincerely,  
P. P. ECKERSLEY.

SIR AMBROSE FLEMING



The inventor of the valve.

From SIR AMBROSE FLEMING, F.R.S.

Dear Sir,—A line to wish your journal many happy returns, and continued success and usefulness. Yours truly,  
AMBROSE FLEMING.

From SIR JOHN REITH, Director-General of the B.B.C.

Dear Sir,—Your tenth birthday should be an occasion of justifiable pride in steady progress and notable achievement. Wireless journals such as yours have been of material assistance to broadcasting, and it is pleasant to realise how you have prospered.

May you go forward to still greater success, incidentally developing that friendly, constructive criticism which is valuable not only because it helps the B.B.C., but also, I believe, because it is preferred by your readers to the kind of criticism that has little or no foundation in fact, and is animated by malice or caprice.

SIR OLIVER LODGE



Sir Oliver, who is "P.W.'s" Scientific Adviser, celebrates the 81st anniversary of his birth on June 12th. He invented tuning.

From READY RADIO, LTD.

Dear Sir,—The tenth birthday of that enterprising youngster, "Popular Wireless," is



an occasion which I feel calls for a special word of congratulation from all who have at heart the best interests of the home-construction movement in radio.

I myself have great faith in the future of that movement, for I believe that a determined forward policy and a refusal to be shackled by existing conventions on the part of those responsible for its development, can maintain it as the world's finest hobby.

I certainly regard "Popular Wireless" as one of the foremost exponents of that progressive policy.

Yours faithfully,  
J. W. HUSTLER,  
Managing-Director Ready Radio, Ltd.

From MESSRS. VARLEY.

Dear Sir,—May I, as a director of this firm,

venture to congratulate you upon this your tenth birthday number. To add a cipher to one's age is a notable event. To have weathered a decade of radio journalism is an outstanding achievement.

Ten years of steady solid progress is something to be proud of.

Yours sincerely,  
J.M.G. REES,  
Director.

MARCHESE MARCONI



Marchese Marconi, whose name is imperishably linked with all the first steps in radio.

From The PETO-SCOTT CO., LTD.

Dear Sir,—It is with pleasurable recollection of a very long-standing association that I am happy to be able to offer my hearty congratulations upon "P.W.'s" tenth birthday.

As you are no doubt aware our association with "P.W." dates back almost to your very first issue ten years ago, and it is extremely gratifying to reflect upon the almost phenomenal growth of interest in radio that has taken place during those years.

To-day there are more than four million licensees, many of whom have joined the ever-increasing ranks through the medium of "P.W.," and you are to be congratulated upon the part that you have played in providing such a remarkable selection of first-class designs, a policy in which we have endeavoured to support you and your readers by the provision of Authors' Kits.

(Continued on next page.)

WE are still passing through a very interesting period of change in long-distance reception conditions. I indicated some months ago that we might see, as the summer progressed and the sun-spot minimum drew nearer and nearer, a gradual tendency for the best "distance-getting" wavelengths on the medium-band to become shorter and shorter.

This forecast has been borne out in fact. With the exception of Brussels No. 1 (which at the moment of writing goes on from strength to strength!) stations above about 480 metres show a marked falling off—the higher you go the fewer, so to speak.

Budapest and Vienna have disappeared completely; you can't—or, at any rate, I can't—obtain so much as a whisper from Munich or Sundsvall and even the giant Prague has been reduced of late to a feeble little bleat on many nights.

#### Breaking the Rules.

Below the mark mentioned, though, there are some splendid transmissions. Possibly you have noticed that Sottens and Beromünster, like Brussels No. 1, are breaking all the rules by showing a distinct increase in strength, instead of a falling off, as high summer draws nearer. Another remarkable station at times is Lille, from which I have had very good reception in the broadest of broad daylight.

On the long waves both Huizen and Motala seem a little tired and Zeesen has on several recent occasions not been quite up

## STATIONS WORTH HEARING

Some practical distant-programme notes compiled by a special contributor who nightly searches the ether in order to obtain really up-to-the-minute information for "P.W." readers.

to the mark. The pick of the long-wavers are Radio-Paris, Kalundborg and Oslo.

Warsaw is varying a good deal; sometimes it is magnificent, but there are days when weakness is noticeable, and more than once a poisonous heterodyne has spoilt its programmes.

#### A Complete Eclipse.

The medium waves are full of surprises. Why, for instance, should the great Bordeaux station at comparatively short range (and separated from us mostly by sea water, one of the best of "conductors" for wireless waves) be so poor on most nights? Why should Göteborg, Prno and Breslau be often so wonderfully well heard? Why should Genoa come through on one or two nights a week at full loud-speaker strength and on other nights need the fullest measure of reaction to bring it up to audibility?

How is it that Kattowice, until recently one of the best of the Continentals, is at the moment suffering something very like a complete eclipse? Such things are wireless mysteries, and their occurrence adds enormously to the thrills and the interest of long-distance reception, particularly if one keeps a log.

As stand-by stations just now I would name Brussels No. 1, Langenberg, Beromünster, Sottens, Toulouse, the Poste Parisien, Hilversum and Heilsberg. These seem to be always there when required.

Good, but perhaps not so reliable as the aforementioned octet, are Gleiwitz, Leipzig, Turin, Trieste, Milan, Frankfurt, Stockholm, Rome and Florence.

In addition there are many stations that should not be neglected when you are conducting a tour round the medium wave-band. On some nights they may not be there at all, or they may be only just audible; but on others you will find them coming in as if every kilowatt was pulling its weight!

Examples of such stations are Berlin, Witzleben, Lwów, Hamburg, Stuttgart, Barcelona, Brussels No. 2, Breslau, Göteborg, Bratislava, Lille, Hörby and Nürnberg.

#### Medium Waves in Daylight.

There is certainly no dearth of receivable foreign stations and quite a number of those on the medium-wave band are still to be heard in the day-time. Choose an afternoon when there is no atmospheric interference, and try a search over the band, even if the sun is shining brightly.

If you have at least one good H.F. stage, and provided that your aerial and earth are up to the mark, I should be surprised if you failed to log at least four or five Continentals.

In conclusion, may I express the hope that this old association may be continued and that it may be my pleasure to offer congratulations when you have reached your next Decade.

Yours faithfully,

For and on behalf of  
**THE PETO-SCOTT CO., LTD.,**  
**W. SCOTT-WORTHINGTON,**  
Managing-Director.



Mr. J. M. G. Rees, Director of Messrs. Varley.

From  
**RADIO INSTRUMENTS, LTD.**

Dear Sir,—  
The tenth anniversary of "Popular Wireless" is of particular interest to me, as it almost coincides with the birth of this Company, of which I am Managing-Director.

During the past ten years the journal which you edit has come to be recognised as an institution for the radio-minded public. Its value to my Company is indicated by our record of continuous advertising in "Popular Wireless," as one of the most favourable channels for introducing our productions to radio readers and constructors.

### OUR BIRTHDAY POST-BAG

(Continued from previous page.)

The way "Popular Wireless" maintains its position as one of the leading wireless journals in Great Britain can be gathered from the enterprise which has enabled it to include amongst its staff many eminent technical contributors to radio science.

It is with pleasure that I offer you my sincere congratulations on the tenth birthday of your journal, with the wish that it will continue to



W. Scott-Worthington, Managing Director of the Peto-Scott Co., Ltd.

enjoy an even wider measure of success in the future.

Yours faithfully,

**J. JOSEPH,**  
Chairman and Managing-Director.

From  
**THE MARCONIPHONE CO., LTD.**

Heartly congratulations, "Popular Wireless," on the occasion of your tenth birthday.

You have played a great part in laying the foundations of the enormous public interest which is centred on Radio to-day. We find pleasure in looking back with you to the earliest days of broadcasting. Carry on as you have so far and you cannot fail to keep pace with the hectic development of this virile industry of ours.

Heartly congratulations.

**G. J. FRESHWATER,**  
Publicity Manager.



Mr. J. Joseph, Chairman and Managing Director of Radio Instruments, Ltd.





A GOOD deal has been written lately on the subject of the more popular kind of radio music, and many musical authorities seem to have joined in a bitter complaint against it. Yet, in my opinion, it is both generally approved and necessary.

#### A Broadminded View.

I am myself the first to agree that the best works of the early composers still stand almost unequalled; but, on the other hand, I see no reason why the art of composing music should be considered to have stopped a hundred years or so ago.

Only the most bigoted and illogical supporter of the ancients can seriously argue that everything which is not a parallel to a Bach fugue or a Chopin nocturne should be destroyed; yet that is practically what we have been told recently.

This arbitrary way of deciding what the public shall or shall not be given is manifestly absurd. The world moves faster now than, say, in Handel's day; just as we have superseded travel on horseback by travel in aeroplanes, so do we find more modern temperaments needing quicker and simpler music than heretofore, and something of an altogether lighter style of composition.

When we have the leisure to enjoy them, riding and Handel give us intense pleasure still; but for everyday use the flying-machine or the popular song and dance tune are more convenient and satisfactory to our hurrying, workaday, modern world.

#### Studying Public Taste.

I am a musician by profession, and it is as much my job to earn comforts (and luxuries when I can do so) for myself thereby as it is for a man to be a successful stockbroker or bank manager. Consequently, like these others, I have to study public taste, letting my musical capabilities serve the particular public which employs me, whether it be cinema audience, radio listeners, or what you will.

But, at least, the earning of money with my fiddle has helped me to be to this extent broadminded—that I recognise that genuine musical talent is to be found among modern work as well as among ancient, and that a capable conductor can avail himself of his orchestra's powers to get the maximum beauty and the greatest amount of musical effect when playing this more modern style

The world-famous violinist and conductor, who was one of the first musicians to give regular broadcasts in this country, and enjoyed a wonderful degree of popularity, tells "P.W." readers about his methods and aims in the selection of radio music.

of work, by artistic use of instruments and orchestrations not known hitherto.

#### Methods of Treatment.

Those who have heard my orchestra perform will probably realise that I do my best to make a popular number rise to its greatest possible height by novel orchestration, and a good deal of study or original methods of treatment.

In this way I endeavour, as far as is permissible, to demonstrate the *idea* which inspired the composer, and to develop his theme by obtaining all the effect

possible from the whole range of my orchestra's instruments.

#### The Older Works.

I need hardly say that I do not abandon all the compositions of the older masters of music—that would be serving the public just as badly as if I omitted all the work of the moderns.

If I give a fair proportion of popular numbers, I also have constant recourse to the age-old favourites composed by the great men of the past, presenting such work in its most simplified form so that it may be acceptable to all tastes.

After all, the greatest task of music is to amuse and give pleasure to the greatest number, and not merely to tickle the educated ear of the brilliant minority.

#### Reached by Radio.

And, although there are comparatively few people who fully appreciate the complete technicalities of the great masters, there are a very great many to whom their melodies make an irresistible appeal, and perhaps I am right in saying that more of such people are reached by radio than by any other vehicle of music.

This being so, it would be merely foolish of me to stand like a Canute, resolutely shutting my eyes to the rising tide of appreciation for all forms of more popular music.

Apart, again, from the two extremes of technical classic and simpler modern music, we have the ever-welcome melodies from French and Italian operas, which, though definitely debarred from inclusion in the category of classical music, are none the less delightful to the listener-in, and are always a pleasure to the performer.

#### A Happy Medium.

To suggest that these should be deleted from our radio programmes altogether would certainly be to risk a very great falling off in the popularity of wireless as a form of entertainment.

I myself endeavour, by rendering all kinds of popular music with the utmost consideration, and by popularising the classic compositions as much as is possible, to create a happy medium within the ken of all listeners; and if I can do so; then I shall rest well content.

#### A CHARACTERISTIC POSE



De Groot, who has delighted the hearts of many listeners with his fiddle.

## THE MIRROR OF THE B.B.C.

By O.H.M.

## A NOTABLE DEVELOPMENT

TRADE UNIONS ANGRY—WHERE WAS SIR JOHN?—ACCIDENT TO B.B.C. OFFICIAL—"MUSIC HALL."

ON Sunday, June 26th, there is to be a long broadcast of the main religious service at the Eucharistic Congress in Dublin. It so happens that this feature programme takes place on the third Sunday after the introduction of lunch-time music on Sunday. I imagine there was some discussion as to whether an alternative entertainment programme would be provided.

The decision, wisely I think, is that there is to be an entertainment alternative on the other wave-length. If the decision had gone otherwise, there would have been considerable indignation among Protestant listeners generally, and also Ulster listeners in particular. On the immediate issue, the B.B.C. has acted wisely, but perhaps without realising that an important new precedent has been created in admitting an entertainment alternative to a religious broadcast.

## Trade Unions Angry.

The Trades Union Congress and its subsidiary bodies are very upset about the references to the General Strike which were contained in Lance Sieveking's ten years' retrospect programme, which was billed as the "Farewell to Savoy Hill."

It will be recalled that when the Board of Governors was under review last year, strong representations were made to the Prime Minister to accept Mr. Citrine, General Secretary to the T.U.C., as a candidate for replacement of a retiring Governor. The feeling, then, was that something was needed to protect the "Left" view in the work of the B.B.C.

It is no secret that Mr. Citrine was the nominee of the T.U.C. The Prime Minister, however, turned down the suggestion, with the result that T.U.C. circles have been increasingly vigilant to discover signs of B.B.C. bias against them. Apparently, the first instance regarded as worthy of action was in Mr. Sieveking's programme at Savoy Hill.

I am told that the protest has been rendered in very strong terms, but loses a good deal of its "bite" by virtue of inaccuracy of quotation. It seems that the B.B.C. will have little difficulty in dealing with the situation, and that the T.U.C. will have to consider whether in future it might not be desirable to have shorthand notes taken of those broadcasts which might be expected to contain material offending to them.

## Where Was Sir John?

The Press view and opening of the B.B.C. transmitter for Scotland at Westerglen, described in this page a fortnight ago, has made a deep impression north of the Tweed. One point, however, still provides material for the gossip writers of the more popular newspapers.

This is the absence of Sir John Reith, who sent quite a squad of senior officials in his place. There is, of course, no great mystery. Sir John Reith, a Scotsman himself, has never made any secret of the

fact that he is grateful not to have to live in Scotland any longer.

His speech at a Scottish society in London last year created a first-class sensation. He took occasion to condemn a lot that is happening in the land of his birth, and his audience agreed!

## Accident to B.B.C. Official.

Mr. Percy W. Darnell is one of those B.B.C. officials whose work and usefulness

are in direct disproportion to the publicity they receive. Mr. Darnell was captured by the B.B.C. from Fleet Street about eight years ago, and has done very remarkable work, a good deal of which is of the confidential variety.

Mr. Darnell and his wife were returning from one of their missions for the B.B.C., when they encountered a motor accident for which, apparently, the responsibility was elsewhere. They were both seriously hurt, and all well-wishers of the B.B.C. will desire their early restoration to health.

## "Music Hall."

José Collins, John Tilley, Terence McGovern, Nomo King and Partner, G. H. Elliott and Jenny Howard are among the artistes engaged for the third music-hall vaudeville programme arranged for Saturday, June 11th.

## MUCH BETTER FOR THE SINGER NOW!



The soloist of to-day, when singing for a broadcast, is just as free to move as on a concert platform. But ten years ago, the mike had to be held close to the singer's mouth by the announcer, as depicted in the circle.

## THE LISTENER'S NOTEBOOK

A rapid review of some of the recent radio programmes.

THANKS to the more ample accommodation of Broadcasting House, the studio audience becomes a more potent factor than ever. It was evident that Gracie Fields and those in support were playing to capacity on the occasion of Music-Hall No. 2.

In fact, some of them played so exclusively to capacity that we listeners were made to feel that either we were eaves-dropping, or that we had got to find a convenient chink through which to peep while the bobby's back was turned.

## The Cold Shoulder.

Jay Laurier cold-shouldered us to such an extent that by the end of his turn he had quite forgotten the existence of the microphone (a new acquaintance, too—Shame!). Why was he so secretive with his

patter, and why weren't we invited to shout "George," or whatever it was? Never have I been left so in the cold!

Such treatment by artistes will not make us love the studio audience any better. They must remember, too, that anything they do at Broadcasting House is primarily for us. Surely the studio audience ought to do the chink-peeping, but if this concourse of folk is allowed to become so big that the artiste cannot ignore it, then let the B.B.C. advertise Music-Hall No. 3 as being relayed from "Studio No. Something" as they do a Palladium relay. We should know what to expect then.

However, I didn't—or wouldn't—let this apparent slight mar my enjoyment of the hour. There was quality in every turn, I thought, every artiste seeming

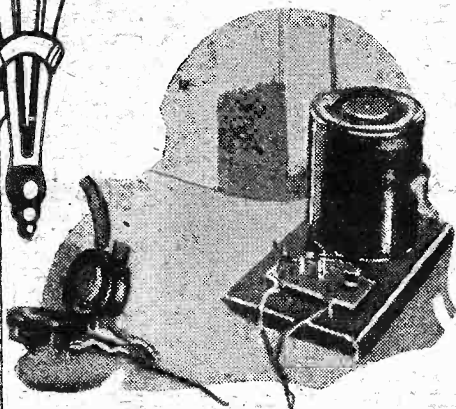
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# 1922 1932 TEN YEARS OF PROGRESS

A peep at the past, designed as an introduction to the "Decade"—a loudspeaker receiver which epitomises the work accomplished by the Technical Staff of "Popular Wireless" during the preceding ten years.

By G. V. DOWDING, Associate I.E.E. (Technical Editor).



## A CRYSTAL SET FOR 35/-.

This was the first set described in the very first number of "P.W." It made a great hit with the public despite the fact that in those days the parts cost 35/-.

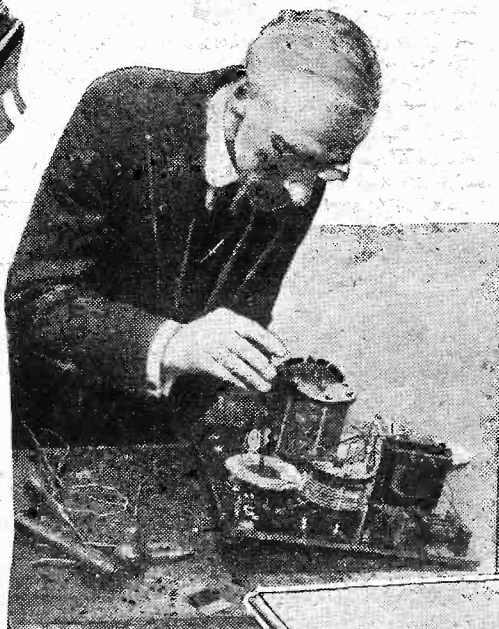
THE daily broadcasting of news, talks, and concerts is now so much a part of our social structure that many readers will find it hard to visualise the radio conditions which existed when "P.W." first made its appearance ten years ago.

The only British broadcasting then available was one twenty-five-minute concert transmitted every Tuesday evening from an experimental station at Writtle by Capt. P. P. Eckersley, who was later to be Chief Engineer of the B.B.C., and, finally, Radio Consultant-in-Chief to POPULAR WIRELESS.

## Our First Number.

But there was much talk of a national broadcasting system to arouse keen public interest, so that when Number One of "P.W." was published during the week ending June 3rd, 1922, it at once achieved a large circulation.

It would be wrong to say that "since then we have never looked back." We have, regularly, and with



THE OLD "COMBINATION." Above is a view of this very famous "P.W." set actually being constructed in our first research department.

considerable satisfaction, but only because the history of "P.W." is one of steadily increasing circulation and widening powers!

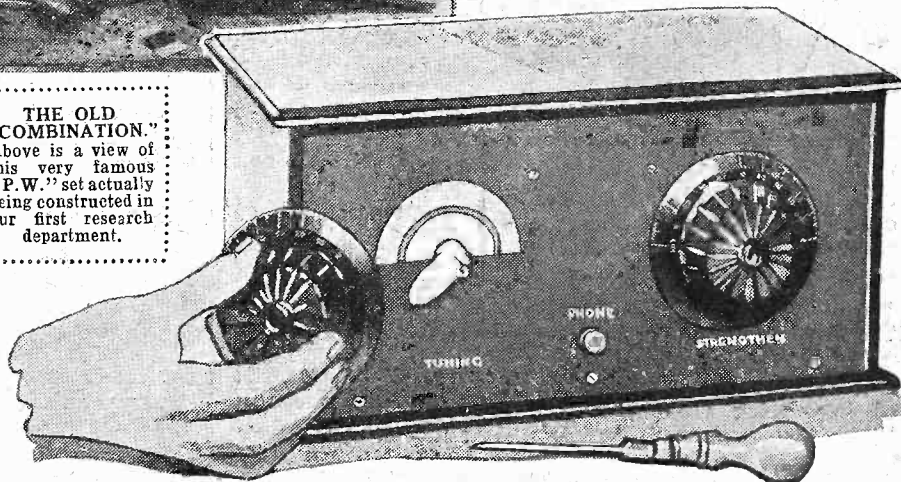
## Past and Present.

We don't shed maudlin tears for the "dear old days," and on this, the occasion of the completion of our first decade, we do not intend to ask readers to join with us in a profitless display of flag-wagging on account of our past successes.

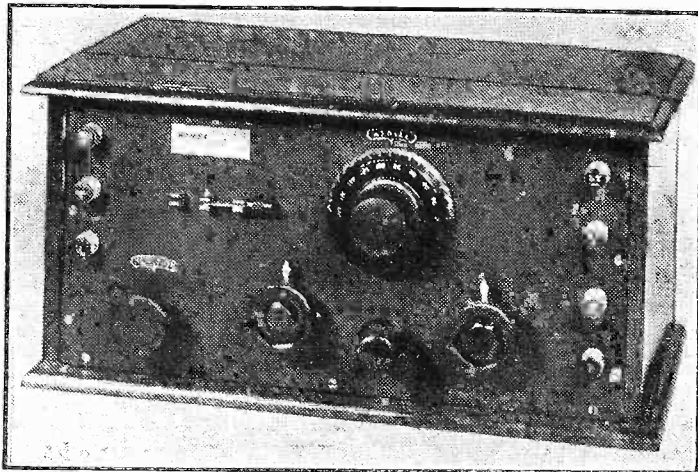
They would probably be bored inasmuch as they obviously purchase (Continued on next page.)

## AN EARLY "EXTENSER"

"P.W." gave the lead for simpler tuning with the "Simplicimus" Three (below), in which an early form of the Extenser appeared. If you compare this eight-year-old set with contemporary design you cannot but be amazed at its comparative simplicity.



## NO H.T. WAS NEEDED!



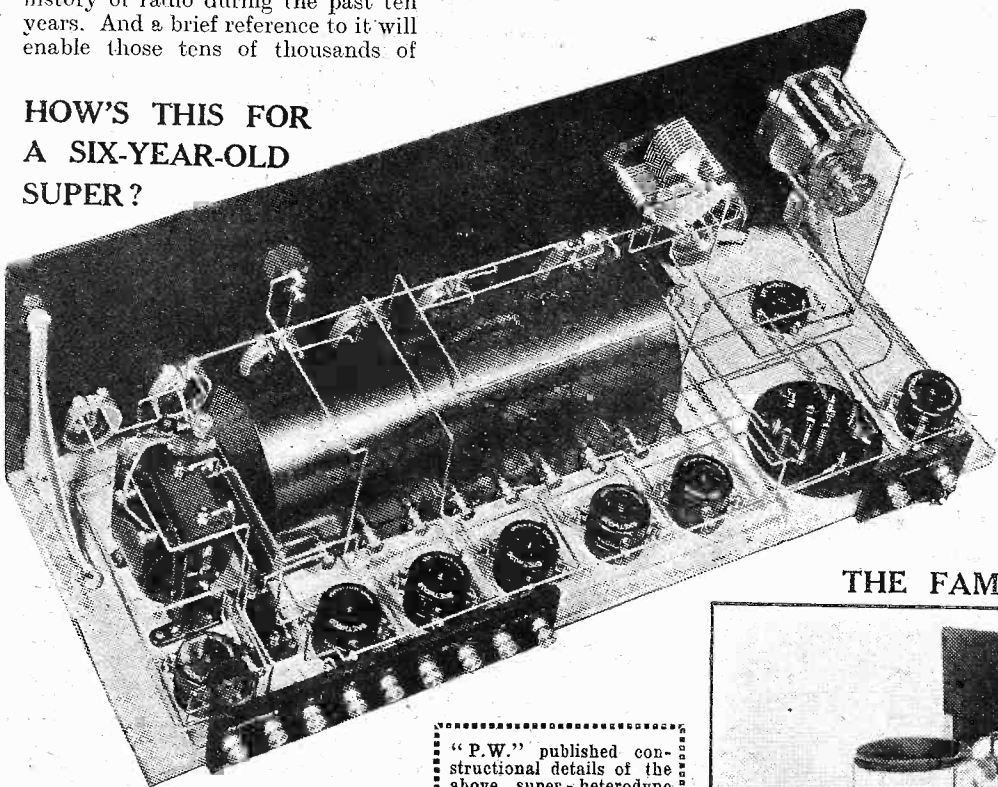
The "Unidyne"—a "P.W." set which gave full loudspeaker results without H.T., and which created world-wide interest in 1924. Marconi took one of these sets on his yacht "Eletra" in order to give it a thorough test, and then reported most favourably on it.

"P.W." to read all about the latest broadcasting developments, the newest departures in receiver technique, and how to get the most out of the sets they possess.

Nevertheless, it is an indisputable fact that the history of "P.W." must to a considerable extent mirror the history of radio during the past ten years. And a brief reference to it will enable those tens of thousands of

struction technique at its very best. Now, don't turn the pages and study the photos of this set before you have read these historically introductory notes, for the "Decade" has the duty of provid-

## HOW'S THIS FOR A SIX-YEAR-OLD SUPER?



readers who enrolled in the "P.W." army in later years to appreciate something of the extraordinary progress that makes possible the modern, inexpensive, trouble-free, and easy-to-build set.

### The Non-Stop Serial.

Indeed, this survey of the past is being given with the primary object of introducing the "Decade," a "P.W." receiver specially designed to epitomise present-day home-con-

"P.W." published constructional details of the above super-heterodyne receiver in 1926. On the right you see the very first "P.W." "Filadyne" receiver. This set introduced an entirely new principle of thermionic valve operation—the electron flow being controlled by the incoming energy at the filament itself instead of by means of the grid. The principle, which was very successful, may yet be revived for use with modern valves.

ing a climax to the first ten-year chapter of the story of "P.W."—a story which may, and probably will, continue as a non-stop serial through the centuries.

### Some Set!

Number One of POPULAR WIRELESS contained the constructional details of a "35/- Crystal Set." This was the match which set fire to thousands of home-construction beacons all over the country. We introduced it as a "rag-and-bone" receiver, not apologetically, but with the deliberate object of drawing attention to its exceptional simplicity and cheapness.

Anybody could make it and anybody could work it and receive telephony on it. It provided tangible

proof that radio was waiting on the doorstep of every home.

And, as we have said, it had the outstanding attraction that it was cheap. Yes, cheap! The word deserves repetition. (Six months later, when daily broadcasting had begun, after many alarms and excursions, an advertisement appeared in "P.W." "Mass Production Prices: Two-Valve Set, £15; Three-Valve Set, £25; Four-Valve Set, £35.")

In the third number of "P.W." we published an article entitled "Making a Simple Valve Set," and in it the following passage occurred: "It is advisable to purchase a variable condenser ready made. A good reliable instrument of a suitable capacity would cost between £1 16s. and £4 10s." (How much does a modern -0005 cost? About 6s.?)

A complete set of parts for making a -0005-mfd. variable condenser was listed at 18s. But we forget; there are no doubt many who are unaware that nearly all constructors assembled their variable condensers from sheaves of loose vanes and dozens of finicking spacers and nuts in those early days!

### The Good Old Combination.

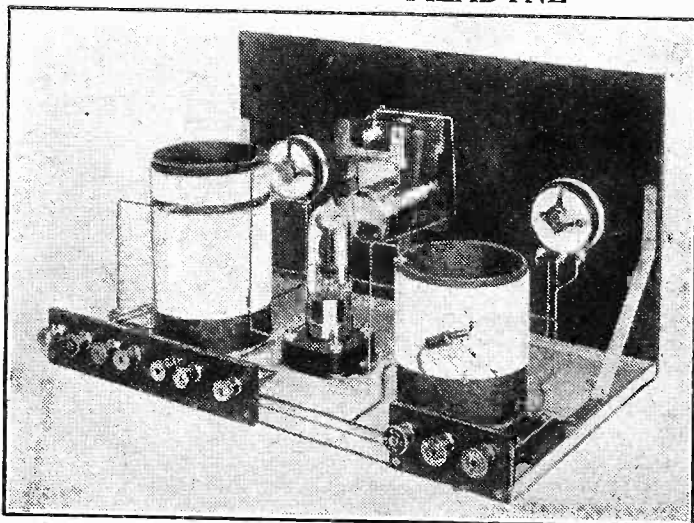
The vast majority of listeners employed crystal sets, and loudspeakers were indeed a rarity. But then valves were listed at 17s. 6d. each, and their lives were precarious to the extreme. And they would each take more L.T. current than seven or eight modern ones together. As much as 3 amperes L.T. would be required for a four-valve set in 1922.

It was in 1923 that the famous "P.W." Combination Set made its appearance, and it went over with a real bang. Again "P.W." achieved a success through paying primary attention to the economics of radio.

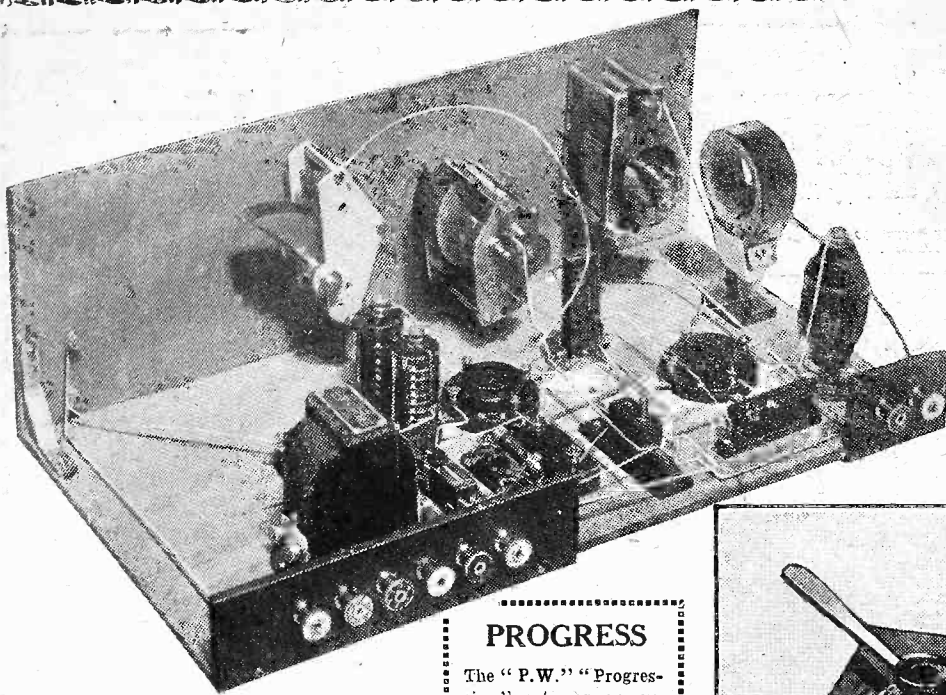
The "Old Combination," as it soon became affectionately termed by constructors, embodied a reflex circuit. There was a crystal detector and a valve which was made to act as

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## THE FAMOUS "FILADYNE"



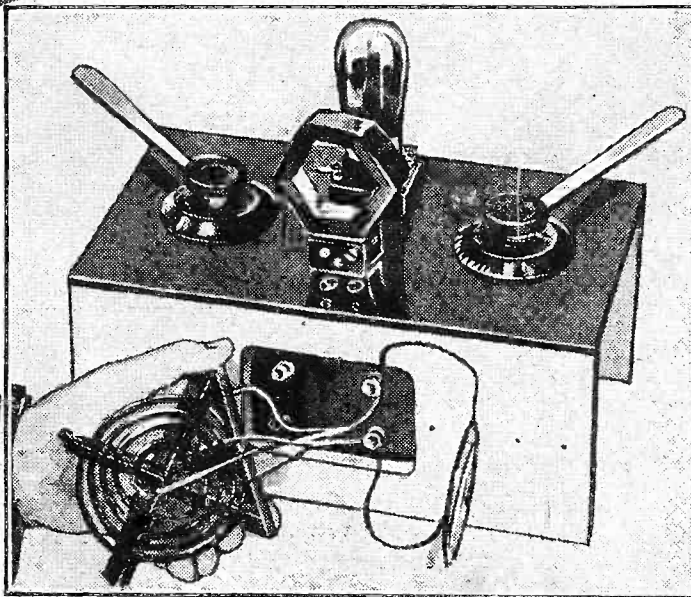




both an H.F. and an L.F. amplifier. Moreover, by means of switches the valve could be cut out of circuit and the set used as a crystal receiver. And remembering how much L.T. current the very precious and delicate "bright emitter" valve of 1922 took,

### PROGRESS

The "P.W." "Progressive" set was an extremely popular design. It appeared in 1926, and the ideas it initiated are still to be found in modern "P.W." productions.



### THE "ANTIPODES" ADAPTOR

THIS WAS THE FATHER OF ALL THE SHORT-WAVE ADAPTORS AND UNITS. "P.W." IS VERY PROUD OF THE FACT THAT THIS IDEA HAS BEEN EXPLOITED IN EVERY COUNTRY IN THE WORLD, AND THAT IT IS NOT ONLY STILL GOING STRONG, BUT IT IS EVEN TO-DAY EXPANDING ENORMOUSLY.

### TWO OTHER STRIKING SUCCESSES

Above is the "P.W." "Titan," the set which popularised the S.G. valve, while on the right is the terrifically popular "P.W." "Magic" Three, which brought short-waves within the scope of the ordinary amateur, and which introduced differential reaction.

it is easy to visualise the extremely attractive nature of that double-duty operation and of the switching in the eyes of all contemporary radio enthusiasts.

#### Loud Cheers !

Some time later we held a meeting in a large hall in London at which the original model of the "P.W." "Combination" set was introduced to an audience of some thousands.

The cheers which were given when a "P.W." technician entered bearing the instrument on a plush-covered

tray were deafening in their unreserved sincerity !

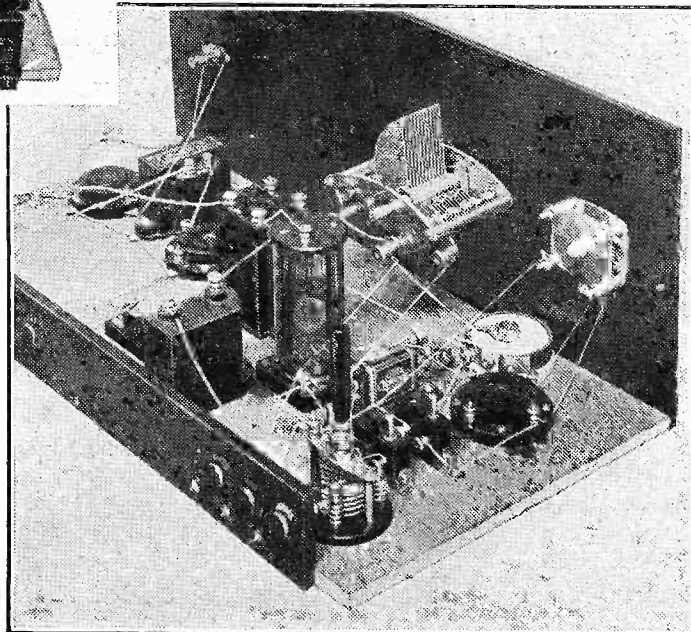
Great progress was made during 1923 and 1924, and it was during that period that the "P.W." "Ultra" sets were described. These deserve a place in this review because they initiated the tapped plug-in coil which has since been employed by the million. It is curi-

ous, but historically accurate, that until we showed the way no one had thought of "tapping" plug-in coils !

#### The "P.W." "Unidyne."

And then, in 1924, the "P.W." "Unidyne" ! The circuit which would work and work well without H.T. What a furore the "Unidyne" caused. And how we enjoyed the controversy it created. The "leader of the opposition" was at first no less a personage than Marconi himself. But he had been ill-advised by his technical assistants, as he—great sportsman that he was and always has been—afterwards publicly admitted.

(Continued on next page.)



So he took a two-valve "Unidyne" set with him on a personal cruise on his research ship "Elettra," and when he returned he gave an account of his tests which for ever silenced the more active of our critics. After all, when Sir Oliver Lodge and Marconi had both given favourable "Unidyne" reports there

and short-wave reception. But, above all, it proved beyond dispute that short-waves could be enjoyed by the ordinary man, and were not the cloistered preserves of only a highly-skilled few.

Around about the same time, the "P.W." "Antipodes" Adaptor appeared, the very first short-wave adaptor in the

world. It was predestined to be a success because of its utter simplicity and inexpensiveness — these two qualities were always "P.W.'s" guiding principles.

And the fact that the "P.W." "Antipodes" Adaptor rendered it possible to transform any ordinary set into an efficient short-waver capable of receiving programmes from the far corners of the earth, created a great impression and was indeed regarded by many as something

"P.W." sets of the past twelve months speak for themselves.

#### Enter the "Moderator."

(1) The "Pop-Vox"—in which the Extenser was a leading feature; (2) The "Super-Quad"—the first four-valve super-het using a bi-grid oscillator; (3) The "Eckersley" sets employing a new system of coupled tuning circuits invented by "P.W.'s" Radio Consultant-in-Chief; and, lastly, (4) the "Cosmic"—the first set to put three wave-bands (and the whole world of broadcasting!) on to one dial without coil-changing or switching between medium and long waves, and with only a simple transformation switch for short-waves, and the first set to employ the simple but vitally effective "P.W." "Moderator."

"P.W." started its history with a 35/- Crystal Set; what, after ten years of adventurous consolidation and with the vast resources of the modern industry and its mass-production of standardised, perfected products to aid us, are we now able to offer the home-constructor?

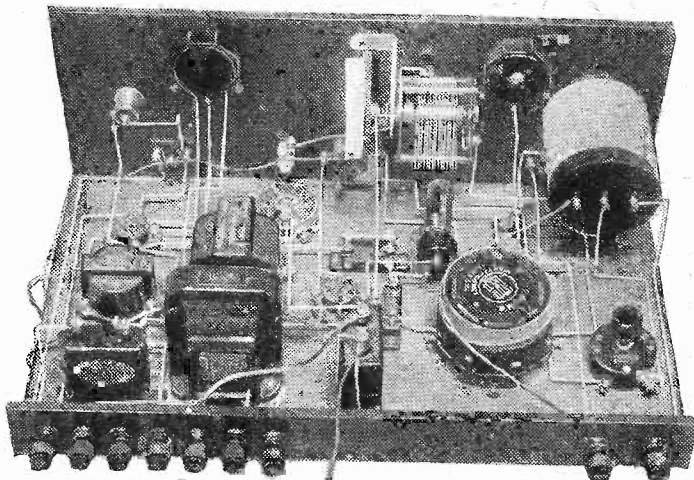
We can and shall give him an all-mains radio-gramophone, able to command ten times the number of programmes provided by a 1922 three-valve set, which cost nearly twice as much to build and which was five times as tricky and expensive to operate.

#### Keystones of Success.

But such a set could find no place in a tenth anniversary number of "P.W."—the journal with the largest radio circulation in the world. So, after considerable thought, we have produced the "Decade" Set as the symbol of progress in home-radio.

Simplicity and inexpensiveness are the keystones of its make-up: it is a set for the million. And in it you find the "Moderator," the latest and most popular of all "P.W." innovations.

### ENTER THE "COMET"



A combination of unique "P.W." features appeared in the "Comet." These were the "P.W." Dual-Range Coil, which later was to sell and be home-constructed by the hundred thousand; "Flexicoupling," a forerunner of the "Moderator"; and an up-to-date application of the "P.W." Progressive principle.

was nothing more to be said about it, was there?

The "Unidyne" enjoyed quite a run, but it was killed by the dull-emitter valve, for it would work with full power only with the "bright emitter" types. Nevertheless, it left its stamp on radio in the shape of the five-pin valve, for "Unidyne" valves were the first to have five pins. Also the "Unidyne" valve was the first widely-sold bi-grid, and for that reason it is not exaggerating to say that it directly paved the way for the S.G. and Pentode.

#### Progressive Designs.

In case there are readers who may imagine that the "super-het" is a modern innovation, it may be as well to mention that the "P.W." "Super-Het." made its bow in 1926. It was not the first "P.W." super-het. circuit, but it is notable on account of the fact that it employed a special "super" unit which made it as easy to build as any that have followed it, though it was not particularly simple to operate as compared with a modern set.

For one thing, there was a whole row of filament rheostats; nearly all sets in those days had to have separate resistances for each of their valves in order to control the L.T. current!

Also in 1926 there was the "P.W." "Progressive" Set, which initiated the "Progressive" principle, which has so successfully been applied to many subsequent designs.

And so on to the "P.W." "Magic" Set, which is still remembered, and still used by a great army of constructors. The "Magic" was a vital stepping stone in the progress of home-radio technique, in that it popularised differential reaction

approaching miraculous.

Since then millions of short-wave adaptors have been made, and they are to be seen in every country—and they are still making new friends to this very day. Indeed, it is probable that they are more popular than ever, and that their popularity will even further extend.

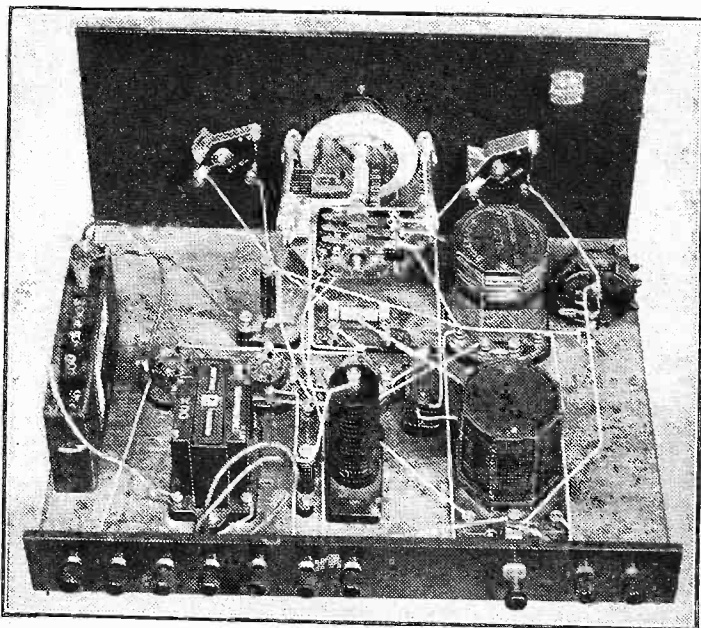
#### "Titan" and "Comet."

We now jump two years and arrive at the "Titan," the set which indicated that the day of neutralisation was drawing to a close, and that the Screened Grid Valve would henceforth command the H.F. stage.

Twelve months later the "P.W." "Comet" swept across the country and consolidated the "P.W." "Progressive" principle. Also the "Comet" introduced "Flexicoupling," the direct predecessor of the "Moderator," of which more anon.

And what of the tenth year of "P.W.," the final section of the decade? Is there a slowing down? Well, let the

### AND, FINALLY, THE "COSMIC"



Our historical review ends with the "Cosmic," a set with which astounding reception records have been created (one reader received 257 stations on the loudspeaker with it). It can tune-in short, long and medium waves on the one dial without coil-changing.





**A COMPACT, POWERFUL  
AND INEXPENSIVE LOUDSPEAKER  
RECEIVER WHICH REPRESENTS THE  
LAST WORD IN SIMPLIFIED EFFECTIVENESS**

THE appearance of this set, its freedom from either internal or external complication, may lead many to think that it is "just another of those three-valve hook-ups."

Actually, of course, you cannot gauge the potentialities of a radio receiver by the absence or otherwise of intricacy in its construction.

On the other hand, simplicity is a quality that is strenuously worked for by all set designers, and the extent of their individual success can largely be measured by the degree to which they attain that end.

#### A Real Triumph.

And in this connection we believe the "Decade" is a real triumph, in that it possesses power and selectivity well above any ordinary receiver of such straightforward assembly.

The secret of its superiority is mainly to be found in the Moderator scheme which is included. The Moderator enables the user of the set to make his own compromises between selectivity and sensitivity, and he can do this quickly and with full success, even though he has had no previous experience of set handling.

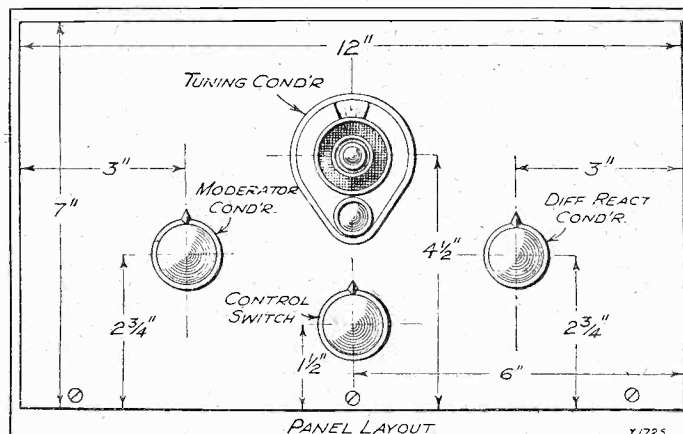
In the average radio set considerable aerial energy is thrown away in order to obtain a "set" degree of selectivity of such proportions as are likely to meet the needs of all listeners, wherever they may be situated.

#### "Break-Through" Silenced.

Which means that all have to suffer power loss for the sake of the minority who are badly placed in regard to local conditions.

But the Moderator control on the "Decade" does not only give you a power-selectivity control on medium waves, but it also operates

#### EXTREMELY FLEXIBLE CONTROL



Despite the small number of controls, this set possesses a greater flexibility than any ordinary design, and can at once be adapted to any local conditions.

as a silencer of "break-through" on the long waves, in conjunction with a special long-wave selectivity adjustment.

And now, what is the "Decade" capable of doing in the way of programme collecting?

Well, first of all, it should be mentioned that the answer to this question depends to a great extent on the aerial used and the geographical position.

But, given a good indoor aerial or a moderate outdoor aerial, "logs" up to fifty stations at good loudspeaker strength ought to be well within the bounds of probability.

Anyway, all "Decade" builders will get full volume loudspeaker results from a number of stations, and we will go so far as to say that there is no other receiver with similarly inexpensive and simple qualities capable of extending it.

Also, it should be mentioned that stability and purity are two further qualities which accompany the considerable volume obtainable with the "Decade."

The "Decade" is, in short, the set for the million.

#### No Soldering.

As we have said before, its construction is superbly free from complexity, and we cannot see how any constructor can go wrong, providing he carefully follows the diagrams.

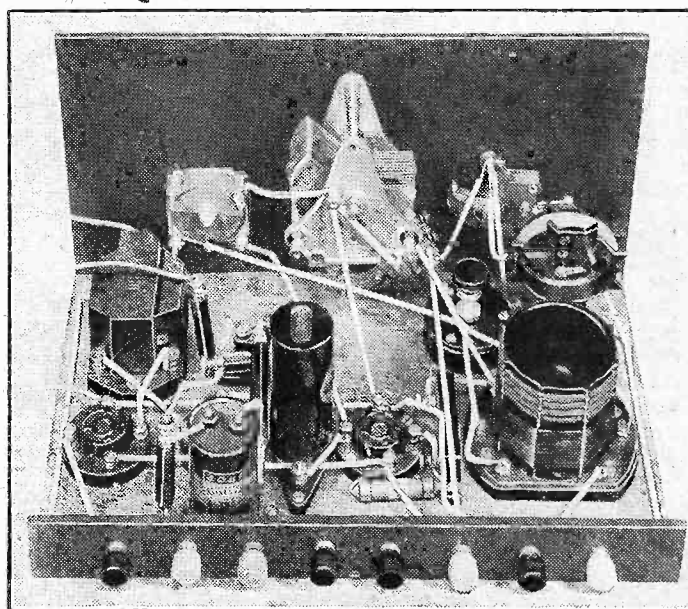
Even the switch presents no difficulties, for it has terminals. Indeed, there is no soldering to be done anywhere in the set.

It should be noted that the position of the Moderator coil is an important point in the assembly. It couples with the dual-range coil, and in order that the coupling should be fairly strong, it is advisable to raise the Moderator coil on a small block of wood 1 1/8 inches in height.

We will have more to say about this next week, for by altering the position of the Moderator coil it is possible to overcome the disabilities attending extremely bad local conditions.

(Cont'd on next page.)

#### UNEQUALLED POWER AND PURITY

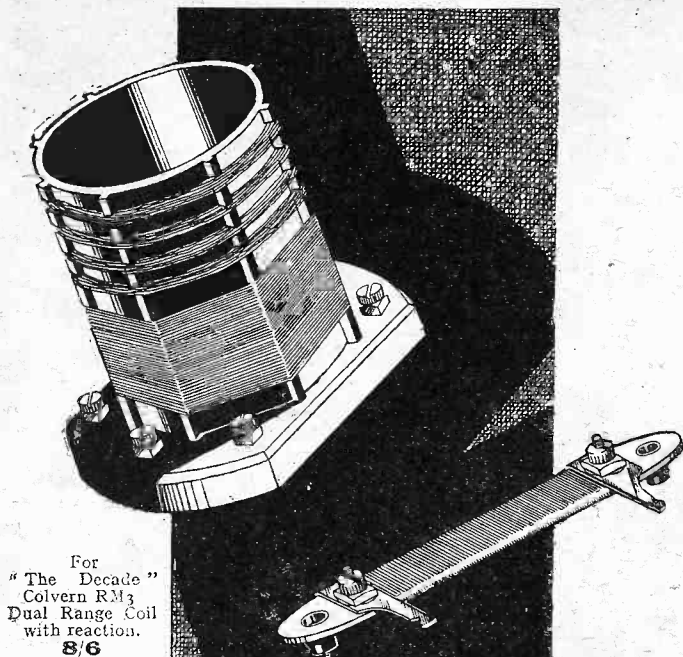


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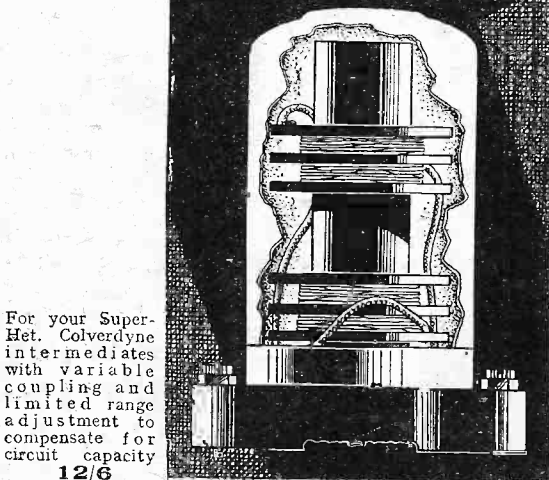




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Dx 66

# SHORT-WAVE NOTES

By W. L. S.

There seems to be so much interest in the short waves now—despite the dull conditions—that extra space has been allotted this week to our popular contributor for his survey of this fascinating branch of radio reception.

CONDITIONS undoubtedly are remaining on a very poor level this year for reception of anything but the more powerful broadcast stations. Real long-distance work by the "hams" has come to a stop since the series of tests during February and March, and has been replaced by a period of expectant waiting!

But there is no reason to worry; spells of bad conditions can be surmounted by the use of better transmitters and receivers, and from what I know of the short-wave man he never says "die"!

I was reading an article recently on the rather tender subject of our weather. The author put forward the novel point of view that we should regard the natural state of our climate as *rain*, and that anything more pleasant should be looked on as a heaven-sent and unexpected blessing.

## Don't be a Pessimist!

If folk would only dress the part, he argued, rain need not be unpleasant, and we should appreciate what little fine weather we do get a hundred times more.

Surely this doctrine can be applied to short-wave radio? The conditions existing just now must be looked upon, not as bad, but as *normal*. A slight improvement will make them positively good, and a real improvement excellent. So let us get down to the job of improving our receivers right away.

Readers of "P.W." certainly don't seem to be of a pessimistic tendency, for I still receive stacks of letters from old hands, medium hands and raw novices. All are full of enthusiasm, and the only general complaint is that the bite of the "short-wave bug" is particularly venomous just now. The effects are acute and last for a very long time.

I. B. (Lincoln) has just succumbed to it, and appears to like it. He finds W 2 X A D and W 8 X K very good, like most of us. W 8 X K, by the way, on his 19.72-metre wave, usually announces in frequency only—15,210 kc.

## The Twenty-Metre Yanks.

W 2 X A D's wave and frequency are 19.56 metres and 15,340 kc. Both stations, as I predicted in the face of strong opposition, come over very well until midnight.

Radio Roma's new setting on 42.9 metres appears to be very successful, but he has badly shaken the amateurs on their 41.2-42.8-metre band. Representations on behalf of the amateurs have been made to him by more than one government, as a result of which we shall probably notice a slight shift before long. He is also active again on 25.4, which may mean that 42.9 metres will be quiet by the time these notes appear.

A. L. M. (Bristol) reports an excellent and unusual bit of reception. On 49.43

metres he logged V E 9 C S (Vancouver, British Columbia) between 6.45 and 7.45 p.m. Signals were rather weak, but he followed the musical programme and talks for the full hour.

This seems a fine performance to me, for I know how difficult it is to find anything from the west coast of the United States, and Canada is a harder proposition still. Congrats to A. L. M. Who will follow him up? The station is, of course, just above U O R 2 (Vienna).



THE HAT TRICK!

Motor bandits will not approve of this new portable receiver which may be issued to London policemen. By means of a tiny set and cone speaker in the helmet, and a pocket battery, Scotland Yard could keep in touch with any officer on duty.

Two more readers qualify for "H.A.C." in the persons of W. J. C. (Maidenhead) and E. S. W. (N. Finchley). The ranks are swelling fast, and we shall have to arrange a grand meeting of members "on the air" one of these days.

It is strange how this "single-valve" business grows on one. I am nearly snowed under by letters in praise of my own "one," which was surely the most ordinary and un-original short-wave set ever made! Readers really are beginning to find out for themselves that a quiet background is more useful than much fine noise.

One of the single-valve enthusiasts, W. T. (Hastings), reports a newcomer in the shape of W A J, on 13,480 kc. (about 22.26 metres). This must be the station that

mystified me a few evenings ago. He is just above the 20-metre amateur band, and comes over at tremendous strength, but his programme time is irregular.

Those who are still inquiring about the Radio Amateur Call-Book, and "How to Become a Radio Amateur," should note that these publications can be obtained from Mr. F. T. Carter, Flat A, Gleneagle Mansions, Streatham, S.W., or from the R.S.G.B. Headquarters. The Call Book is published quarterly, and contains lists of short-wave stations, apart from the amateurs.

## A Difficult Question.

G. S. (Halifax) wants me to tell him his tuning range, given the facts that W 3 X A L, Moscow ("Solanka"), and an Amsterdam station on 80 metres arrive near the top of his dial. At a very rough guess, G. S., I should say that you might be getting down to 32 metres or so, but unless you can give me more details I'm afraid the answer can't be much more than the proverbial lemon.

I mention this because it is a terribly difficult matter for me to try to put readers straight in this way without knowing the most intimate details about the set. The only thing to do is to find your own way about by logging everything you hear and comparing it with one of the published lists of short-wave stations.

Alf Mann (Middlesboro'), who is Ariel's particular friend-in-the-ether, writes me a nice long letter condemning "swank" by readers, and suggesting that they would be better employed identifying new stations and helping on those who aren't so clever! I quite agree with him!

## Who Wants One?

He also wants a short-wave heterodyne wavemeter, since his own first attempt behaved "like Old Man River, and didn't say nothin'!" We will look into this. As a matter of fact, I know that I promised to describe one many months ago, but the demand appeared to be so small that I let the matter drop.

After all, a heterodyne wavemeter is simply another one-valve receiver, slightly modified and calibrated. Meanwhile, A. M. suggests that anyone in need of a job should try and identify all that he hears between 45 and 50 metres one evening. Right, A. M.! I'll do it myself.

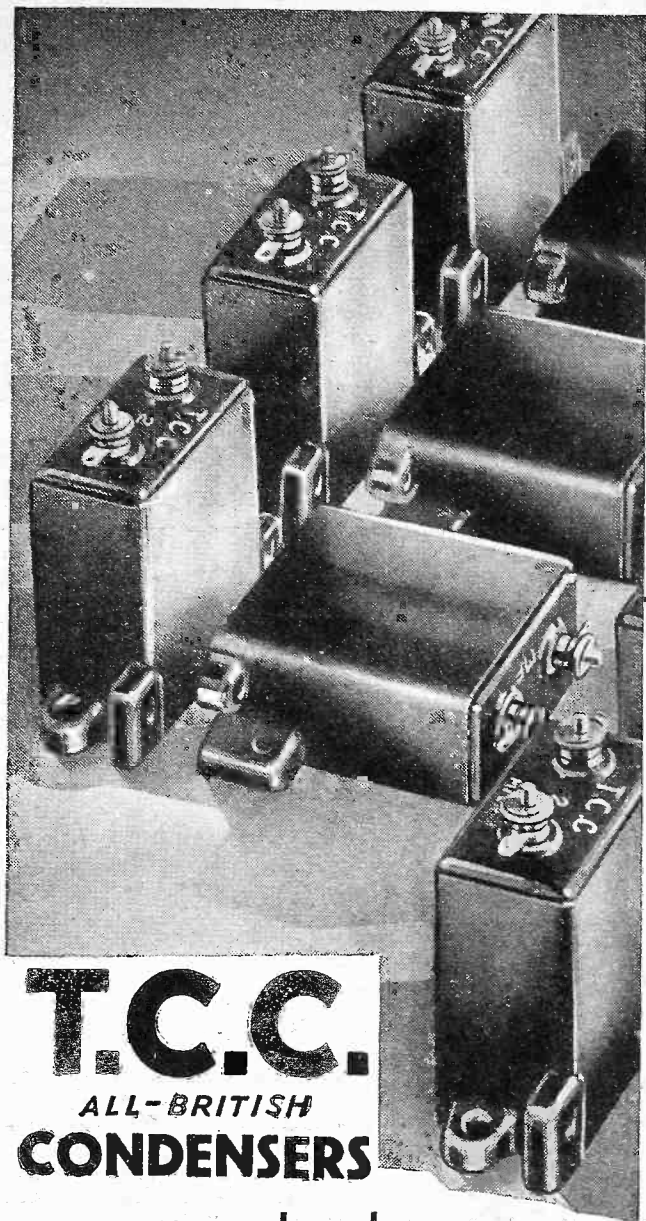
Will readers please note that I cannot possibly undertake to act as an information bureau to the extent of identifying long lists of transmissions? The Call-Book does this for one very efficiently, and, much as I should love to write to every reader personally, the pile of letters usually confronting me makes such a proceeding quite impossible. Thank you!

## For The Early "Birds"!

In concluding, I might mention that a short spell of fine, sunny weather may possibly have a beneficial effect on DX reception. I have always found that at this time of year fine weather goes with good conditions, particularly in the early mornings.

By the time you read this there is a chance that the period from 06.00 to 08.00 B.S.T. will be quite lively, even if the rest of the day is dead. One or two separate mornings have shown distinct promise already, and "freak" evenings for American broadcast are fairly frequent.





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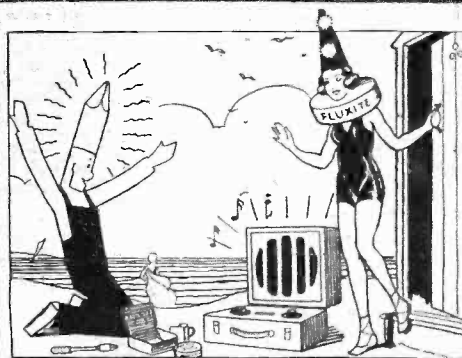
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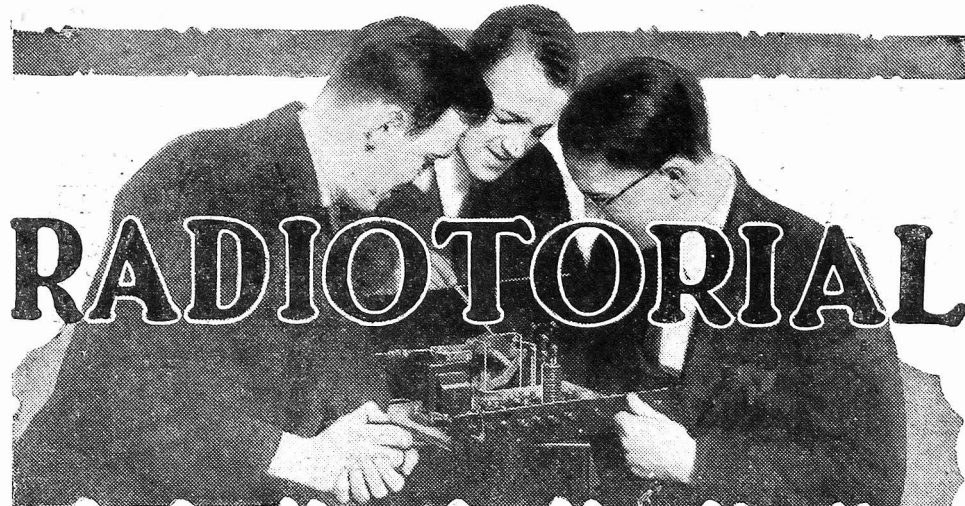
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# RADIOTORIAL

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The Editor will be pleased to consider articles and photographs dealing with all subjects appertaining to wireless work. The Editor cannot accept responsibility for manuscripts or photos. Every care will be taken to return MSS. not accepted for publication. A stamped and addressed envelope must be sent with every article. All inquiries concerning advertising rates, etc., to be addressed to the Sole Agents, Messrs. John H. Lilc, Ltd., 4, Ludgate Circus, London, E.C.4.

The constructional articles which appear from time to time in this journal are the outcome of research and experimental work carried out with a view to improving the technique of wireless reception. As much of the information given in the columns of this paper concerns the most recent developments in the radio world, some of the arrangements and specialities described may be the subjects of Letters Patent, and the amateur and the trader would be well advised to obtain permission of the patentees to use the patents before doing so.

## QUESTIONS AND ANSWERS

### WAVE-CHANGE SWITCH WIRING FOR THE "COSMIC" THREE.

"REGULAR 'P.W.' READER" (Cleekheaton).—"Can you explain how to wire the 'Cosmic' Three with a change-over switch, to use ordinary '0005 tuning condenser instead of Extenser? I know a few friends around here at Cleekheaton who would build it if they could use their old condensers."

An ordinary '0005 mfd. tuning condenser can be used in place of the Extenser if a wave-change switch of the correct pattern is used in conjunction with the tuning condenser.

The pattern of switch in question is one commonly known as a "three-spring" switch. But sometimes it is known by other names, and on the other hand, a number of "wave-change" switches are useless for the purpose.

To make sure of getting the right kind of switch, all you have to do is to notice the action. What you

need is a switch which has four leads going to it, and in one position—which we will call the "off" position—all these leads are separated from one another.

But when the switch is changed over to the "on" position all the four leads are in contact with each other. You can soon tell if you examine the switch carefully whether it fulfils these conditions, viz., one position all contacts together, other position all contacts separate.

Now to connect up. It is very easy indeed.

First you will need to mount the switch near where it is to be used. Remember the word near—the very long, straggly leads sometimes used are very inefficient.

A good place would be directly under the Moderator condenser. Or if it is a new panel you are drilling and you wish it to look balanced, you can move the on-off push-pull switch over to the right a couple of inches (looking at the front of the panel) and then put the wave-change switch over two inches to the left of the centre, to match.

The actual connections are: One contact on switch to moving vanes terminal of the tuning condenser. (The "fixed" terminal of this (P.), and also the other, "moving" terminal (M.) connections are just the same as in the blue print.)

A second contact on the switch goes to moving vanes of the Moderator condenser and to 1 on the dual-range coil.

The third switch contact (it does not matter which one you call the third, so long as it is one of those remaining unoccupied) goes to No. 2 on the dual-range coil.

If you have proceeded right you will now have one empty terminal or connecting point on the switch and this goes to the bottom terminal of the Moderator coil. That completes the alteration.

It should be noted that when an ordinary "three-spring" switch is employed, the fourth contact is provided by a flex lead connected to the plunger of the switch, the other three contacts coming one from each spring.

### AERIALS NEAR THE PIGEON-LOFT.

A Manchester reader raises an interesting question in connection with pigeon fanciers and radio. He tells of the loss of valuable birds through flying into wires which they cannot see, and asks what can be done to protect the birds from this danger.

We must confess to some considerable surprise at this question being raised again, as there is a very simple and effective remedy which costs nothing. And we thought that all pigeon fanciers knew of it, as considerable prominence was given to it in their own as well as in wireless journals when the rapid increase of aerials some years ago shed light on the distressing frequency with which the birds could be damaged by flying into wires.

The remedy is simply to make the wires clearly visible by putting corks along at intervals. Just as they do on telegraph wires near game preserves.

The corks make no difference at all to reception, but the birds see them easily and

will always avoid a wire so treated. So any set owner whose aerial is near a pigeon-loft should—even if not asked to by the pigeon owner—slip a few corks on the wire at intervals of 4 or 5 ft. before it is put up, or when it is down for overhaul.

And should it happen that the man who keeps the pigeons is an objectionable sort of person, who, deserves all that's coming to him—well, put the corks on, just the same. Because it's the pigeons that fly into the wire and get hurt, and nobody wants to be party to injuring them, even if their owner isn't a particularly agreeable soul.

It is not necessary, of course, to thread the corks on. Drill a hole through their centre, and then cut through to it on one "side". The corks can then be sprung on.

### WHAT IS A MILLIAMP?

L. J. A. (Berwick).—"Trying to work out a little calculation of voltage drop has reminded me that my schooldays are a long way back. And I do not know how I shall do it

### HOW ARE YOUR RESULTS NOW?

Perhaps your switching doesn't work properly? Or some mysterious noise has appeared and is spoiling your radio reception? Or one of the batteries seems to run down much faster than formerly?

Whatever your radio problem may be, remember that the Technical Query Department is thoroughly equipped to assist our readers, and offers its unrivalled service.

Full details, including scales of charges, can be obtained direct from the Technical Query Dept., POPULAR WIRELESS, The Fleetway House, Farringdon Street, London, E.C.4.

A postcard will do. On receipt of this an Application Form will be sent to you post free immediately. This application will place you under no obligation whatever, but, having the form, you will know exactly what information we require to have before us in order to solve your problems.

**LONDON READERS, PLEASE NOTE:** Inquiries should NOT be made by phone or in person at Fleetway House or Tallis House.

after all unless you explain to me the decimal point position which is equal to 1 milliamp.

"Is it .01 or .001 ampere?"

"Milli" means one-thousandth, so 1 milliamp is 1/1000 amp., or expressed as a decimal, .001 amp.

Just as a reminder we show below the value in fractions and in decimals of other commonly used quantities, namely .5 m/a, 2.5 m/a, 10 m/a, 50 m/a and 100 m/a.:

	0.5	
.5 milliamps =	$\frac{0.5}{1000}$	amps. = .0005 amp.
	2.5	
2.5 " =	$\frac{2.5}{1000}$	" = .0025 amp.
	10	
10 " =	$\frac{10}{1000}$	" = .01 amp.
	50	
50 " =	$\frac{50}{1000}$	" = .05 amp.
	100	
100 " =	$\frac{100}{1000}$	" = .1 amp.

These examples will serve to remind you that the first figure after the decimal point represents tenths, the second figure hundredths, the third figure thousandths, and so on.

### THE "S.Q. STAR."

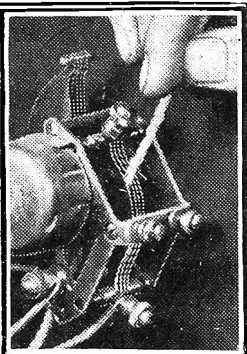
T. W. (Colchester).—"I am very taken with the 'S.Q. Star' in 'P.W.' Christmas Number, but I see there was an article preceding the description of the set that I should like to read also. What week was that, and where can I get the back issue?"

The article was in "P.W." No. 495, dated November 28th, 1931.

Back numbers of "P.W." which are still in print can be obtained direct from the publishers in cases of difficulty. The address is The Amalgamated Press, Ltd., Back No. Dept., Bear Alley, Farringdon Street, London, E.C.4. The price is 4d. per copy of "P.W." post free.

(Continued on page 388.)

### IS IT THE VARIABLE CONDENSER?



Modern variable condensers are thoroughly sound jobs, but they have their little ailments sometimes.

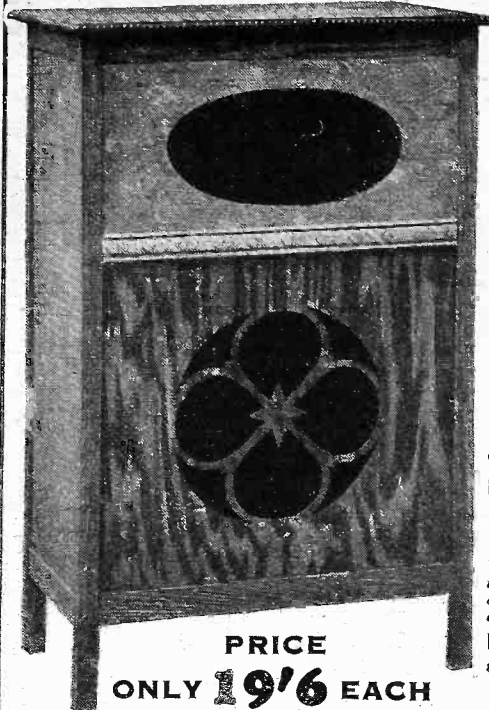
Dust between the plates, for instance, will often cause crackling noises. A pipe-cleaner is handy in such cases, but the better plan is to keep the set covered and free from dust.

And sometimes a larger fixed condenser (say a .001 mfd. fixed) will aid in cutting out reaction condenser noises, if joined in series with the variable reaction condenser (in either lead).



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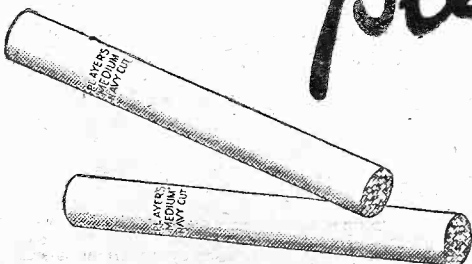


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## RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 386.)

### A LEVIATHAN OF THE WAVELENGTHS.

Referring to a query sent in by "Jason," of Croydon, about the wavelengths used by the "Leviathan," a Streatham reader kindly gives the full range of wavelengths officially allotted to this vessel, numbering 24 in all!

These are given below, and our correspondent—Mr. F. L. Carter, Flat A, Glen-eagle Mansions, Streatham, S.W.—obligingly says: "These are taken from the Berne Lists, and if your correspondent wants any more you can put him on my track."

"Leviathan's" wavelengths: 17-007, 18-007, 18-094, 22-71, 27, 27-15, 33-98, 36-01, 36-19, 54, 54-3, 71-8, 95-9, 600, 640, 705, 750, 800, 1,875, 1,885, 1,910, 1,960, 1,985, 2,100—all in metres.

### MAKING THE "COSMIC" ONE SHORT-WAVE COIL.

For the short-wave coil unit, which is wound on a Goltone standard short-wave former with six-terminal base, you will require about a yard of No. 18 gauge tinned-copper wire and a quantity of No. 30 D.S.C. (If you get an ounce reel of the latter you will

have sufficient left over for the Moderator coil as well.)

Commence the winding of the short-wave coil with two turns of the 30 D.S.C. wire, which should be positioned approximately half an inch from the top of the former. By the way, with regard to the fixing of the ends of the windings on this former, the ideal way, of course, is to drill small holes in the ribs. But bakelite mouldings are very brittle, and unless you are very careful in the drilling process the chances are that the ribs will break.

For this reason you may find it best to secure the ends simply by giving them a single twist round the appropriate rib.

The main grid winding of the short-wave coil is done with the No. 18 gauge tinned copper wire, and it consists of four turns with an eighth of an inch spacing between each turn. The start of the winding should be commenced at a distance of three-quarters of an inch from the two-turn winding already on.

The third and last winding of this former consists of five turns of the number 30 D.S.C. closely wound, and at a distance of three sixteenths of an inch from the lower end of the grid winding. All three windings should be in the same direction.

When all these windings have been done, the next thing is to connect the various ends to the appropriate terminals on the

### DO YOU KNOW—

—the answers to these questions?

There is no "catch" in them; they are just interesting points which crop up in discussions on radio topics. If you like to try and answer them you can compare your own solutions with those that appear on a following page of this number of "P.W."

(1) Why are the masts of the London Regional station at Brookmans Park only about 200 ft. high, whilst those at the North Regional and Falkirk are 500 ft. high?

(2) What is the characteristically Australian interval signal of the Sydney short-wave station, VK2ME, which works on 31.28 metres?

(3) Which station is Europe's most powerful transmitter on the medium waveband?

(4) In what order the electrodes inside a screened-grid valve are arranged?

(5) The wavelengths of the Pope's transmitting station, "Vatican City"?

The answers are given on page 390.

### "P.W." PANEL No. 74. ABOUT THE VALVE.—D.C. RESISTANCE.

When a valve's filament is heated and a voltage is applied between this point and its anode, a current flows from filament to anode inside the valve.

The higher the applied anode voltage the greater the current (within limits), so the valve can be considered as having a resistance equal to the steady voltage applied divided by the current.

This is known as the valve's "D.C. Resistance." (It is *not* the "impedance.") For instance, a valve which passes one milliamp (.001 amp.) at 100 volts has a D.C. Resistance of  $\frac{100}{.001} = 100,000$  ohms.

coil base, and for this purpose you cannot do better than to refer to the accompanying diagram, in which the correct procedure is shown.

It would perhaps be as well for us to tell you how this particular short-wave unit should

(Continued on page 390.)

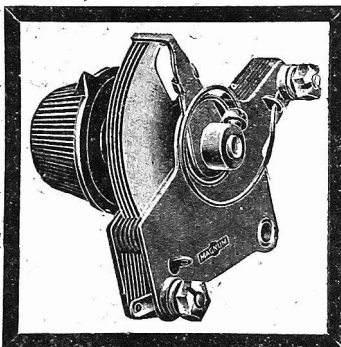
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Let them tell you what modern valves would suit your set or show you if new or later types would improve your reception.

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Write to us for the address of your nearest Six-Sixty Valve Service Station and consult them on all your radio requirements

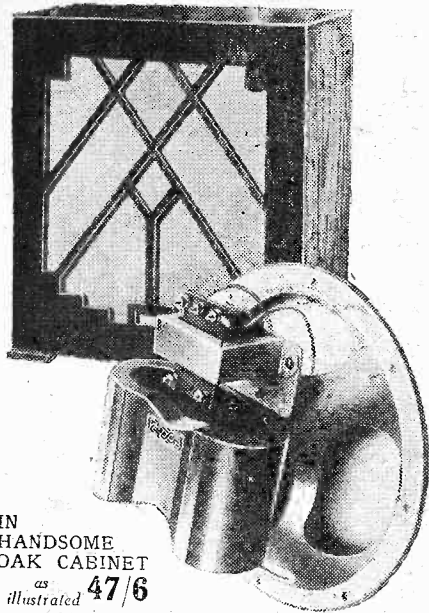




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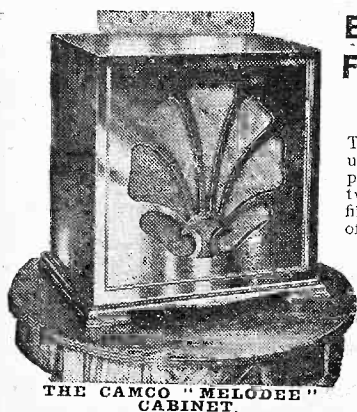
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P.W.36



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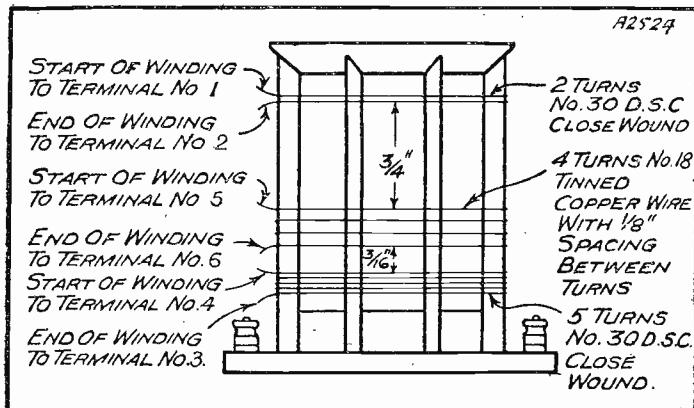
## RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 388.)

be connected up, since the terminal markings are not quite the same as those shown in the original wiring diagram.

The beginning of the 2-turn (aerial) coil (terminal 1) is joined to the set's aerial terminal. The end of this winding (terminal 2) goes to one side of the Moderator coil and to one side of the .00075 mfd., and to the plunger of the short-wave switch.

### THE "COSMIC ONE" SHORT-WAVE COIL



Here are all the necessary winding and "connecting-up" details.

The beginning of the main grid coil (terminal 5) to the .0003 grid condenser.

The end of this coil (terminal 6) to another contact of the short-wave switch and to 8 on the dual-range coil.

The beginning of the 5-turn reaction

winding (terminal 4) goes to the .0003-mfd. reaction condenser; and the end of this coil (terminal 3) to the H.F. choke and plate of the valve holder.

### MAKING A MODERATOR COIL.

In the instructions for building the "Cosmic One" last week it was stated that brief details of the construction of the Moderator coil would appear in the "Radiatorial" columns in this issue. These details are given below:

The basis of the coil unit is one of our old friends, namely a "P.W." "Coil Quoit"—such as can be obtained for a few pence at almost every radio dealer's. And the wire of which the coil itself is composed is No. 30 D.S.C., of which only a few pennyworth will be needed, as there are to be only 35 turns in the complete coil.

To make the coil, fix the wire to the former by passing it a couple of times through a small hole provided near the end of the coil quoit; and be sure to leave 8 or 10 inches of wire.

What you want to make is a 35-turn coil with tapings at the 21st and 27th turns. Assuming you have fixed your wire to the former, as mentioned, you first wind on 21 turns, neatly

and side by side. Do not break the wire at this point, but, holding it firmly in tension, twist a fairly large loop in it, to serve as a tapping point. And leaving this loop sticking out from the coil, carry on the winding, in the same direction, for another six turns.

Again do not break the wire, but make a second tapping loop, like the first. And then complete the coil by winding in the same direction another eight turns.

That makes 35 turns in all, so you finish off the coil by keeping it tightly in tension while you snip off the wire about a foot from the last turn, subsequently passing this end through the little holes in the former, and drawing tight, to fix the turns in position.

Now with a penknife, carefully scrape off the insulation from the wire at the tapping loops.

When these are bared so that a clip can easily make contact, the coil is completed and ready for mounting.

### MODERN MAINS VALVES.

In a recent reference to this subject and to full-mains-voltage valves it was inferred that the Ostar-Ganz high-voltage types were not available to the public. This is incorrect, as large stocks are held by the sole representative for Gt. Britain, Eugen Forbat, c/o Nivalight (1928) Ltd., 1, Rosebery Avenue, London, E.C.1.

### THE ANSWERS

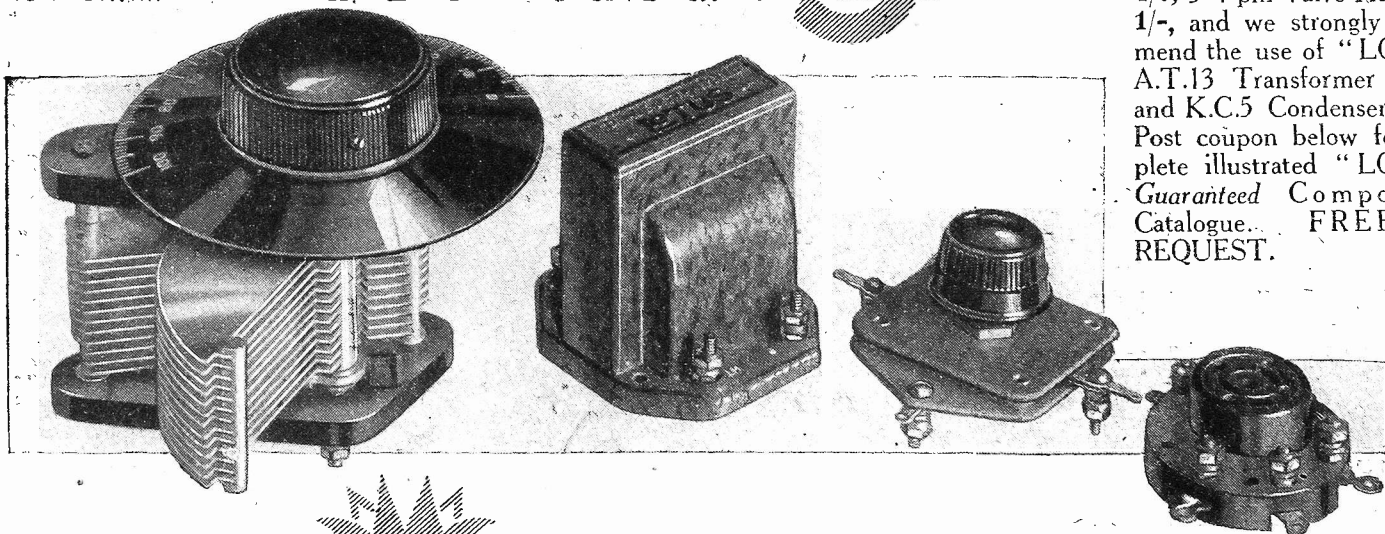
—to the questions asked on page 388 are given below.

- (1) The Air Ministry regulations do not permit of masts higher than 200 ft. in the London area, but they do not apply to the other areas.
- (2) The call of the kookaburra or "laughing jackass."
- (3) Prague, with 120 kilowatts, on 488.6 metres.
- (4) Next to the filament is the control grid, then the screening grid, then the anode.
- (5) 19.84 and 50.26 metres.

DID YOU KNOW THEM ALL?



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## TECHNICAL NOTES

Some diverse and informative jottings about interesting aspects of radio reception.

By Dr. J. H. T. ROBERTS, F. Inst. P.

### Electric Clocks.

SOME little time back I mentioned the new synchronous A.C. electric clocks which are rapidly gaining popularity, and several readers have asked me whether these clocks are suitable for various types of electric supply, whether they are difficult to operate, and various other questions as to their timekeeping qualities, and so on.

With regard to the type of electric supply, the synchronous clocks naturally only operate on alternating current—they are not intended at all for direct current—and the clocks sold in each district by the Electric Supply Company's and also by the various stores and jewellers will all be of the proper voltage and periodicity for the electric mains of the district.

### Time-keeping Capabilities.

As regards accuracy, this is absolutely the same as that of the frequency of the alternating-current supply, and as this is capable of being continually averaged up at the generating station in accordance with Greenwich time it means that the synchronous electric clock (provided it does not stop) will always keep Greenwich time. This, indeed, is the fundamental advantage of the whole scheme.

Of course, if the electric supply should fail at any time the clock will stop, and unless it is of the special self-starting type it will not restart when the current is resumed. But you are not likely to be misled by this, because when you look at the time on the clock you will at once notice if it is more than a very few minutes out.

Personally, I favour the non-self-starting type in preference to the self-starting, because if the supply fails for, say, five minutes, with the self-starting type the clock will go on and be five minutes wrong, whereas if the supply fails at all with the non-self-starting type the clock will remain stopped, and there is scarcely any likelihood of a mistake being made by the user.

Generally speaking, the self-starting type works on the synchronous induction motor principle, whilst the non-self-starting type incorporates a very simple form of tiny phonic wheel, having a fairly large number of teeth on the rotor, this rotating between the field windings excited by the alternating-current supply.

Theoretically, there is a possibility of the clock being started at twice or three times or half the normal speed, but in practice this is very unlikely to happen, and if it did happen the effect would be very quickly noticed, because, of course, the rate of movement of the hands of the clock would be multiplied or divided in the same way.

### Photo-electric Cells.

Photo-electric cells have been greatly simplified and cheapened during the past few years. Originally, of course, these

(Continued on next page.)

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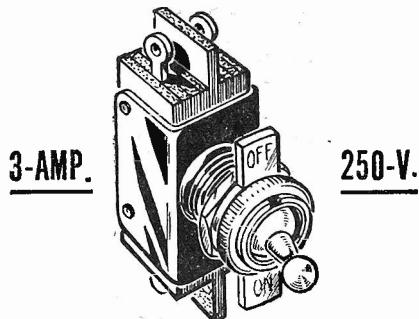
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## TECHNICAL NOTES

(Continued from previous page.)

cells were mainly used for television and talking-picture purposes, and most people had the idea that they were very "scientific" and not likely to be of much use for ordinary every-day purposes. They have been, as I say, so greatly simplified that now they can be obtained very cheaply in really robust units and used, one might almost say, with the same facility as a radio valve.

In case any of you who are new to radio may not be familiar with what is meant by a photo-electric cell, it is simply a device which is sensitive to light in such a way that the electrical output from the cell varies in accordance with the intensity or character of the light which falls on it.

Speaking broadly, the photo-electric cell may be described as a device for "converting" light energy into electrical energy. This popular description is not strictly correct, but it is sufficient for the present purpose.

### No Auxiliary Amplifier Required.

Readers have several times asked me what sort of output can be obtained from a photo-electric cell as compared with the output from a radio valve, for instance. Perhaps it may help if I tell you that a modern inexpensive unit for home use, which I have recently been examining, gives about one microampere per foot-candle of light intensity. When this unit is exposed to direct sunlight the output is about 5 milliamps.

The resistance of the cell varies from about 1,500 ohms at 10 foot-candles light intensity to about 300 ohms at 240 foot-candles intensity. The unit is enclosed in a moulded bakelite case about 2 in. diameter and is fitted with a pair of valve pins for ready connection.

This particular cell requires no polarising or exciting voltage, and it will operate the relay directly without any auxiliary amplifier.

This last is a very important point, as most of the earlier types of photo-electric cell delivered such an extremely small output that some form of auxiliary amplifier was absolutely essential.

### A Cheap Experimental Unit.

In addition to their use for talking pictures and television, photo-electric cells are now becoming increasingly used in connection with light-ray-operated devices (such as burglar-alarms and other protective devices, automatic street-lighting, and so on), the counting of various objects such as the product of a factory, the timing of objects such as motor-cars or aeroplanes in a race and a hundred-and-one other purposes.

There are several very useful photo-electric cells on the American market, and I notice that Messrs. Electradix Radio, of 218, Upper Thames Street, E.C.4, have a supply of special cells as used for cinema work which they are offering at a very low price, so that any of you who feel inclined to experiment in this direction can do so quite easily.

### Nickel-Iron Transformers.

The nickel-iron core transformers, which are so popular to-day, have been on the

(Continued on next page.)

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## TECHNICAL NOTES

(Continued from previous page.)

market long enough for us to form a good judgment of their qualities, and they are frequently referred to in letters which I receive from readers. The transformer in question is, of course, particularly designed for the parallel-fed circuit arrangement, and the inductance is remarkably constant, even if the transformer is subjected to very rough handling.

Owing to the high permeability of the nickel-iron core, the amplification obtainable by means of a transformer of this kind is not only high but also relatively uniform. These transformers are now being made by several manufacturers.

In using the transformer a condenser of about one microfarad may be introduced between the primary and the anode, the anode being fed from the H.T. source through a resistance. Owing to the interposition of the condenser the direct current is cut off from the transformer, and so does not interfere with its inductance

### NEXT WEEK

In next Thursday's issue of "P.W." there will be

## MORE ABOUT THE 'DECADE'

ORDER IT NOW. THREEPENCE.

value, which remains high. This condenser also helps to give good amplification of the bass frequencies and, as I say, the net result is that not only a good but also a uniform amplification is obtained over the whole of the ordinary audio-frequency range.

### Gramo-Motor Developments.

I was talking a little earlier about synchronous electric clocks, and that reminds me that the same principle is now being quite extensively applied to gramophone motors for working on alternating current. There are several motors on the market in which the principle of the simple synchronous motor or phonic wheel is utilised.

The phonic wheel, by the way, was first invented by Lord Rayleigh, a former Cavendish Professor of Experimental Physics at Cambridge and successor to the famous James Clerk Maxwell and predecessor to Sir J. J. Thomson and Lord Rutherford. The original phonic wheel is still at the Cavendish Laboratory, and if I remember rightly, it had four poles on the rotor and two pole-pieces on the stator.

In consequence of the small number of poles it was quite a work of art getting it going, and often took quite a long time. It was used for rotating a stroboscopic disc, and the phonic wheel was driven by interrupted current from an electrically-operated tuning fork. When everything was working properly the poles of the rotor passed the field poles in synchronism with the vibrations of the tuning fork.

### Obtaining Smooth Running.

Since those days great improvements in this type of motor have been made, particularly in the direction of increasing the

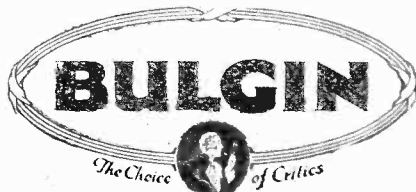
(Continued on next page.)

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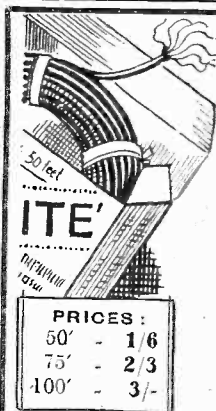


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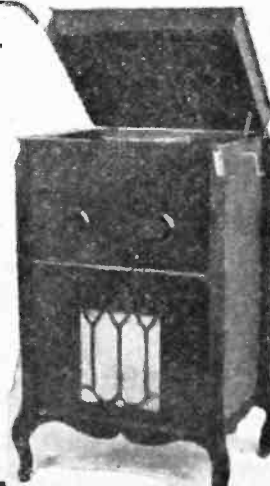
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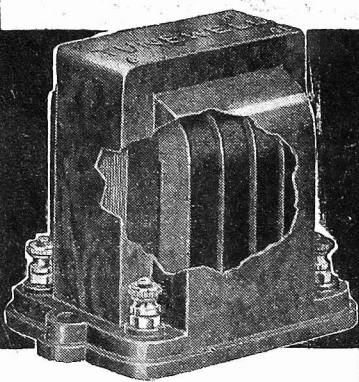


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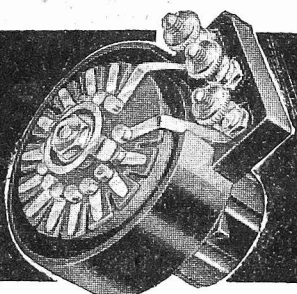
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# TUNEWELL

TUNEWELL RADIO LTD.  
54, STATION ROAD, LONDON, N.11.

## TECHNICAL NOTES

(Continued from previous page.)

number of poles both on the rotor and on the stator, these being often increased to as many as 50 or 100 poles. This makes for steadier running and much greater ease in getting the rotor to run "in step."

The advantage of a gramophone motor operating synchronously in this way is that it runs at a speed which is as steady as the frequency of the A.C. mains. Such a motor, of course, runs only at one fixed speed, and there is no such thing as a speed regulator or governor connected with it.

### Correct Playing Speed.

In view of the importance of running a gramophone record at a constant speed, you will see that to have the motor synchronised with the mains is a great advantage. Not only does it run at a constant speed, but it also runs at the correct speed, which I am afraid many ordinary gramophones do not.

I think there is a great future for electric gramophone motors and for synchronous ones in particular. I was talking to a manufacturer of gramophone motors a week or two ago, and he told me he was anticipating that within a comparatively short time spring-driven gramophone motors would become only a small percentage of the whole.

Naturally there will always be a demand for hand-operated machines for places where no electricity is available, but it seems pretty obvious that in cases where electric supply is available the clock-work gramophone machine must soon give place to the electric type.

### Piezo-electric Crystals.

I suppose most of you have heard about piezo-electric crystals which have been a good deal used in connection with standard-frequency for radio transmissions and also latterly in connection with the Stenode Radiostat receiving system. The best-known example of piezo-electric crystal is quartz, the plate of quartz being cut from an original quartz crystal in a certain plane in relation to the axes of the crystal.

There are other crystals which act in a similar way, of which Rochelle salt is a prominent example. The crystal plate has the property that it expands and contracts in accordance with alternating potentials applied to its surfaces. When it is used in a radio circuit the circuit can be so arranged as to maintain a constant frequency of oscillation.

### An Alternative Method.

There are certain serious difficulties involved in the use of quartz or natural substances of this kind, as they vary very much from one specimen to another. It has more recently been proposed to use the property of magnetostriction which is possessed by various magnetic substances and is found to be pronounced with a special alloy of nickel iron and chromium.

A wire or rod of this substance, for instance, will vibrate, or rather will suffer elongations and contractions in its length, in synchronism with applied alternating magnetic fields and the important point is that this action takes place at very high frequencies. The effect, of course, varies

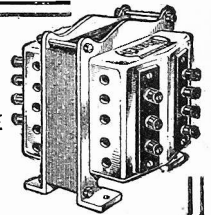
(Continued on next page.)

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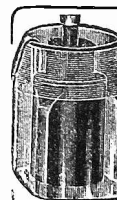
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MOST NEWS  
**SUNDAY GRAPHIC**  
and Sunday News



## TECHNICAL NOTES

(Continued from previous page.)

with the dimensions of the specimen of the substance and also with the intensity of the field which is applied.

With both the quartz crystal and the magneto-strictive substance there occurs a fundamental frequency of vibration at which the effect becomes most pronounced, and in this way the arrangement can be used for controlling the frequency of radio waves used in transmission.

The special alloy used for magneto-strictive effects can be much more definitely controlled in its properties than natural substances like quartz or other crystals, and consequently it seems likely that this magneto-strictive effect, which for many years was regarded simply as a scientific curiosity, may be turned to important practical use, like so many other scientific curiosities have been during recent years in the advance of radio science.

## THE LISTENER'S NOTEBOOK

(Continued from page 368.)

to know how to get his stuff over. There was a liveliness, too, but this may have been due to the inspiring influence of Broadcasting House; after all, environment can make a difference.

The first of the "Hazard" talks came entirely up to expectations. It struck me, during the talk, how difficult it must be for the Rear-Admiral—as it will also be for subsequent speakers—to speak honestly yet humbly of experiences in which he himself was obviously the hero. The same might have been said of the speakers in the "Escape" series, but, personally, I feel that there is in this new series peculiar opportunities for self-glorification which didn't arise in the other.

East is East and West is West, and one may add as a corollary, Eastern music is Eastern and Western Western. Mr. H. B. Drake made the difference very clear in his talk on Korean and Japanese music.

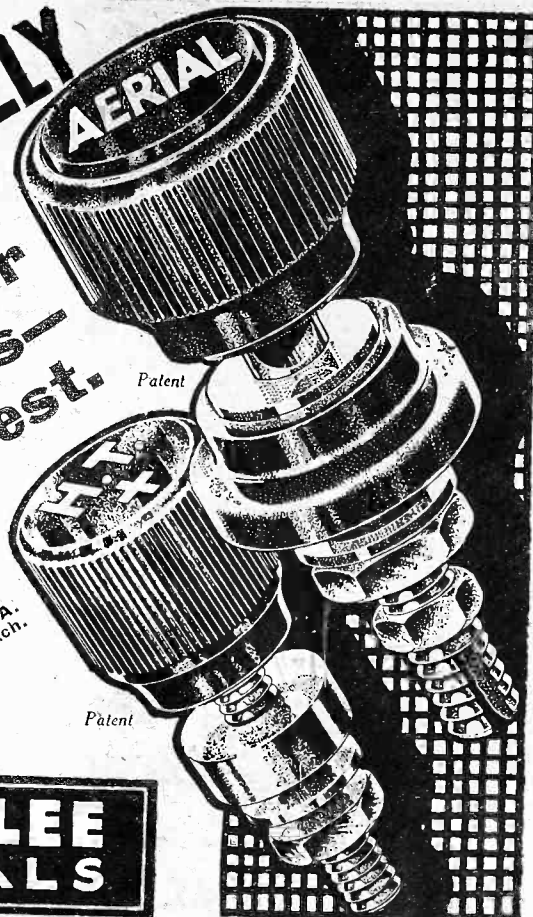
I can't say I enjoyed his selection of Eastern songs—I don't suppose I was expected to—for the agonising notes and cadences of those lovesick Koreans sounded strangely foreign—indeed, primitive—to one accustomed to that more virile (?) expression of lovesickness so beloved of our yearning Yolandes.

The talk, I suppose, would be classified as educational. On those grounds only could it justify itself. If it were intended as entertainment, then one song only would have been ample. A series of songs such as Mr. Drake gave us upsets one's mental equilibrium.

It is a pity that Covent Garden's opera season comes so late in the London musical calendar; at a time when the average listener is getting a bit weary of big music. For myself, I listened to the first two broadcasts with rather flagging interest, although I couldn't help remarking once again on the marvellous acoustic qualities of the Royal Opera House. I tuned in, of course, for "Götterdämmerung," but made atmospheric an excuse for switching off a few minutes later.

(Continued on next page.)

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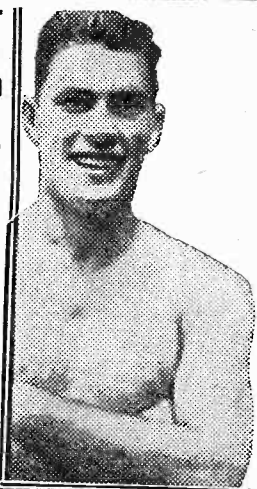
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Of course, there are many more splendid features in the JUNE CASSELL'S, including contributions from BEVERLEY NICHOLS, FRANK H. SHAW, E. C. BULEY and others.

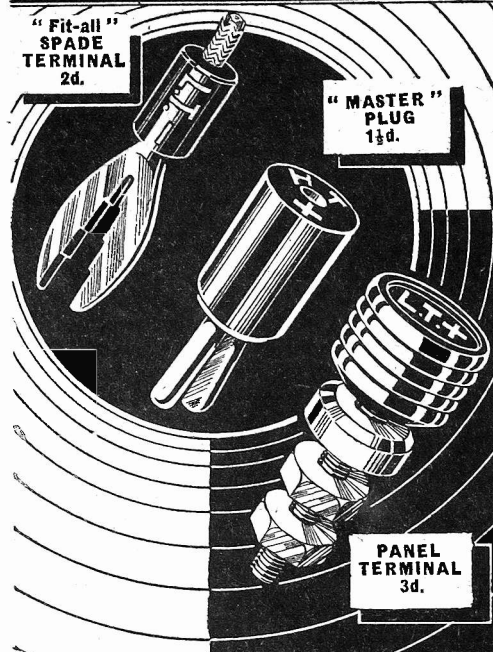
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## THE LISTENER'S NOTEBOOK

(Continued from previous page.)

Actually, this was a feeble excuse, for the disturbance wasn't as bad as all that. It was, I suppose, because I have had my fill of big music for the time being, and need, as much as the performers themselves, the rest which the close season offers.

\* \* \*

Though our enthusiasm for wireless is a genuine one, I shouldn't be surprised to hear from listeners that with something like summer weather when the call of the open (or garden) is irresistible, the set is put on short time.

In fact, I have heard this in several quarters already. "Apart from the news bulletins, we have listened-in to little else; our enthusiasm seems to have gone, but only temporarily, I'm sure," writes a correspondent.

And this is the sort of feeling many listeners must be experiencing now. After all, wireless is not an ideal out-door pastime; it is something to be enjoyed at home with the family; and family life is more intimate in winter than in summer.

Friends and relations, too, have their own sets, and it is no special treat to them for you to switch on whenever they call. The fact is they have dropped in for a chat, and the set is switched off forthwith.

Not that music isn't sometimes used as a sort of background to social intercourse. It is, alas! far too often, to the detriment of both conversation and music.

\* \* \*

I am sorry to think that we have heard the last of Professor James Ritchie's talks. These will be long remembered, because they were both entertaining and instructive. This combination of qualities, met with only too rarely in broadcast talks, is the unique possession of the popular broadcaster.

Whether the entertainment value of a talk is due more to the personality of the speaker than to the nature of the subject he is dealing with, it is difficult to say, though I do feel that personality counts for a good deal.

## HIGH SLOPE DETECTORS

Some interesting facts about this  
type of valve

By JEREMY GREY.

**D**URING the last season or so there has been—I will not say a craze, but a distinct movement towards the "high slope" detector. The basic idea, of course, is quite sound—the achievement of a big stage gain—a large audio-frequency voltage from a comparatively small signal voltage.

Experience, however, has shown that this very worthy object is not always achieved in practice. Other phenomena conspire to defeat the advantages which one would expect to result from a detector having a high mutual conductance.

These phenomena are usually considered collectively under the heading of "input impedance," which means that their united effect on the detector stage is similar to placing an impedance in parallel with the grid circuit. It is of interest, however, to analyse the exact causes of these losses.

In the first place, much of the trouble is due to inter-electrode capacity. High mutual conductance with high amplification factor means low impedance, and to achieve this, the clearances between the electrodes of the valve must be made very small—thus increasing the inter-electrode capacity. The practical effect of high anode-grid capacity is equivalent to connecting between the grid and cathode a circuit possessing both capacity and resistance.

### "Miller Effect" Losses.

Two disastrous results follow: first, part of the energy received from the aerial is dissipated, thus decreasing the voltage available on the grid of the detector; and second, because the reaction shunted across the grid circuit varies with the frequency of the incoming signal, the ganging of the various tuned circuits will not be constant.

The resultant flat tuning of the grid circuit reduces both the selectivity of the receiver and the voltage applied to the grid.

The combination of these evils is known as the "Miller effect," and is the principal cause of inefficiency in circuits employing steep slope detectors.

There is, however, a further source of loss, namely the lowering of the cathode-grid impedance, which is almost inevitable in the design of high-slope detectors. As a result of this, the grid current flowing under detector conditions is fairly high and serious damping occurs in the grid circuit.

It can be calculated that if the mutual conductance is increased 100 per cent, the losses due to input impedance are increased by nearly 300 per cent, and there is a definite limit beyond which the increased inter-electrode capacity cancels any gain resulting from high mutual conductance.

### Overcoming the Difficulty.

Indeed, many valves now on the market have already exceeded this economic limit, and it is good news to learn that one manufacturer has had the courage to modify the design of an existing high mag. detector in order to obviate these losses, in spite of apparent reduction in "paper" characteristics.

The Mullard 904 V is now made with a slope of 2.2, as against 6.5 in the earlier supplies. The inter-electrode capacity has been approximately halved, and it has been established by practical test that the new valve has a higher efficiency as detector, and, in addition, its use improves the selectivity of the receiver and the accuracy of the ganging of tuning condensers.

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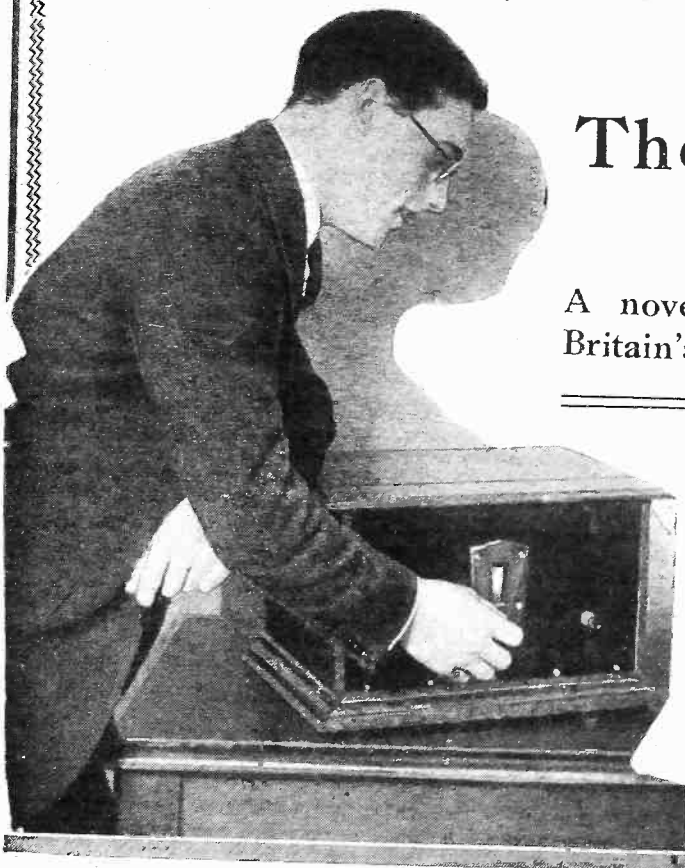
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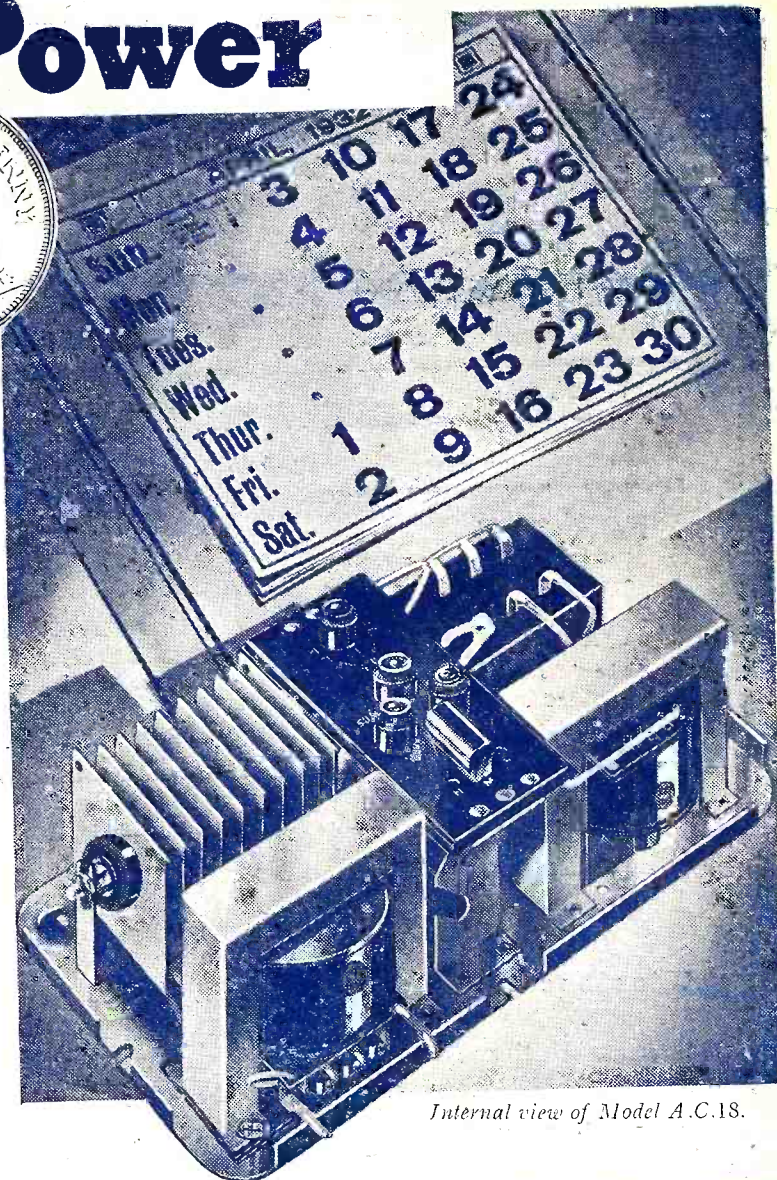
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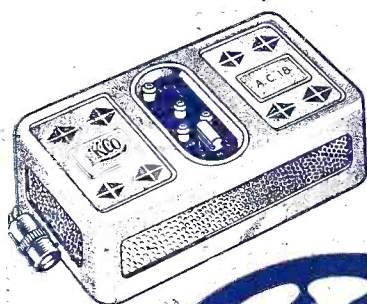
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Internal view of Model A.C.18.



External view: all models are similar in appearance. Size, 9 x 5 x 3 1/2.

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