

**A TALK WITH A FRENCH LISTENER** (See Page 1487)

# Popular Wireless

Every Thursday  
PRICE  
**3d.**

No. 509. Vol. XX.

INCORPORATING "WIRELESS"

March 5th, 1932.

## YOUR "COSMIC" ON SHORT WAVES

*See  
Inside!*



AND DON'T MISS :  
THOSE SUNDAY PROGRAMMES  
AND  
SHORT-WAVE PICTURES

ALSO THIS WEEK :  
SELECTIVITY AND POWER ON  
YOUR "COSMIC"

By G. V. DOWDING, Associate I.E.E.

**READY RADIO**

**Official Blueprint Kits.**

See pages

1501  
1502  
1503

(Advt.)

**COSMIC STAR**





*A Quality Standard Ensuring Perfect Reception  
and Unequalled Long-Life Economy!*

**T**HE in-built quality of Pertrix Dry Batteries and Accumulators combined with craftsmanship in manufacture definitely assures finer, farther and more pleasing reception. To change to Pertrix is to enjoy a new experience—an experience of **BETTER** wireless, smooth, silent power combined with a **LONGER LIFE** which means a new economy.

Instal Pertrix to-day and **KNOW** how good and how economical *your* set can become. Of all good Radio Dealers.

Made by  
**BRITANNIA BATTERIES  
LIMITED.**

at Redditch, who also make:  
Batteries for Central Stations  
● Batteries for Country  
House Lighting ● Emer-  
gency and Stand-by Lighting  
Batteries for Theatres,  
Cinemas, Hospitals, etc. ●  
Batteries for the Starting  
and Lighting, and Ignition  
of Motor Cars, Motor Cycles,  
Buses and Coaches ● Bat-  
teries for Electric Vehicles,  
Trucks, Locomotives, Ships  
and Yachts ● The only  
Nickel-Iron Batteries on sale  
in Britain that are entirely  
made in this Country.

**PERTRIX**  
SUPER LIFE  
**DRY BATTERIES  
ACCUMULATORS**

**BRITANNIA BATTERIES  
LIMITED,**

Britannia House,  
233, Shaftesbury Avenue,  
London, W.C.2.

Works: Redditch.

Telephone:  
Temple Bar 7971 (5 lines)

Telegrams:  
Britanicus, Westcent  
London.

***Yours for (6/-) Down***

## 6/- Down

Balance in 11 monthly payments of  $4/9$ .

Balance in 8 monthly payments of  $5\frac{1}{4}$ .

Balance in 11 monthly payments of 6.10.

# 10/- Down

(Cash price £6 0s. 0d.)  
Balance in 11 monthly payments of 11/1

# 7/6 Down

**PILOT PERMANENT MAGNET MOVING-COIL SPEAKER**, in handsome solid oak cabinet, with multi-ratio input transformer. (Cash price **£3 15s. 0d.**) **Balance in 11 monthly payments of 6/10.**

**ALWAYS FIRST—ESTABLISHED 1919**

# PETO-SCOTT

**Telephone : Chancery 8266.**

**Any of the Items advertised in this page are  
also supplied CASH or C.O.D.**

ADDRESS .....

P.V. 5-3-3:

SEEN IT?

The March  
Number of

# MODERN WIRELESS

A Wonderful  
Shillingsworth  
NOW ON SALE

## BRITAIN'S LEADING RADIO MAGAZINE—

scores another great success with the March Number, which is now on sale. It contains many enjoyable articles, on every phase of radio, by acknowledged experts. Among the features for constructors are:—

### The "BI-BAND" THREE

A logical application of the band-passing method for obtaining super-selectivity, and a breakaway in 3-valve set design, for the man who wants "distance" and unusually good quality.

### AN ECKERSLEY TUNER UNIT

#### TO MAKE YOUR SET SELECTIVE

For the many constructors who realise the advantages of using an Eckersley Tuner, but who are unable to build an entirely new set or modify the existing one. This adaptor is *immediately* applicable to an existing outfit.

### The "M.W." "CABINET" TWO

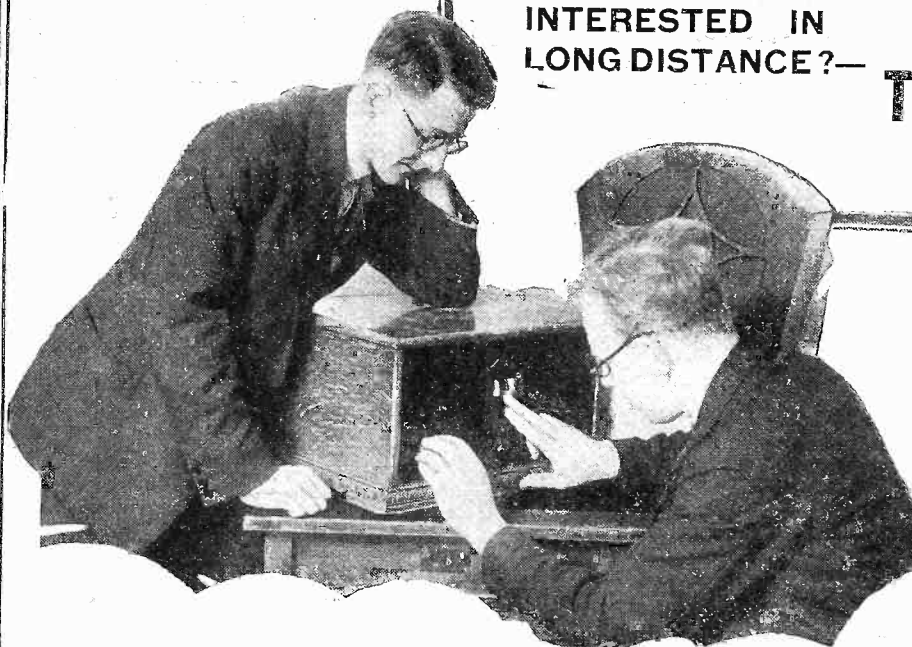
An up-to-the-minute two-valver built in console form with loud-speaker incorporated. The only external leads are the aerial and earth wires, and the set is economical to make and maintain.

Every Set-Owner and Music Lover will find something to fascinate him in the March "M.W." Here are the titles of a few of the articles you should read:—

Sir Herbert Austin on What Radio Might  
Do For British Trade  
Power From Low-Voltage Mains  
How H.T. Batteries Are Made  
Round The Turntable  
Picking Your Valves  
The New News Arrangements

Do Constructors Score?  
A Radio Reckoner  
Questions Answered  
The New B.B.C. Dance Band  
Trouble Tracking  
On the Test Bench

Recent Record Releases  
On the Short Waves  
Power Valve Problems  
Headphone Reception on Multi-Valvers  
That Air Gap  
Those Mains Sets  
More Selectivity



INTERESTED IN  
LONG DISTANCE?—

Then Read  
**THE WORLD'S  
PROGRAMMES!**

"M.W.'s" Special Section for assisting you in the reception of foreign stations is packed with live information about conditions, dial readings, times to listen, hints on handling, etc.

**PRACTICAL!****PRECISE!****UP TO DATE!**

Here are some of the special foreign-station features in the March issue:—

What the Distant  
Stations are Doing  
Radio Spotlights  
Getting the Americans

Station Information  
Yugo Slavia's Big Noise  
A Visit to Ljubljana  
The Empire  
Short-Wave Service

Station Alterations  
How, When and Where  
Coasts of Canada  
On the Medium  
Wave-lengths

Radio Research  
Heard in the Interval  
German Technique  
Using a Frame

SECURE  
YOURS  
TO-DAY

# MODERN WIRELESS

ON SALE  
Everywhere  
1/-



# IMMEDIATE DELIVERY OF PILOT AUTHOR KITS

-C.O.D.

CASH or  
H.P.

## KIT-BITS

Selected Components

CASH or C.O.D.

Pay the postman. We pay post charges on all orders over 10/-

# Exact to Specification

## COSMIC III As described in "Popular Wireless," February 13th, 1932.

### KIT "A" Author's Kit, less valves and cabinet.

CASH or C.O.D. 70/-

EASYWAY:

12 monthly payments of 6/5

Valves as specified, £1 : 10 : 6  
Cabinet, 17/6.

### KIT "B"

Author's Kit, with valves but less cabinet.

CASH or C.O.D. £5 : 0 : 6

EASYWAY:

12 monthly payments of 9/3

### KIT "C"

Author's Kit complete with valves and cabinet.

CASH or C.O.D. £5 : 18 : 0

EASYWAY:

12 monthly payments of 10/10

This is the Kit of Parts actually used and specified by "P.W." Technical Experts.

	s.	d.
1 Baseboard, 10" deep	1	0
1 Peto-Scott Panel, 14" x 7", ready drilled	4	6
1 Cydon Extender, Type Ex.5V	16	6
1 Telsen "Cosmic" Dual-Range Coil	5	6
1 Telsen "Cosmic" Short-Wave Coil	4	6
1 Ready-Radio .00075-mfd. Condenser	3	6
1 Ready-Radio .0003 Condenser	3	6
1 Goltone Push-pull "On-off" Switch	7	
1 Ready-Radio 3-point Push-pull Switch	1	6
1 Peto-Scott Moderator Coil Unit	2	6
1 Dubilier .0003 Fixed Condenser, Type 610	1	8
1 T.C.C. .001-mfd. Mica Condenser	3	0
1 Lissen Grid-Leak Holder	1	0
1 Lissen 2-meg. Grid-Leak	1	0
1 Graham Farish .5-meg. Grid Leak	1	6
1 Graham Farish Grid Leak Holder	1	6
3 Lotus Valve holders, Type THK	1	6
1 Lewcos H.F. Choke, Type II	6	0
1 R.I. Dux L.F. Transformer, medium ratio	4	9
9 Belling-Lee Indicating Terminals, Type R	2	3
1 Sovereign 100,000-ohm Spaghetti Resistance	1	3
1 Peto-Scott Terminal Strip, ready drilled	1	3
1 Bulgin Grid-bias Battery Clip, No. 1	6	
Connecting Wire, Flex, Screws, and 3 G.B. Plugs	6	
10 ft. Glazed Connecting Wire	6	

Any parts supplied separately. If order value over 10/- sent Carriage Paid, or C.O.D. Post charges paid.

## COSMIC III STAR As described in "Popular Wireless," February 20th, 1932.

### KIT "A" Author's Kit, less valves and cabinet.

CASH or C.O.D. 87/6

EASYWAY:

12 monthly payments of 8/-

Valves as specified, £1 : 10 : 6  
Cabinet, 17/6.

### KIT "B"

Author's Kit, with valves but less cabinet.

CASH or C.O.D. £5 : 18 : 0

EASYWAY:

12 monthly payments of 10/10

### KIT "C"

Author's Kit, complete with valves and cabinet.

CASH or C.O.D. £6 : 15 : 6

EASYWAY:

12 monthly payments of 12/5

This is the Kit of Parts actually used and specified by "P.W." Technical Experts.

	s.	d.
1 Panel, 14 in. x 7 in. READY DRILLED AND SLOTTED FOR PANEL CONTROLS	4	6
1 Baseboard, 10 in.	1	0
1 Ready Radio Duotune Extender	18	6
1 Ready Radio .00075-mfd. vari. condenser	3	6
1 Ready Radio .0003-mfd. reaction condenser with slow-motion drive	7	0
1 T.C.C. .0003-mfd. fixed condenser	1	3
1 T.C.C. .001-mfd. fixed condenser	1	6
1 T.C.C. .001-mfd. mica fixed condenser	3	0
1 Goltone "Cosmic" dual range coil	5	6
1 Sovereign "Cosmic" short-wave coil	4	0
1 Peto-Scott moderator coil	2	6
2 Ready Radio push-pull "on-off" switches	1	8
1 Ready Radio 3-contact push-pull switch	1	6
1 Ready Radio radio-gram rotary switch	2	9
1 R.I. type FV1 H.F. choke	7	6
1 Lewcos L.F.T.6 L.F. transformer	10	0
3 Telsen 4-pin valve holders	1	6
1 Lissen 100,000-ohm Spaghetti resistance	1	9
1 Dubilier 2-meg. grid leak and holder	2	9
1 Dubilier .5-meg. grid leak and holder	2	9
1 Terminal strip, 14 in. x 2 in., ready-drilled	1	3
9 Belling-Lee terminals	2	3
10 ft. Glazed Connecting Wire	6	
3 Battery plugs, screws, flex, etc.	6	

Any part supplied separately. If order value over 10/- sent Carriage Paid, or C.O.D. Post charges paid.

## COSMIC III

CYLDON Extender, with disc drive slow motion, Type Ex.5	16	6
Set of "Cosmic" Coils, comprising Dual Range, Short Wave and Moderator Coils	12	6
Set of Specified Valves	£1	10 6
Cabinet as specified	17	6

## COSMIC III STAR

1 ReadyRad Duotune Extender	18	6
Set of "Cosmic" Coils as specified	12	0
Set of Specified Valves	£1	10 6
Cabinet—to specification	17	6

## COSMIC III FINISHED INSTRUMENT

factory wired and assembled from specified components, broadcast tested. Complete with valves and cabinet and including royalties.

CASH or C.O.D. 7 GNS.

21/- down and 11 monthly payments of 12/6.

## COSMIC III STAR FINISHED INSTRUMENT

factory wired and assembled from specified components, broadcast tested. Complete with valves and cabinet and including royalties.

CASH or C.O.D. £8 : 0 : 0

25/- down and 11 monthly payments of 13/6

## RECOMMENDED ACCESSORIES

Dlex 120 v. H.T. Battery	24/-
(Triple Capacity Type)	
Ddex 9 v. G.B. Battery	1/-
Ede 2 v. 30/60 L.T. Accumulator	11/-
Be Spot 100 U. Unit and Chassis	£1-19-6

ALWAYS FIRST-ESTABLISHED 1919

# PETO-SCOTT

CO. LTD.

72 CITY ROAD, LONDON, E.C.1. Telephone: Clerkenwell 9406-7-8. 62, HIGH HOLBORN, LONDON, W.C.2. Telephone: Chancery 8266

Messrs. PETO-SCOTT CO. LTD., 77, City Rd., London, E.C.1  
Please send me C.O.D./CASH/H.P.

"COSMIC" III KIT A/B/C

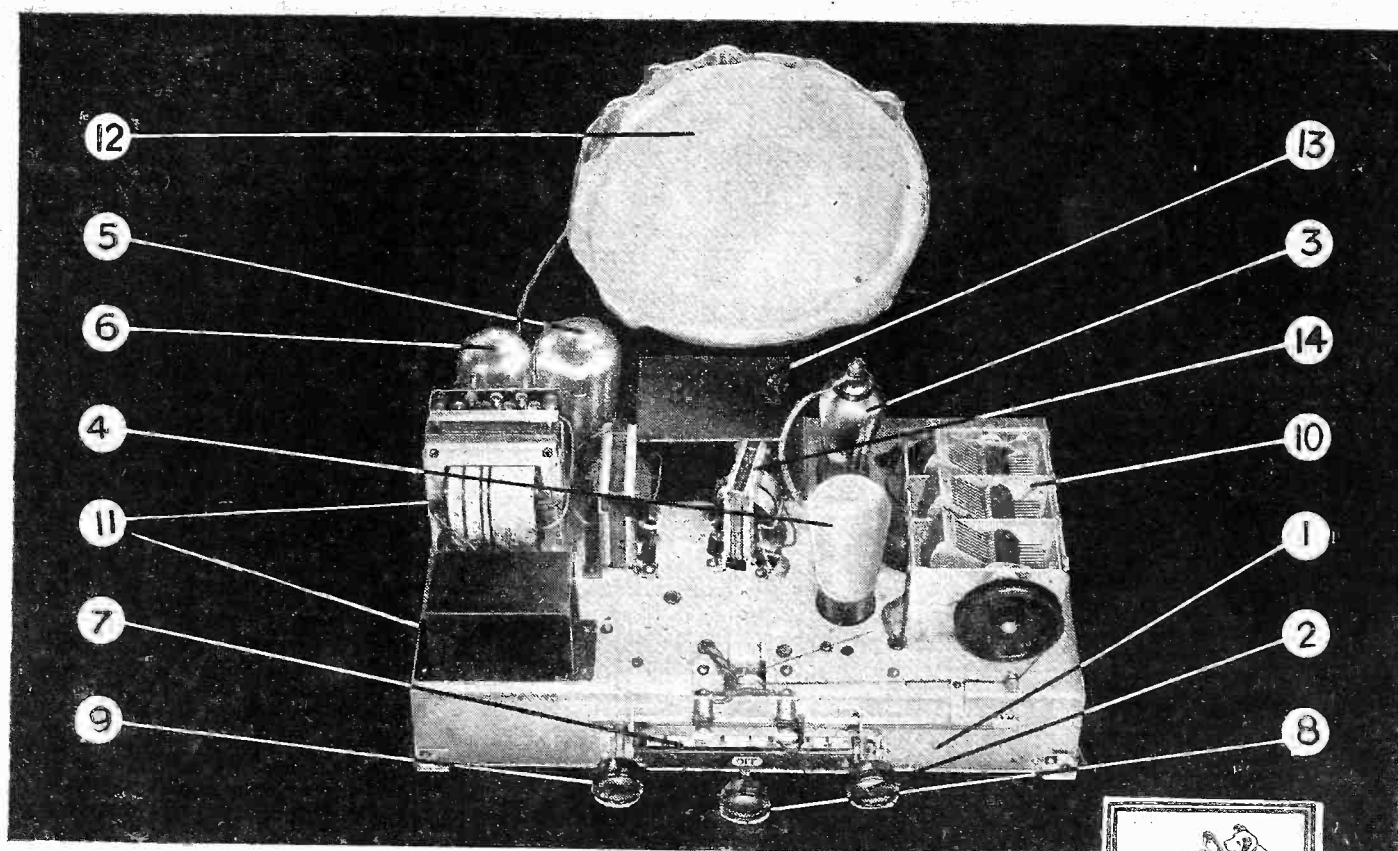
"COSMIC" III STAR KIT A/B/C

for which I enclose £ s. d. CASH/H.P. Deposit.

NAME

ADDRESS

P.W. 5-3-32.



## Precision Engineering— not at one point— but at every point!

The above photograph of the chassis and loudspeaker removed from the walnut cabinet of the "His Master's Voice" Model 435 shows the clean layout and sturdy construction of the radio-receiver that has been described in the technical press as "one of the most outstanding triumphs of the British Radio Industry."

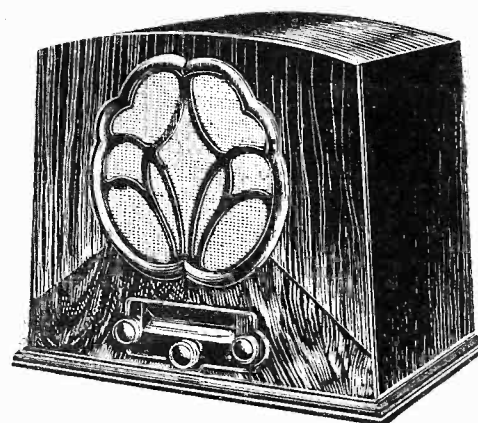
- (1) Cadmium plated chassis.
- (2) Combined "On — Off" and wavelength switch, automatically presenting appropriate scale.
- (3) Screened - grid high frequency valve making all worth-while stations audible.
- (4) Leaky-grid detector valve, ensuring superb quality of reproduction.
- (5) Super power pentode output valve.
- (6) Rectifier valve enabling receiver to be operated direct from electricity mains —no batteries.
- (7) Four separate illuminated scales showing "off," "medium waves," "long waves" and "gramophone."
- (8) Single tuning knob moving pointer across wavelength scale.
- (9) Combined volume control for radio and gramophone pick-up.
- (10) Three ganged condenser and band-pass filter circuits provide knife-edged tuning from a single knob.
- (11) Specially designed mains transformer enables instrument to operate from different voltage ranges by a single plug and socket system.
- (12) New type permanent magnet moving-coil loudspeaker, housed in a dust-proof cover to keep fine gap clear of dust.
- (13) Additional loudspeaker, remote volume control and gramophone pick-up sockets.
- (14) Interval transformer may be swivelled into position, securing the minimum of hum.

"His Master's Voice," Model 435, three-valve radio-receiver — Band-pass tuning — single dial control — incorporating moving-coil loudspeaker.  $1\frac{1}{2}$  to 2 watts output. Mains aerial in A.C. Model.

Voltage ranges and consumption — A.C. : 95-164, 190-260 volts, 50-100 cycles; 35 watts. D.C. : 190-250 volts; 60 watts.

# PRICE 20

or on Easy Hire Purchase Terms. GNS.



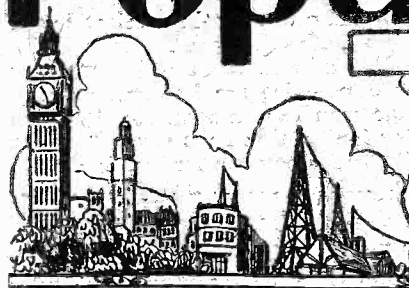
The Gramophone Co. Ltd. London, W.1.

# His Master's Voice

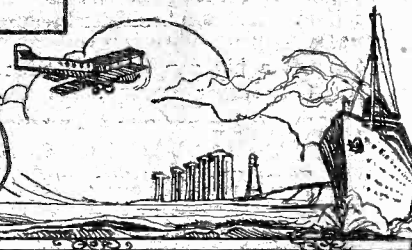


# Popular Wireless

## 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.



**HENRY HALL**  
**S.G.'s AS DETS.**  
**ARE WE SLOW?**  
**"COSMIC"**

## RADIO NOTES & NEWS

**WOBBLY VALVES**  
**ROUGH ON SHANGHAI**  
**WILD AND WOOLLY**  
**THE COY MOTH**

Welcome to Henry Hall.

HAVING dry-wept over the imminent departure of Jack Payne's band, I feel that it is the proper thing to bid his successor-to-be welcome. Payne's crowd converted me from an inveterate non-listener to dance music into an admirer of their sweet and lively noises, though I never cared much for the crooning solos.

Well, Henry, I am glad to learn that you like sweet music, and that you are not going to make the programmes too "hot." All the best! "Ariel" will have his sympathetic eye on you.

**S.G.'s As Detectors.**

IN "P.W." for January 9th we published an article on the application of screened-grid valves as detectors, which I hope you have all duly digested. I was reminded of this by a letter from A. S. F. (Southampton), who tells me that three months before that article appeared he clapped an S.G. into circuit in place of a det. which had gone where the good niggers go, and had achieved results as good as those given by the dear departed, with no alteration of connections or parts.

So there you are! That proves it! Oh, by the way, A. S. F., your suggestions have been noted, and the result is on the lap of the Olympians.

**Are We So Slow?**

ONE cannot but admire the slick way in which the E. K. Cole people whacked things about after the fire in their factory at Southend on February 4th.

Twelve hours after the fire brigade had poured a lot of water over the outfit a nucleus organisation of all departments was at work, and thirty hours after the fire 15,000 dealers had received letters informing them that the delay on deliveries would be so small as not to count. Let us set this against the complaints which we hear about slow British business firms.

**"Cosmic"!**

ARE you in this "Cosmic" game? Everybody's doing it! The "trade" has gone "Cosmic," which is good business, considering that it has also to

chew on "The Wireless Constructor's" "S.T.300." It's the biggest slide I have seen—barring the recent General Election—and it's backed by solid, sound reasons.

The year opens well indeed for amateur radio, and if you hear anybody hinting that home "hooking" is dying, just say "Cosmic." For a clean, intellectual, useful hobby there has been nothing to equal radio since the good old "B.O.P." amazed our great-uncles in the '80's by telling 'em how to make a pin-hole camera out of a cigar-box!

**Short-Wave Business.**

ALF MANN, who, I am glad to learn, is back in London and on a job, has sent us his thanks for the support which "P.W." gave to him in his attempt

**"BE PATIENT, NOW—BE PATIENT!"**



Being in hospital is not half so bad nowadays, especially when the B.B.C. switches out the chamber music and puts on Roy Fox, or some lively lad who knows how to start "Kicking the Gong Around." This is a typical scene in St. George's Hospital, London.

to get new members for the I.S.W.R. Society.

Over 100 free copies of the Society's Bulletin were sent off and ten new members were enrolled. My recent note about a reader's complaint of non-attention by the society's headquarters at 106, Lord Street,

Southport, England, has received his severe attention, and I hope to have an explanation shortly.

If you want details of this society and a copy of their organ, write to the Southport address and enclose 1d. in stamps for postage.

**Come, Jules!**

I AM indebted to an overseas reader, A. R. C. (Caen, France), for a very interesting note on the state of radio practice in France, from which he concludes that R.F. is one stage in progress behind "Perfidious Albion." Little or no originality is shown in design, the sets being a mixture of British and American ideas.

Metal rectifiers are only just coming into use there, as also is "band-pass" tuning. Ganged condensers, too, are a novelty there, and valves are inferior to ours—which probably accounts for the exemption of Britain from their tariff wall against foreign valves.

**"Where is Television?"**

MR. E. T. FISK, an Englishman and ex-wireless operator, and now the biggest figure in Australian commercial radio, being the Managing-Director of Amalgamated Wireless (Australasia), Ltd., says in "Radio Monthly," referring to television on the scale of modern broadcasting: "I cannot see the prospects of such interesting achievements appearing on any large scale before the year 1935. I am not yet prepared to predict how soon after 1934 television, on the scale referred to, will be in existence." And, again, "it is as yet in an experimental stage."

**Edgar Wallace.**

ALAS! one of the most remarkable writers of our generation has gone in the heyday of his success! Edgar Wallace, who used to be a newsboy in Ludgate Circus, and who, by his own energy and fertility of mind became a seller and a best seller, and a seller all the time all over the world, has been removed with a suddenness which made us catch at our breath.

He won his success in fair fight against  
(Continued on next page.)

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

adverse beginnings, and enjoyed it as happily as a boy. Many are the poor ones who are the warmer and healthier because of his bounty.

He has left a big gap, and his memory will live the longer because his books appeal when the erudite and sophisticated caes bore us.

## Those Wobbly Valves.

IT is agreed that sometimes the colicision between bulb and base hath something lacking. Probably this ariseth in that the youth of Britain waxeth strong in the



grip! I have already revealed to ye that glue—of the tubish variety—will stick bulb to base, but as a true friend of "P.W.," J. W. P. (Waterfoot, Lancs) hath written, right laboriously, I trow, to say that he

uses wax from an old H.T. battery, I hasten to acquaint ye thereof, lest his labour be lost. But I wouldn't bet much on the holding powers of wax as compared with those abominable and stinking concoctions sold as liquid glues—Seccotine and sichlike!

## It Still Goes On!

THIS 'ere Progress. It still goes on," quoth the muddleheaded old man in "The War in the Air." Why, I learn that the U.S. Army Signal Corps now has a 17½-ounce transmitter which is elevated by a balloon, the supporting wires forming aerial and counterpoise. This transmitter has a range of 11 miles and can continue in operation for 4 or 5 hours. Its signals are observed by ground direction-finders, and so the course of the balloon in the upper air can be plotted, giving valuable data for aviation and meteorology.

## Rough on Shanghai.

I AM sorry, heartily sorry, for the folk in the Concessions at Shanghai, for I fear that before these Notes are published they will have had a rough time. Machine-gun fire at Garden Bridge!



Shades of twenty years ago, when I dawdled thereon, rejoicing that I was seeing new things and people. I found then a very rummy radio station, but a very efficient telephone

exchange and a general hospital replete with all manner of electrical devices of the high-frequency sort.

After showing me Chinamen being cured—or relieved—of rheumatism by lying inside huge solenoids the genial, though Scottish, chief of the hospital dined me at his house in the French Concession—and I remember yet his wine and his daughter. (Ariel! What is that you are writing? Mrs. Ariel.)

## The Study of Radio.

IN reply to C.W. (Burnley) and others who seemed to appreciate my suggestion that keen amateurs ought to study the theory of wireless, and have asked for my advice on the method of approach. I would say that, without adverse reflection on many other good books, the best I know for the use of beginners is "The Elementary Principles of Wireless Telegraphy and Telephony," by R. D. Bangay, *third edition*.

It is written in simple, luminous English, and is non-mathematical. "P.W." from time to time publishes instructional series.

## New Chairman of R.M.A.

IT will interest many of us to learn that Mr. Leslie McMichael, A.M.I.E.E., has been elected to the Chairmanship of the Radio Manufacturers' Association. Mr. McMichael was one of the earliest of radio

## SHORT WAVES.

Very particular young man: "It was my intention to propose to you this afternoon, Gladys, but I cannot do so until the B.B.C. has decided once for all whether I am to call you 'my young lady,' 'my betrothed,' 'my fiancée,' or what not."—"Punch."

The B.B.C. apparently takes all the credit for the recently revealed fact that there is a wireless set in every second home in Britain, and assert that they won't be satisfied until EVERY home has its set.

Are they also as eager to claim credit for the fact that on Sundays nine out of every ten listeners in London tune in foreign stations?

"Is your wife fond of listening-in?" "Not half so much as she is of speaking out."—"Answers."

One of the latest inventions, we hear, is a radio-controlled collar stud, which will emit a Morse signal when anywhere but in the shirt collar.

"Atmospheric disturbances cause a 'black snowstorm' on a television reception screen," says a contemporary.

Or, guessing what they look like at the other end, is it the black looks of the televised?

Courtship—He broadcasts. She listens-in. Honeymoon—She broadcasts. He listens-in.

Now—They broadcast. The neighbours listen-in.

They haven't got no gnosis, The bally B.B.C.; Even the word "Erose" is Not said as they supposes. They suffer from cirrhosis Of their mentality.

"Punch."

amateurs, a founder of the Wireless Society of London (now the R.S.G.B.), and took an active part in the negotiations leading to the first broadcasting, which was carried out at Writtle and which was quickly followed by the formation of the British Broadcasting Company.

## "In Search of Television."

MR. DOWDING'S balanced but provocative article under this title (see "P.W." January 30th) has in some quarters put the stearine in the stove—I mean "the fat in the fire"—and surprise is expressed by some of his admiring readers that our Technical Editor should

play hot and cold with the unscientific art; so to speak, of wagering on future events.

All this misconception and surprise is due to overlooking the fact that unless a scientific man can demonstrate, by some pleasing frailty, that he is also a "yuman bean," there is no room for him in modern society. And our G.V.D. is very much "one of us."

## Wireless in the Wild and Woolly.

A REPORT which is attributed to Reuter states not only that the Arabs now fix aerials to the humps of their camels and listen-in as they bumpetty-bump



over the desert, but that they have installed sets at the wells where they pull up for "a swift one." Fine! Esquimaux are training walruscs to stand up and support aerials; Tibetans are

now famous for their Yak-back Pack sets. A hunter in Brazil finds that he can get 5 S.W. on a 22-foot anaconda-aerial, which he has trained to swallow a gaspipe in order to straighten out the youthful curves; and the official aerial of a Zanzibar listening centre is a string of monkeys. If one lets go for a scratch, they tune in on teacher's nose-ringing!

## B.B.C. Interference.

SINCE the hunt is up and all are in full cry after sources of interference, what about the B.B.C. itself? It interpolates any mortal item with those Greenwich time "pips," and I verily believe that, as I have said before, it would interrupt the Trump of Doom itself with those irritating noises.

On the part of any entertainer such a maddening display of ill-taste would be an act of sheer lunacy. What can we say, then, when the B.B.C. is guilty of it, the B.B.C. which is so careful to preserve artistic values, etc.?

## The Coy, Codling Moth.

IF television is destined to be a "flop" for some years to come, the makers of photo-electric cells may perchance take heart of grace—and a friendly tip—from the news that the New Jersey Agricultural College has discovered that the Codling Moth, which mucks up peach and apple crops, declines to lay its eggs in daylight or in a temperature below 60 degrees



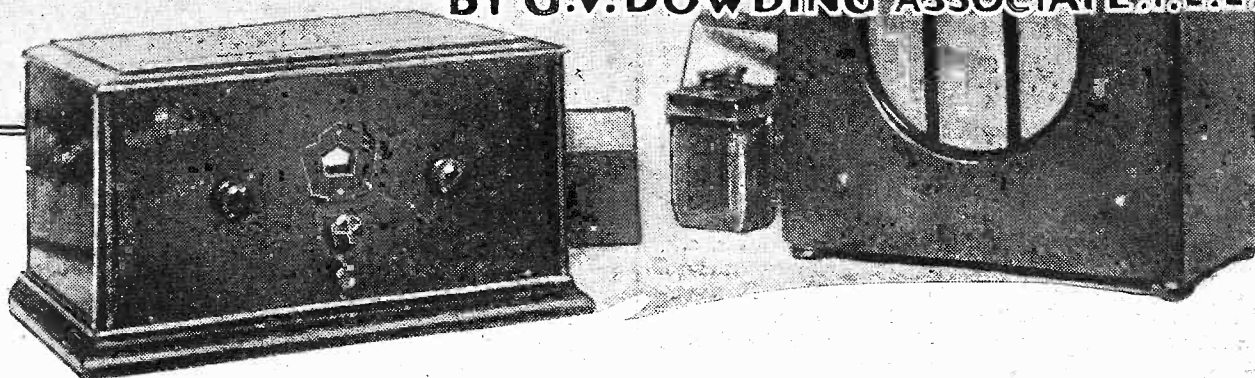
F. I can understand its diffidence in performing in the light of day, but not its quibbling about a degree or two of temperature. However, the suggested method of discouraging the Codler to produce a posterity is the flood-lighting of the orchards, the lights being turned on and off by photo-electric rays.

ARIEL



# SELECTIVITY AND POWER ON YOUR "COSMIC"

BY G.V. DOWDING ASSOCIATE I.E.E.



SEVERAL of our correspondents have remarked upon the fact that we have avoided giving a full list of stations and dial readings for the "Cosmic." There were several reasons which guided us in this step.

In the first place it is only a single-dial set, and there is not the difficulty of matching two or more sets of dial readings as with some sets. With these a "log" is almost essential.

## The Number of Stations.

But tabulating all the stations it is possible to receive on a "Cosmic" would make fantastic showing. In that the "Cosmic" covers three wave-bands, it is easy to compile an honest list of about one hundred and twenty, although it is extremely dubious whether any two listeners would get the same 120!

And in regard to actual dial readings—well, these will vary as with different coils and condensers, and can be of little use to individual constructors.

So, although a published "log" compiled by a skilled operator may be good "window-dressing," it is not always going to cause anything much more than confusion, and perhaps disappointment.

## First Results.

We believe it is better not to lead inexperienced constructors to imagine that they are certain to receive an enormous number of stations the very first time they "go on the air" with a new set, for there is always the possibility that they will get very poor results, however good the

If you want "fool-proof" sets, "P.W." can give them to you. But as we know "P.W." readers are, in fact, intelligent and highly discriminating radio enthusiasts, we have no hesitation in bringing forward various suggestions whereby "Cosmics" can be "tinkered" with to give maximum results in the worst possible conditions. After all, it's no consolation for a man whose results are not up to expectations to know that the majority of constructors have been fully satisfied, and bearing this in mind we designed the "Cosmic" with a view to an almost unlimited flexibility.

design from which they have built up their sets.

I don't think this will happen to many "Cosmic" constructors, but it is a possibility we had well in mind when we planned this new tri-band set of ours.

## "A Brick" in the Wiring.

Now what is likely to militate against success? What in such a simple instrument could cause: (1) Complete failure—dead silence; (2) very poor power; (3) inselectivity?

I should say, broadly speaking, three things: (a) Constructional mistakes; (b) faulty components or accessories; (c) abnormally bad local conditions.

The most careful of us are liable, at times, to make little mistakes, but once a little

mistake is made in the assembly or wiring-up of a wireless set it can be mighty hard to detect.

Nevertheless, it can be detected if you are prepared to spend a little time in going over the outfit point by point with meticulous care.

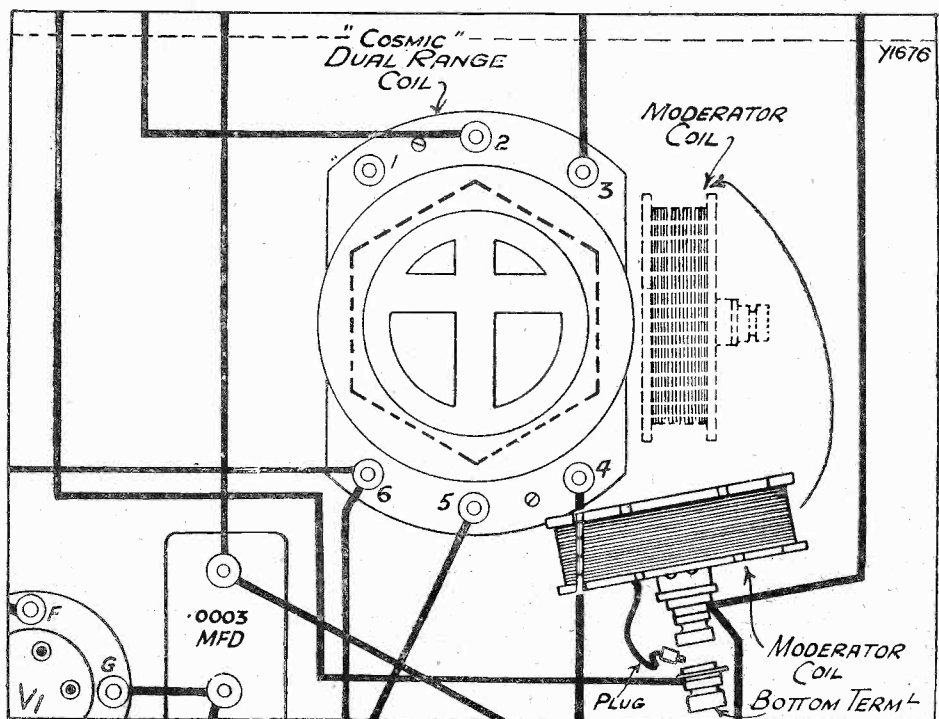
## Reserve Power.

Unfortunately, it is almost impossible for the constructor to detect slight faults in components which cause sub-standard results. Worse still, such slight faults are at times encountered in the products of some of the best manufacturers. There are very few firms indeed who can claim 100 per cent perfection in production.

Again, unfortunately, it is not always possible for the constructor to appreciate

(Continued on next page.)

## COMPENSATION FOR MINOR FAILINGS



Although the Moderator coil is at right angles to the dual-range coil there is a certain amount of magnetic linkage between them. This can be increased for greater volume and reduced selectivity by moving the Moderator to the new position shown above. Actually, if you have been losing power through some component or other fault, you will still retain good relative selectivity despite the change of coil position.

## SELECTIVITY AND POWER ON YOUR "COSMIC"

(Continued from previous page.)

the nature of his "local conditions," by which I mean not only his geographical placing, but also the relative efficiency of his aerial and earth system.

But we are confident that the "Cosmic" has sufficient reserves to bear up against a fair percentage of failings due to the faults in class (b) and (c), although there must inevitably remain a residue of constructors who will find their "Cosmics" unable to do all that they believe they ought to.

### For Any Eventuality.

However, we have "something up our sleeves" for these. (Some of you may be inclined to rate us for not telling you everything at the beginning, but we did not do this because for many the following will be quite unnecessary, and its early publication would have made you think that the "Cosmic" is a finicky set that needs to be experimented with before it will give good results.)

### NO CONCRETE COMPROMISES HAVE BEEN MADE IN THE "COSMIC."

Actually it is the other way about. The "Cosmic" is extremely flexible, and it was our several months of experimenting with the circuit that enables us, and you, to be prepared for almost any eventuality!

Those many readers who have "Cosmics" working to their present full satisfaction should at this juncture cease reading my

article lest what I am going to say implants in them the seeds of suspicion, doubt and discontent.

It is so easy, even if you have the biggest and most efficient set in the world, to imagine that you could get better results—that is, if you can make no clear-cut comparisons or scientific measurements to convince yourself that you have attained something approaching perfection.

The "Cosmic" is a Detector-2 L.F. set and you are not doing it justice if you mentally compare the results it gives, say, on medium waves, with an S.G. set or a super-heterodyne.

Compare its over-all qualities with anything you like. Take its simplicity in construction, operation and maintenance, and its three-band effectiveness, and then compare it with any other tri-band instrument, or with any two-band Det.-L.F. receiver for that matter—they are your fair bases of comparison.

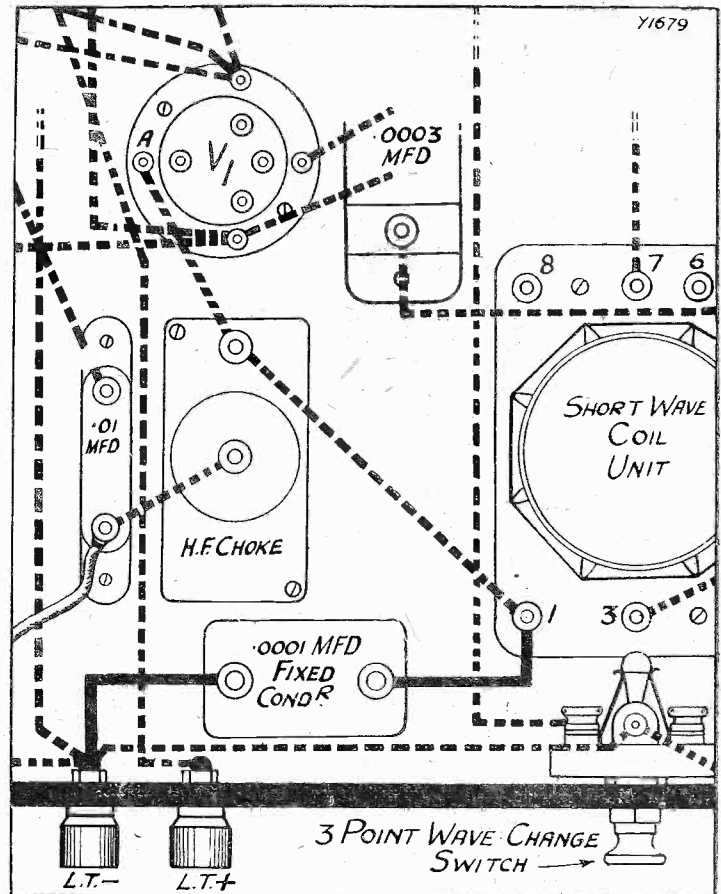
I think these will force all to agree that the "Cosmic" is an outstanding production.

But now for those who have good reason

to believe they are not getting the results they should be getting.

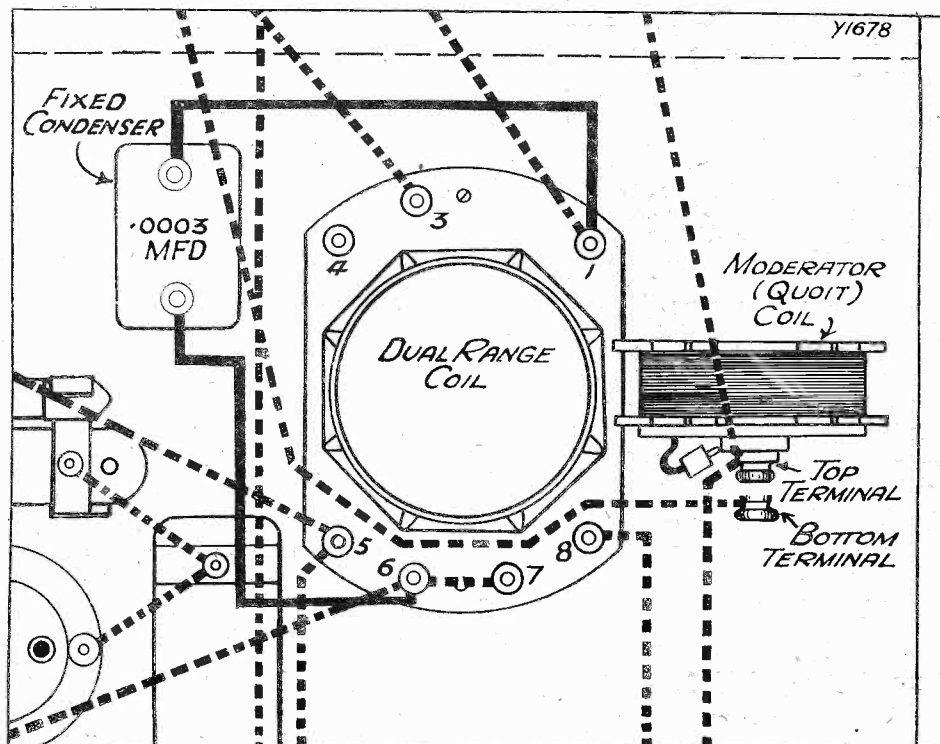
It has been said several times in preceding articles that selectivity and power are under

### IS YOUR REACTION SMOOTH?



Although this .0001-mfd. fixed condenser will, in some instances, add power and improve the reaction of a "sub-standard" "Cosmic," it is only fair to say that it is liable to increase the minimum tuning on short waves by a matter of, perhaps, seven or eight metres.

### DEALING WITH ABNORMAL BREAK-THROUGH



By inserting a small fixed condenser as shown it is possible to eliminate the last traces of "break-through" even in abnormally bad cases.

the constructor's control in the "Cosmic," and that no concrete compromises have been made.

### Moderator Coil's Position.

Well, both factors can be adjusted within wide limits by means of the Moderator control. But if, because of some component or other failing, your selectivity or volume is not what it should be, you can extend those limits even further by varying the position of the Moderator coil relatively with the dual-range coil.

### SELECTIVITY AND POWER ARE UNDER YOUR CON- TROL WITH THE "P.W." "COSMIC" THREE

There is a certain amount of magnetic coupling between these two coils. If it is strengthened selectivity will decrease and power increase, and if it is weakened the reverse will happen—up will go the power and down will go the selectivity.

You can easily test this yourselves. Just remove the screw or screws which anchor the little Moderator coil to the base-board and, taking care not to pull the leads off it, move it about a little.

(Continued on next page.)



## SELECTIVITY AND POWER ON YOUR "COSMIC."

(Continued from previous page.)

There are two diagrams accompanying this article which very clearly illustrate the way you should do this. But don't feel everything is not as it should be because you are unable to maintain the greatest power without insensitivity robbing this of its value.

It is an absolutely fundamental principal that you cannot retain the same degree of power, and increase and keep on increasing the selectivity.

As selectivity goes up, volume goes down, and the set which can give every individual listener the best compromise between selectivity and power in his own local conditions is naturally superior to that one which has a fixed relationship between the two qualities.

### "Sweetening" Reaction.

The "Cosmic" is vastly superior to the majority of Det.-2 L.F.'s in this respect, because you can keep on extending the range of its selectivity-power adjustment without the set becoming a mere laboratory for unpractised research.

The power may, in certain circumstances, be stepped-up quite a bit by connecting a .0001-mfd. fixed condenser between the anode terminal of the detector valve and L.T.—. This will also have the effect of "sweetening" a reaction that is otherwise a bit rough on medium or short waves.

The little component costs only a few pence, and it can be wired in circuit in a matter of moments, so we are not perturbed at the thought that many readers will, as a

matter of interest, wish to try the expedient, even though, in actual fact, their sets do not demand the addition.

There is a coil fault which produces what is known as bad "break through." That is to say, one of the medium-wave local stations tends to swamp in on the long-wave dial readings—particularly on the lower ones.

Happily there is a most effective cure for this. You obtain a .0003-mfd. fixed condenser and join it up in the manner illustrated by a further diagram.

You will then find that the "break through" will be limited to only a very small part of the Moderator adjustment.

Now I must make it clear that the above simple and interesting experiments will not offset any and every failing; the most which can be said for them is, I repeat, that they serve to increase the flexibility of the set and enable you to "hot" up the outfit to abnormal limits of the power and selectivity obtainable with a detector-2 L.F. set.

### Those Hidden Faults.

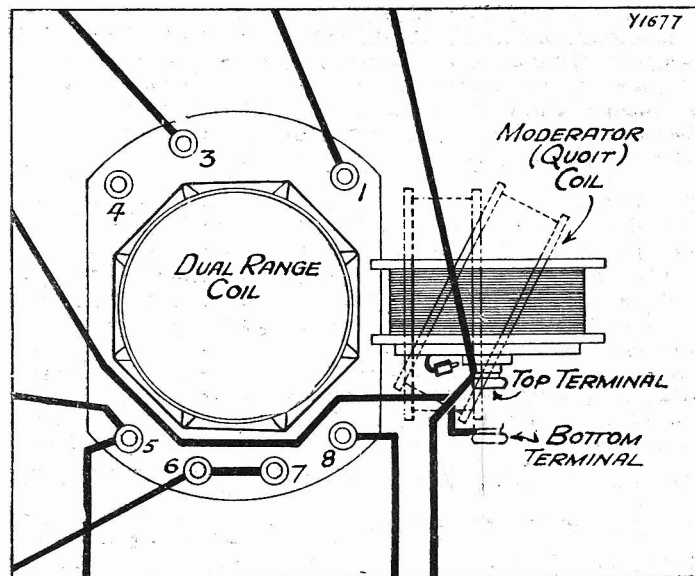
Battery, valve, aerial and component failures must be remedied, if such exist, before you can hope to obtain the results

given by a similar set operating under healthy conditions.

I say this feelingly, because it so often happens that a constructor writes critically of the performance of a set which, after investigation, is found to be working under a handicap of the above variety.

"Your so-and-so three- (or four- or five-)

## AN "INFINITELY-VARIABLE" ADJUSTMENT



You can extend the limits of the power-selectivity compromise, and obtain any intermediate degree by adjusting the position of the Moderator coil, as shown above.

valver is a dud," they write, whereas what they should really say is something like this: "Your so-and-so is not working properly because of some fault which I am unable to trace." Many do address our Query Department with such words, as I am bound to admit.

However, there are, so far, very few of the tens of thousands of "Cosmicites" who have to write at all in such a vein; fewer than with any previous "P.W." set, I think, and that is saying a great deal in view of the enormous success already achieved by the "Cosmic."

But I have received a number of letters asking questions of general interest regarding the "Cosmic" in action, and these I propose to answer as best I can in an article entitled "'Cosmic' Queries," which will appear in an early issue of "P.W."

## TIPS FOR TESTING

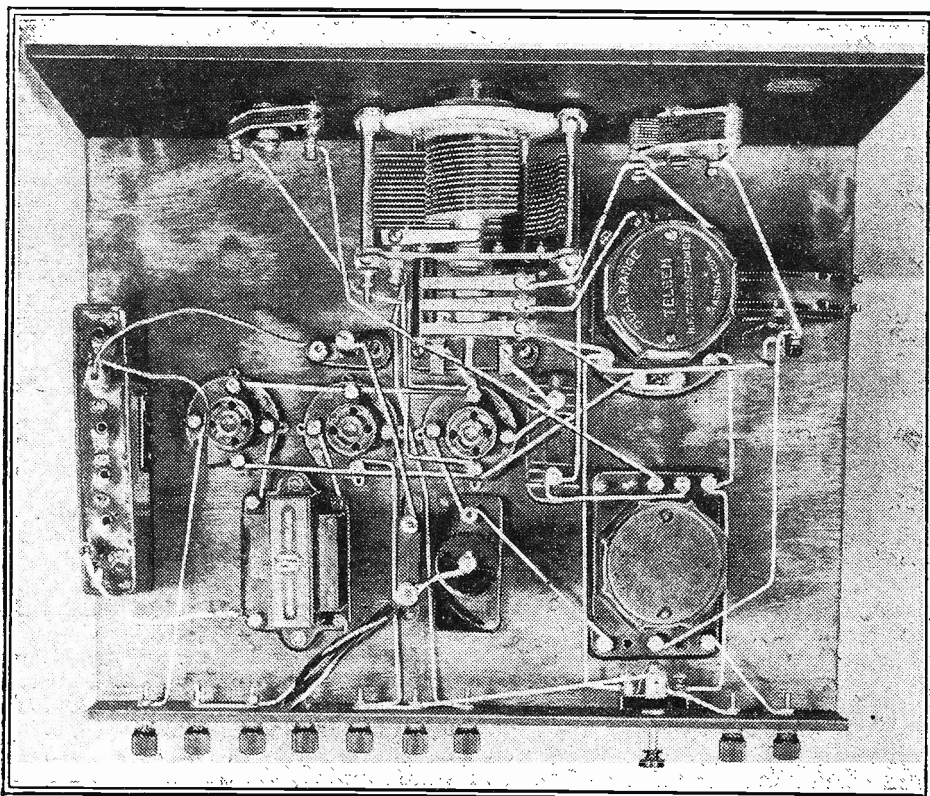
Some reminders for the radio fault-finder.

When a fault such as weak or noisy reception is confined to one wave-band, special attention should be given to the wave-change switch and its wiring.

When reception falls off, a good rough-and-ready test is to tap the detector's grid terminal with the finger. (If there is no loud response to this in the loudspeaker, the fault is on the low-frequency side of the set.)

Radio-gram users should remember that when a set fails on radio reception, the mere switching over to the gramophone will show whether or not the fault is on the low-frequency side.

## A SET FOR THE DISCRIMINATING CONSTRUCTOR



There is no "take it or leave it" about the "Cosmic," as you will be able to see by the accompanying article. If you don't at first obtain its full efficiency, we show you how to go out and get it.

## THOSE SUNDAY PROGRAMMES

Some more about the "Improved" Sunday-programmes rumour that was recently given prominence in the Press, and other interesting radio topics of the week.

**R**EADERS of a certain issue of an evening newspaper a few days ago must have had a pleasant shock, for therein it was announced in big type that important decisions for the brightening of the B.B.C.'s Sunday wireless programmes had been reached.

### A Special Director!

The details concerning the ways and means by which the Sunday programmes were to be brightened were numerous and convincing and, according to the Wireless Correspondent of the journal in question, the B.B.C. had decided that, although the character of the Sunday programmes might not be changed drastically, their quality should be improved.

In order to achieve this, it was reported that a Director of Sunday Programmes was to be appointed. The new Director would work under Mr. Roger Eckersley, the present Director of Programmes, and make the Sunday programmes the best of the week.

### Debates, Too!

For instance, there was to be more regular use of the Gershwin Parkington Quintet—rarely heard on Sundays—and "of that form of bright light orchestral music which Joseph Lewis features in the week-day programmes."

Further, it was reported that Sir John Reith had decided to see the best talk of the week incorporated in the Sunday programmes. It appears that the talk need not have been necessarily on a religious subject, as long as it was superior to any other broadcast on a Sunday.

Another innovation which was included in this wonderful programme of brightening Sunday radio was that four-handed debates were to be introduced—such as "On the 9.20 Train" series, which are one of the bright spots in the Saturday evening broadcasts.

### An Exciting Item.

Although the Epilogue was not to be affected, one religious service was to be broadcast on Sundays, and on only one wave-length instead of two.

The most exciting item in this report was

that Henry Hall, the new Dance Band Director, might possibly be allowed to include dance music in Sunday programmes if he could demonstrate to the satisfaction of the authorities that he could play suitable dance music—that is, suitable for the Sunday atmosphere so carefully cherished at Savoy Hill. The idea, apparently, was that Henry Hall might be allowed to play old-fashioned waltz music, slow fox-trots, and sort of "Home Sweet Home" airs with a dance rhythm. And so on.

### Too Good to be True!

In fact, a most heartening but, at the same time, a most surprising account of the B.B.C.'s decision to revise its Sunday

at Savoy Hill yesterday I was informed by a responsible B.B.C. official that the news of the appointment of a Sunday Director of programmes and of a revision of the Sunday policy of programmes was quite unfounded."

In short, the evening newspaper in question had allowed its wireless correspondent to become so inspired with the feeling that something must be done about the Sunday programmes, that all the wonderful things which were to be done on Sundays—a few of which we have mentioned above—emanated from anywhere except Savoy Hill!

I was never more disappointed in my life to see this denial from Savoy Hill in print. Oh, if it had only been true, and if that brave decision had been made to do something about cheering up Sunday programmes!

### General Ferrié.

A great wireless expert died the other day. He was General Ferrié, the Head of the Signalling Service of the French Army. He died after an operation for appendicitis at the comparatively early age of sixty-three.

In the early days of POPULAR WIRELESS

General Ferrié was courteous enough to arrange a test demonstration on our behalf from the Eiffel Tower, and kindly wrote to the paper afterwards with reference to the experiment.

In 1898, having seen some of Marconi's early experiments, General Ferrié became greatly interested in radio and, independently of others, he invented the electrolytic detector. He organised the first Radio Telegraph Service in the French Colonies, and will always be remembered in France as the man who made the French army realise the tremendous importance of wireless communication.

### A Pioneer.

It was over 34 years ago that he first proposed to the French authorities that wireless should be specially studied from the military standpoint. He was the man who established the first army transmitting post.

During the War he did great service to the Allies as Chief of the Army Wireless Stations. He controlled the Eiffel Tower wireless station, and carried out many improvements there.

He was the originator of the historic broadcast when the American Telephone and Telegraph Company transmitted the first wireless telephone message across the Atlantic in 1915. In 1923 he was awarded the Franklin Medal in recognition of his good services, and in 1929 he was made a General in the French Army for life.

## ARE YOU BUILDING A "COSMIC"?

### YOU CANNOT AFFORD TO MISS THE SET OF THE YEAR.

**R**EADERS of "P.W." will have noted the details of the "Cosmic III," given in our issue for February 13th, and of the "Cosmic Star," given in our issue for February 20th, and will have probably decided which version of this famous set they intend to build.

We urge them not to delay—build your "Cosmic" NOW, and don't miss any longer the pleasure of owning and operating the Best Set of The Year.

Thousands of readers have already built or purchased "Cosmic" sets, and so great has been the demand for details of the "Cosmic Star" that already over 293,000 copies of the issue of "P.W." for February 20th have been sold.

You can judge how the "Cosmic" has attained enormous popularity in an amazingly short time by reading the following letter from one of our leading advertisers.

**READY RADIO, Ltd.,**

Eastnor House,

Blackheath, London, S.E.3.

February 23rd, 1932.

Dear Sir,—I think you may be interested to know that our experience this season has

confirmed me in my belief in POPULAR WIRELESS as the most effective weekly advertising medium.

No doubt the fact that "P.W.'s" circulation holds the record has much to do with this, but I think due credit must be given to a bold Editorial policy and to the class of reader to whom the paper appeals.

The response to our advertising on the "Cosmic Star" Receiver has been sufficient in itself to establish the pre-eminence of POPULAR WIRELESS and the loyalty of its readers.

Yours faithfully,

For **READY RADIO, Ltd.**

(Sd.) **IVOR W. E. HUSTLER,**

Managing Director.

Remember, "P.W." sets have an unrivalled reputation—a fact which is chiefly responsible for "P.W.'s" equally unrivalled circulation—a circulation guaranteed by a Chartered Accountant's Net Sales certificate, and unapproached by any other wireless paper in the world.

programme policy. As one read on, one was convinced that at last something had been done at Savoy Hill to bow to public demand, and that at last some of the old-maidenish atmosphere was to be dispelled from Savoy Hill on Sundays.

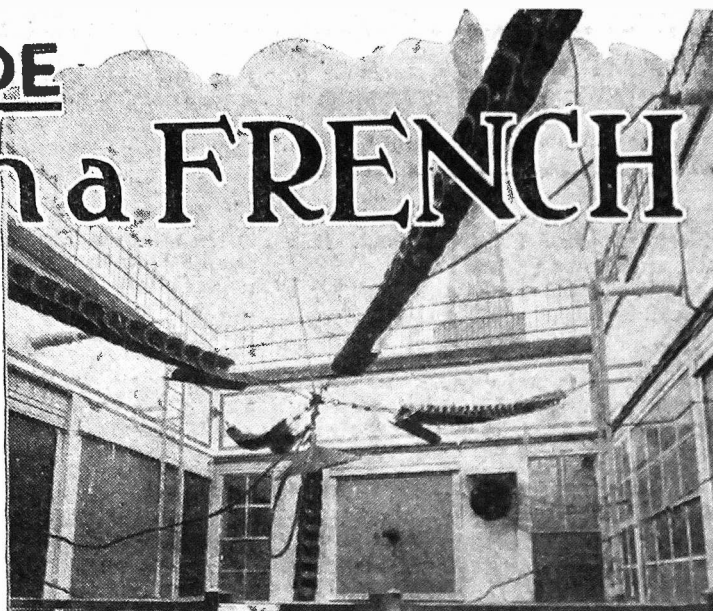
Alas and alack! The sequel to this amazing and exciting account occurred the very next morning when the "Daily Telegraph" published the following:

"It was reported yesterday (not in the 'Daily Telegraph') that a special Sunday Director of B.B.C. Programmes was to be appointed in a month's time, and that in future listeners to the Sunday programmes would hear plays, talks, lighter music, and possibly dance-band music. On enquiry



# ON THE OTHER SIDE A TALK with a FRENCH LISTENER

Following the fascinating accounts of radio, as seen by a Russian, an Italian, and a German, here is a conversation between a French and a British listener which will help you to understand reception conditions on the other side of the Channel.



**S**IPPING a cognac coffee to the strains of a café loudspeaker giving out the Radio-Paris programme, Lacroix, of a well-known trading company, gave me a good idea of the French amateur's viewpoint.

I told him of the popular British belief that French stations are the worst offenders in not sticking to their wave-lengths.

"It's all very well to suggest that our stations wander about in wave-length just to suit themselves," he said, aggrieved.

## Changing the Wave-length.

"Engineers at a station do not change the tuning just for the fun of the thing. What happens is that during the course of a programme several listeners 'phone up frantically to the station and beg that the wave-length be shifted a trifle to avoid heterodyning with some German or Spanish station which, in altering a trifle in its wave-length, has set up a howl.

"What can the engineers do but agree, even if it means getting a little closer to some British station? We blame Great Britain to a large extent in taking the lion's share of the wave-lengths.

"Radio-Paris is working with 85 kilowatts and may be causing interference with 5 X X, but it has, anyway, a programme of its own; whereas your 5 X X is only a relay of what we over here can hear on five or six so-called National wave-lengths on the medium-wave band. That hardly seems fair to us, and it is still more unfair to blame our authorities for altering the wave-lengths to get a clear field.

## Internal Friction.

"Alors, if the trouble between independent interests and the State could be cured there would not be the need for so many stations. The independent interests blame the P. T. T. for being narrow-minded and, in your British phraseology, red-taped.

"The P. T. T. insists that it must have control of all broadcasts. Between these big conflicting bodies we are no better off than are you British listeners who grumble at station-jamming by our transmitters.

"We do not get anything like the same programme service as you do, especially as Radio-Paris, with a mainly English programme, is the chief radio entertainment here in Paris. There is a strong feeling that

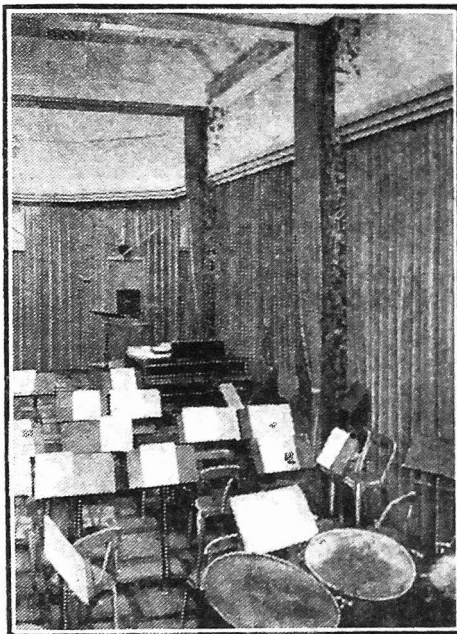
the B.B.C. could give up a few wave-lengths to our stations and feel none the worse for it."

Wisely, I changed the subject and talked about licences.

## Complicated Licence Scheme.

"Ah, that is rather involved!" he said. "We all have to pay a licence fee of one franc per year—practically nothing, you might say. This is paid to what is known as the *Contributions Indirectes*, and we have to take the fee to some local centre, just as

## A RADIO-PARIS STUDIO



Here is a general view of the big Radio-Paris studio opened not long ago in the Champs Elysées.

you English people pay your rates. Motor-car licences are paid in this way, too.

"This isn't all. There is a luxury tax of 12 per cent. on sets which cost more than 500 francs, and on parts costing more than 50 francs. And, although our gear is cheap, one does not get very much of an outfit for 2,000 francs.

"Foreigners have to pay an additional tax of 10 francs a year, and down on the

Riviera this tax results in quite a considerable income to the licensing authorities because there are many British and American visitors with portable sets.

"There is a long-standing conflict between private broadcasting authorities and the State. It would be a jolly good thing if this quarrel could be settled.

"There are one or two stations working without any licence at all, in open defiance of the law.

"I can quite understand that on good evenings these may cause interference with you British listeners, in spite of the fact that the power is only a small fraction of a kilowatt.

## Censoring the Programmes.

"Our *Sûreté Générale* (secret police) are supposed to spot broadcasting stations and, working hand in hand with the Ministry of Postes, Telegraphs and Telephones, these two bodies control all ordinary broadcasting.

"Apart from actually tracking down stations, the *Sûreté Générale* keep a watch on programmes and stop such things as *risque* stories and the broadcasting of false stock market reports which would affect share values.

"Both these things caused a little trouble a few years ago when there was no censorship, and self-respecting Parisians made representations to the *Sûreté Générale* because they felt that, with the immense range of the French long-waves, this kind of thing would cause a bad impression throughout the world.

## The Government Stations.

"The Government itself has eleven stations. These are the Eiffel Tower, Lille, Rennes, Limoges, Bordeaux, Toulouse-Pyrenees, Montpellier, Marseilles, Superior School of Ministry of Postes, Telegraphs and Telephones in Paris, Grenoble and Lyons."

"I have heard the term C.F.R.," I said. "What does that mean?"

"The big corporation, The Compagnie Generale T.S.F., controls two other companies, Compagnie Francaise de Radiophonie and Radio-France. Radio-France runs commercial stations, the other one running broadcasting stations in competition with the State.

"This Corporation is popularly known (Continued on next page.)

## A TALK WITH A FRENCH LISTENER

(Continued from previous page.)

as C.F.R., and these letters are just as significant as your B.B.C. in England. It is C.F.R. which runs Radio-Paris."

"That's a bone of contention, eh?" I remarked.

### A Sore Point.

"Radio-Paris is probably the most heard station in and around Paris, but, speaking rankly, it is not the most popular station.

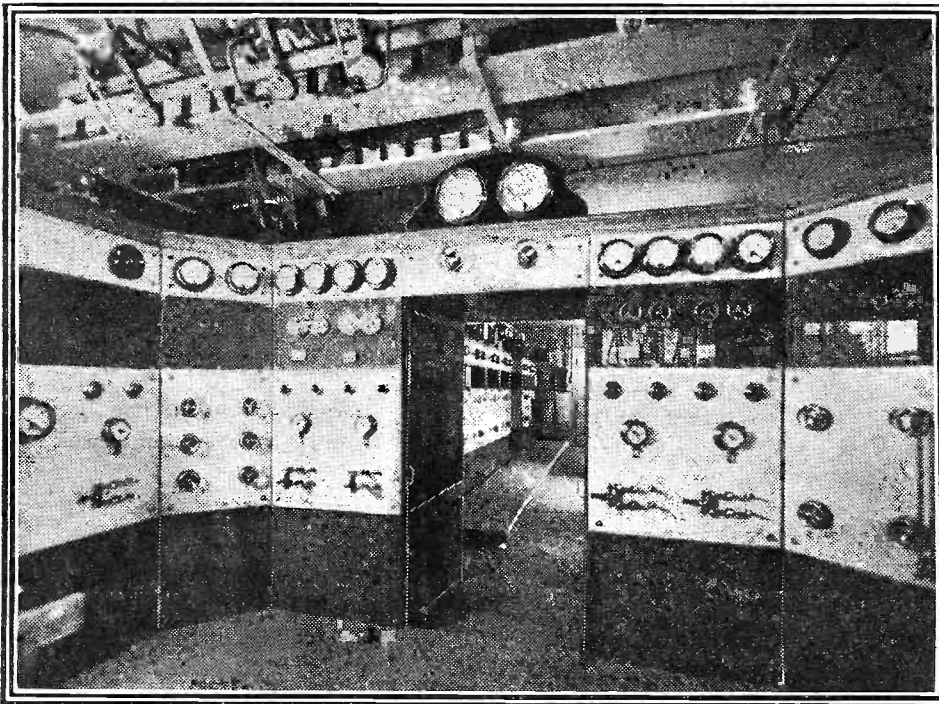
"In our opinion, the B.B.C. news service is nothing like so good as our *Journal Parlé*, because it is so impartial and there is nothing human about it. Nevertheless, Daventry's weather reports and news bulletins are of vital interest to us.

### Useful Bulletins.

"We not only can tell what the weather in the future is going to be like, when the squalls blow over from the Atlantic and reach the British Isles before they do Paris, but we can tell from British news what political events of importance will take place.

"Of course, we Radio-Paris listeners get a news bulletin long in advance of the first B.B.C. news bulletin.

## EIFFEL TOWER'S UNDERGROUND TRANSMITTER



This picture provides an interesting glimpse into the famous Eiffel Tower Station, which is located in the gardens around the base of the huge structure from which it takes its name. Broadcasting is only one of its functions, the equipment being Government-controlled.

"You see, it is too English. The average Parisian is a patriotic fellow who reads his daily papers during *l'heure apéritif* on the boulevards, and imagines that every one of your British Chancellors of the Exchequer is out to steal his francs. He has no violent anti-British feeling, but he has a secret dislike of too much anglicisation and Americanisation of French things.

"The idea of Radio-Paris and Toulouse running special programmes for British listeners is just as galling to him as though your Brookmans Park devoted evenings to Wagner in order to please German listeners, and gave the announcements in German! He dislikes the English announcements from Radio-Paris.

### Long Waves Very Popular.

"In spite of this, most sets within range of the C.F.R. station are tuned to 1,725 metres practically every morning, for there is nothing much else on.

"And in the evenings, too, when the Eiffel Tower station's programme is not too bright, you will find the average Parisian tuned in to Radio-Paris or 5 X X. Your Daventry comes in very well, despite its distance.

Practically every day there is an exchange and news report at one o'clock. Other bulletins of the same kind are given on most days at six o'clock, followed by an agricultural bulletin for farmers, at 7.45 and 9.15 in the evening.

[Ed. NOTE.—The next article in this exclusive "P.W." series will be "A Talk with a Spanish Listener."]

## MAKING MITRE JOINTS

Some Useful Hints for the Cabinet Maker.

THIS type of joint is used quite a lot in wireless cabinets. The correct method of making the joint consists in first marking out the angle to be sawn—a

square can be purchased which includes the necessary angle, 45 degrees, in its construction.

The gauge is placed on the wood to be sawn as shown, and carefully marked with a hard pencil or a steel scriber. Accuracy in marking and sawing is very essential.

The wood is then placed on the bench hook and cut very carefully with the tenon saw. When using the saw, try to keep it in an upright position, or the mitre will suffer. R.T.

## THE ECKERSLEY TUNER IN MANCHESTER

A reader finds it rejuvenates the "Comet."

The Editor, POPULAR WIRELESS.

Dear Sir,—May I take this opportunity of congratulating Captain Eckersley on the performance of the "Comet" revised by the inclusion of an Eckersley coil. I have handled a number of the "P.W." sets—especially Detector and 2 L.F.'s—but this last set is greatly ahead of all the others on the grounds of selectivity, sensitivity and volume.

The important and surprising feature of the Eckersley set is its wonderful selectivity; surprising because it only consists of a Det. and 2 L.F.'s, which generally is not too closely associated with selectivity. Situated in Manchester, 18 miles from Moor-side Edge (North Regional), Rome can be obtained free from North Regional. Midland Regional, which seems to be peculiarly inconsistent in this district, is easily obtainable, free from all interference. A host of stations can be obtained, including Toulouse, Mühlacker, Strasbourg, Hamburg, Frankfurt, Vienna, Brussels and London Regional. I have been unable to test the band below London Regional satisfactorily, as I have not been able to procure a series aerial condenser with shorting pin. Consequently the above results are the more remarkable as no extra selectivity device has been introduced.

### On the Long Waves.

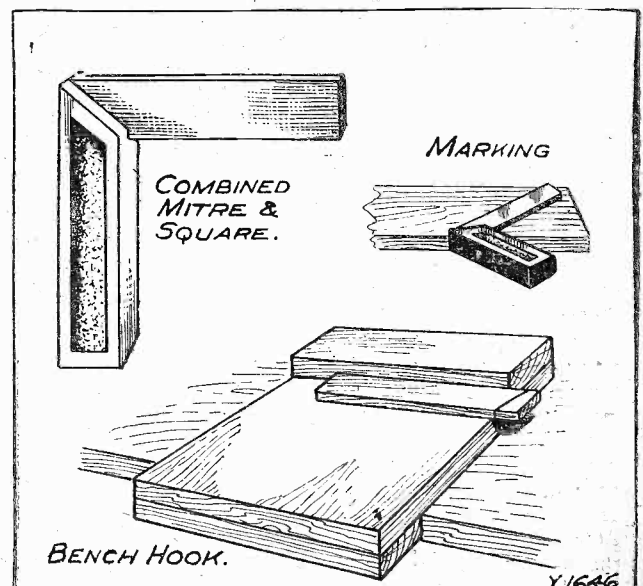
The performance on the long waves is also exceptional, being a distinct improvement on the "Comet." Nine stations are received on the speaker—Radio Paris, Königswusterhausen, and 5 X X all being obtained free from one another.

In view of these results it seems peculiar that the Manchester dealers should be so prejudiced against the set. It is a matter of considerable difficulty to obtain the parts for the set—the series aerial condenser panel type being unobtainable in Manchester.

Every one of the claims made by the inventor can be substantiated and the set thoroughly recommended to all readers, especially those who are situated near to a powerful regional station.

Yours sincerely,  
S. BARRATT.

## THOSE TRICKY CORNERS



In the accompanying short article the best method of making mitre joints is concisely explained.



# CAPT. ECKERSLEY'S QUERY CORNER



Under the above title, week by week, our Chief Radio Consultant comments upon radio queries submitted by "P.W." readers.

Don't address your letters direct to Capt. Eekersley; a selection of those received by the Query Department in the ordinary way will be answered by him.

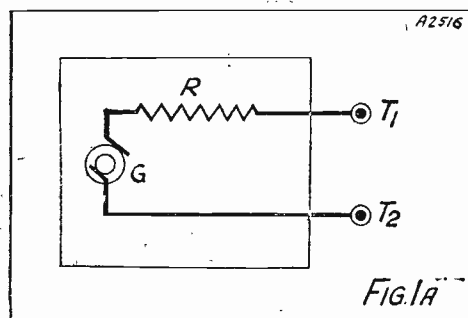
## Using a Tapped Choke with a Pentode.

C. E. T. (Leeds).—"Why is it that when using a pentode I find that altering the position of the tapping point on my tapped output choke gives me a definite variation in quality? Yet, if I use a tapped output choke with an ordinary power valve no difference in quality is noticeable?"

It would help a great many people if they drew a valve as a generator of current, voltage and variable frequency in series with a large resistance, which for rough purposes can be the value of what many people call the "valve impedance," as shown in my sketch.

G is the generator and R the resistance (Fig. 1A) and this is equivalent to the valve with anode impedance Z (Fig. 1B), the output terminals being  $T_1$  and  $T_2$ .

## THE VALVE AS A GENERATOR



Our Chief Radio Consultant explains to a Leeds reader that the valve should be considered as the equivalent of the factors inside the square—a generator of variable frequency in series with a resistance.

Now if you connect a loudspeaker between  $T_1$  and  $T_2$  and run the frequency down from 10,000 to 50 cycles, the voltage across  $T_1$  and  $T_2$  will fall as often as the frequency gets below some figure—between 1,000 (say) or 100 (say).

Why? Because the loudspeaker impedance is lower the lower the frequency, therefore it wants to take more current—but the resistance R prevents the current rising, so the voltage across  $T_1$  and  $T_2$  gets less as the frequency of the generator is lower and as the resistance R is bigger.

Now the resistance R (or the internal impedance) of a pentode is very high, and the volts output therefore falls very rapidly as the frequency is decreased below, say, 2,000. That is why, to prevent this effect the pentode has to be used with an auto-transformer (or transformer), which makes the current output for given load less.

So if you ask the valve to supply more current by tapping up the transformer, you must lose bass, because the loudspeaker wants more current, and the resistance R prevents it.

## Inside the H.T. Battery.

D. T. (Kennington).—"I recently pulled an old H.T. battery to pieces, and found that in some cells the zinc casing was covered by a white paste, whereas the others were quite clean.

"Why is it that some cells should break out in this way and not the others?"

Which link of a chain will break when an apparently uniform chain is subjected to the same increasing pull? One doesn't know why such and such a link goes first; one can only say the forging was not so good, that there was not quite the same uniformity in the metal, and so on.

Just the same way in a battery of many cells: some "go" before the others because they weren't quite so well made, etc., etc. Someone's got to give way first!

## Overloading a Transformer.

A. J. B. (Kettering).—"I am using in my set a mains transformer for the filament supply designed to give 4 volts, 2 amps. I have been taking 4 amps. for a considerable time, and the transformer is still O.K. Is it usual for manufacturers to work with such a large safety factor, or will any mains transformer do this?"

It is not usual to be able to work a transformer at twice its power rating. If you were buying a 10,000 kilovolt-ampere transformer, you would not find it would stand up to a double overload! But in very small power work you can afford—in fact, you sometimes must afford—to have a larger factor of safety than when big powers are considerable.

I should think, however, you would risk some danger in burning out the transformer, using it as you do. Feel it after an hour's working. Is it too hot to bear your finger on it?

If it is, it won't last long. If it isn't, it may carry on for a bit.

## ONLY IN "P.W."

can you read Capt. Eekersley's replies to listeners' own problems.

## AND REMEMBER—

Captain Eekersley's technical articles appear only in

"POPULAR WIRELESS" and "MODERN WIRELESS"

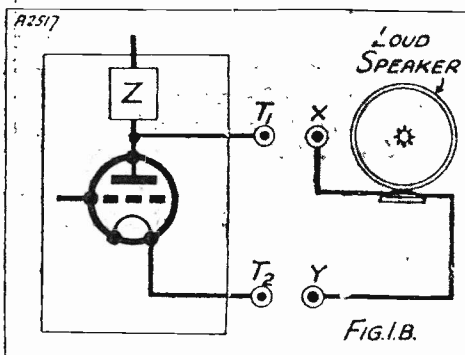
## The Effect of Filtering the Loudspeaker Currents.

R. P. B. (Chelsea).—"It is often recommended to employ a choke output filter to keep the anode current of the last valve from flowing through the speaker windings.

Is it, however, altogether beneficial to do this? Would it not be better to let the speaker windings carry current in the right direction with a view to preventing loss of magnetism in the permanent magnets? I refer, of course, to the case of a moving-iron loudspeaker."

Other things being equal, you have a given flux exerting a given pull on the

## VOLTS ACROSS THE LOUDSPEAKER



Here is a typical output circuit, as referred to in the reply to the first question. If a pentode is used instead of a 3-electrode valve the voltage drop across  $T_1$ ,  $T_2$  is accentuated as explained.

armature, and you add and subtract flux, and hence you add and subtract pull on the armature.

Whatever the value of the initial flux, and provided its pull is balanced by the counter-pull of the armature, the additions and subtractions of flux will give a resulting change independent of the initial pull.

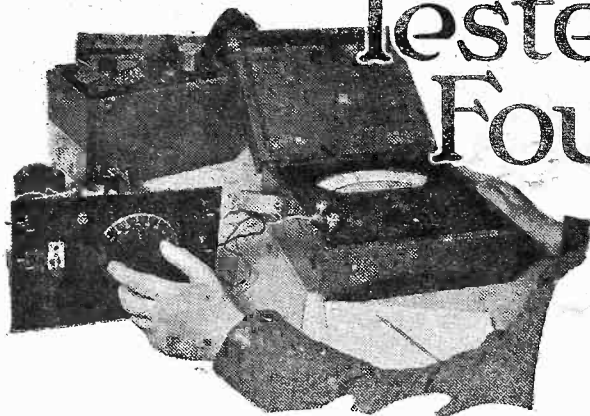
Let  $Pf$  = flux pull and  $Pa$  the armature pull in a quiescent state, and  $p$  the extra pull due to A.C. currents. Then  $Pf - Pa + p$  and  $Pf - Pa - p$  are equal to  $+$  or  $- p$  if  $Pf = Pa$ . But it is an integral part of the design to give  $Pf$  and  $Pa$  special values.

The only object in not allowing current to flow in the windings is to maintain this condition. Many speakers will not be affected by the increase of  $Pf$ , but it is on the whole advisable not greatly to upset the given conditions.

Besides, it's bad practice to let the H.T. get on to the speaker, isn't it?

## FROM THE TECHNICAL EDITOR'S NOTE BOOK.

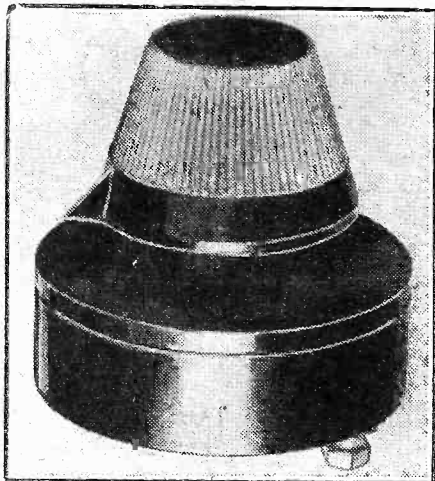
# Tested and Found-?



## THE READIRAD VOLUME CONTROL.

VOLUME controls of the potentiometer type have not always been universally satisfactory articles. They aren't even to-day. And it is not always possible to gauge the efficiency or otherwise of such a device until it has been in use for some time.

## A GOOD COMPONENT



A good movement and a completely protected resistance element are features of the Readirad L.F. Volume Control.

The most usual troubles encountered are contact failures and an upset in the resistance element value.

The first may make itself very noticeable in an erratic variation as the component is adjusted. But the second is much more insidious in its effects if it is not accompanied by the first.

A bad fault of this nature can seriously throw the set off its performance without it being obvious to the inexpert that the volume control is to blame, for there may still be a smooth control in regard to relative volume.

But a freedom from this sort of thing is guaranteed in the Readirad Volume Control by a special method of construction. The resistance element is completely sealed up and contact is made to it through a series of small stud affairs.

Thus two ends are served, for there is also an effective contact and no wear imposed on the resistance element in the process.

The action is particularly gratifying; it is smooth, even and positive. And the

construction of the component is on entirely sound lines.

Its resistance is 500,000 ohms, and the price 5s. 9d.

## A NEW LISSEN LINE.

Messrs. Lissen, Ltd., have sent me preliminary details of their new Dual-Range Shielded Coil. And from these advance details it would seem that it is a very interesting component. When my samples arrive I will be in a position to tell you more about it.

## "AKROS."

Flexible cords such as are usually used for loudspeaker and mains unit leads generally comprise two rubber-covered wires in a tubular fabric sheathing. To preserve a neat, round shape, cotton filling is provided.

It is this filling or padding which tends to make it difficult for constructors to fashion a tidy joint when such material has to be cut to a length.

Also, it is not a completely satisfactory method, inasmuch as the cotton readily absorbs moisture.

Therefore, its elimination is most desirable, and Messrs. Ward & Goldstone, Ltd., accomplish this in their new "Akros" by making each rubber-covered wire semi-circular in shape.

The fabric sheathing then fits snugly, and an entirely satisfactory result is achieved.

"Akros" costs little more than ordinary connecting cord, and is available in a useful range of gauges and finishes.

## WORTH SENDING FOR.

The pamphlet dealing with the Permanent Magnet Moving-Coil "Motor" Speaker, published by the Tekade Radio & Electric Co., Ltd., should be in all constructor's hands.

## GIVE YOUR ADDRESS.

It is pointed out that many people write to radio manufacturers for catalogues, etc.,

and don't give their full addresses. We are asked to request our readers to make sure that they do not omit such vital information.

## THE H.S.W. SHORT-WAVE ADAPTOR.

Messrs. Hustler, Simpson & Webb are marketing a short-wave adaptor, completely assembled in a solid oak cabinet, at 35s. The coils cover a 15-100-metre wave-band.

## THE "AMAZING" THREE.

I have just received a complete kit of parts for building up a Graham Farish "Amazing" Three set.

It is a Detector-2 L.F. receiver, and it

## PLEASE NOTE.

Manufacturers and traders are invited to submit radio apparatus of any kind for review purposes. All examinations and tests are carried out in the "P.W." Technical Department with the strictest of impartiality, under the personal supervision of the Technical Editor.

We should like to point out that we prefer to receive production samples picked from stock, and that we cannot, in any circumstances, undertake to return them, as it is our practice thoroughly to dissect much of the gear in the course of our investigations!

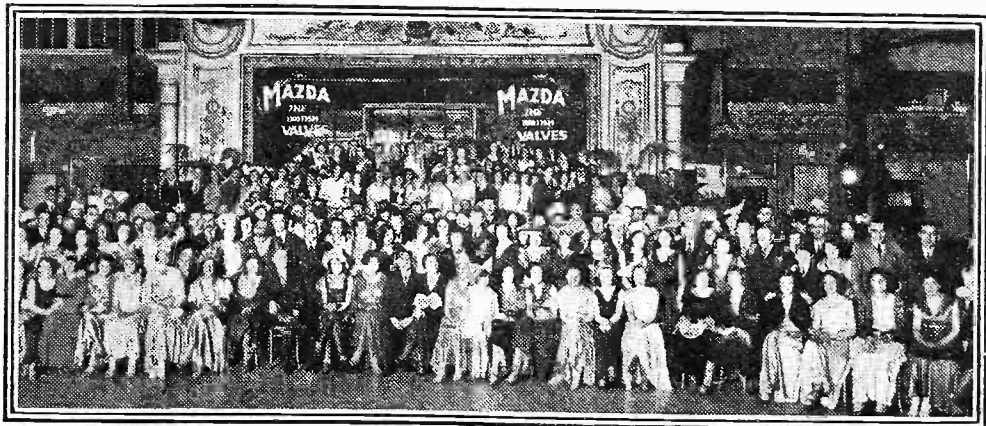
And readers should note that the subsequent reports appearing on this page are intended as guides to buyers, and are, therefore, framed up in a readily readable manner free from technicalities unnecessary for that immediate purpose.

retails at the very low price of 38s. 6d. Among the special features in it are a screened coil of special design; a moulded bakelite panel having all scales, markings, and indications engraved on it; a moulded bakelite "well" chassis, with position for each component engraved and, as with the panel, all fixing holes drilled.

It does seem to be a very nice job, and it is apparent that thought and imagination have been put into the design. The designers have visualised the needs and special requirements of constructors and have arranged the layout, etc., accordingly.

During the week I will be testing this "Amazing" Three, and shortly—perhaps in the next issue—a report on its performance will probably appear.

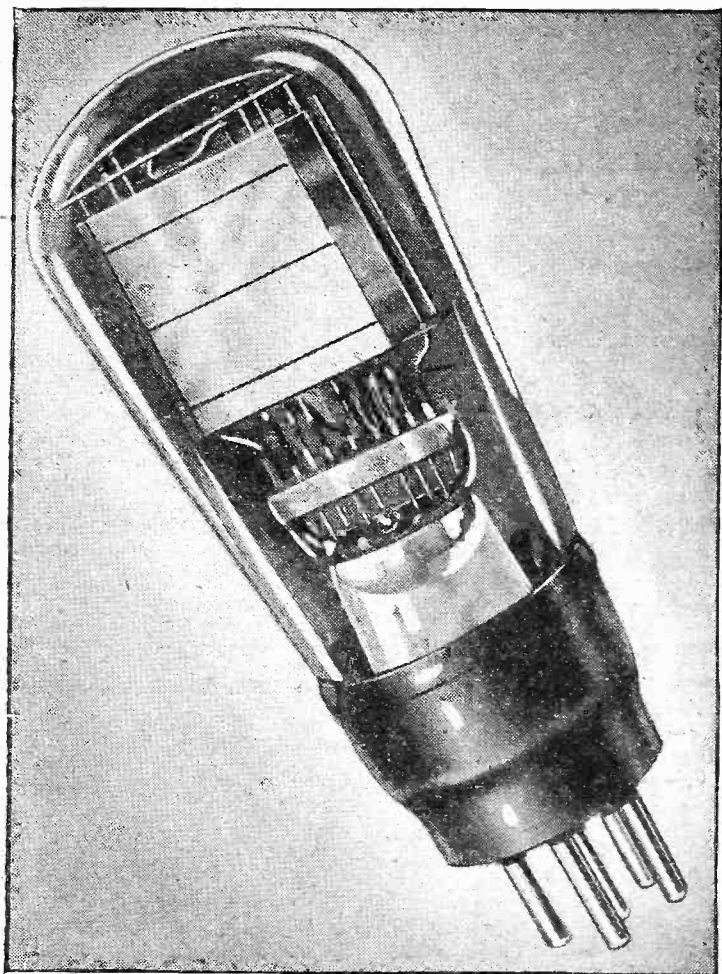
## AT THE SIGN OF THE "MAGIC LAMP"



The Cosmos Social Club gave a dance at the Cosmos Lamp Works and, no doubt, the lighting was as brilliant as the scene was gay! It is at this huge factory that the famous Mazda valves are made.



# THE NEW LOW CONSUMPTION HIGH EFFICIENCY PENTODES



## ★ FOR THE MAN WHO USES BATTERIES PEN 220

Here is the solution to the output stage problem in battery operated receivers. The Mazda Pen 220 gives an astonishingly high undistorted output for an anode current of only 5 m/a. It is the ideal output valve for portables.

**PRICE 20/-**

## ★ FOR THE MAN WHO HAS AN ELIMINATOR PEN 220A

A valve which delivers a huge undistorted power output for an anode current of not more than 18 m/a, the Pen 220A needs only 150 volts on the anode and can be made to give excellent results with 120 volts and a current of only 12 m/a. It is undoubtedly the valve for the man who wants really magnificent volume for the operation of large moving coil speakers.

**PRICE 20/-**

## EDISWAN RADIO

155 Charing Cross Rd., London, W.C.2

Mazda Valves are 100% British made and designed by British engineers.

**The amazing**

# MAZDA THE BRITISH VALVES

The Edison Swan Electric Co. Ltd.



At the present time there is a certain amount of unrest amongst European stations. There is rather a lot of wave-length wandering and listeners are reaping the unpleasant consequences in the large number of heterodynes that they find.

Take the case of Palermo. The wave-length assigned to this station is 542 metres which rightly belongs to Sundsvall. Palermo tried this wave-length for a time, though so far as I can make out he never got *exactly* on to it on any night.

#### More Wave-Length Wandering!

Then he shot down almost on to Riga's wave-length, and since then he has been wandering about at the top of the broadcast band, heterodyning now this station, now that. Another poisonous heterodyne is that which has been caused with Brussels No. 1 by the arrival of a new Russian station which began operations only one kilocycle away.

Bad offenders in the matter of wave-length wandering have been Sair Sebastian in the neighbourhood of 455 metres, the Norwegian relays just below, Radio L.L. (who has heterodyned Hamburg), Radio Vitus (Cardiff has been a sufferer), Radio Lyons and Radio Eiege.

Down below 250 metres wave-length wandering has been worse than I have ever known it. One rather disquieting sign is that there appears to be a big number of unauthorised or experimental stations at

# 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.

work. One may try in vain to obtain the call-sign of many of them, and they seldom use the same wave-length on two consecutive nights.

Representation must have been made by the U.I.R. and it is to be hoped that the governments of the countries concerned will take appropriate action.

Reception on the long waves is particularly good and there is much less heterodyne-trouble up there. Radio-Paris, though, suffers occasionally from the attentions of a station—apparently Russian—working on almost the same wave-length.

Metala has not been up to the mark for a little while and Kalundborg has had periods of curious weakness. Otherwise the long-wave stations are first-rate.

#### Not Very Reliable.

For reasons already given, the bottom of the medium waveband has not been a good hunting ground recently. It is generally worth while to run rather rapidly over the portion between about 220 and 250 metres, for often there is a station or two to be picked up quite clear of interference. But possible heterodynes prevent us from re-

garding any station on these wave-lengths as reliable.

Above 250 metres matters are very much better. Gleiwitz, Toulouse P.T.T., Hørby, Leipzig, Turin, Heilsberg and Bratislava have not suffered at all from interference and all are receivable in normal condition with excellent volume and quality.

I still have not definitely identified Tallinn, though this station, which works on the channel immediately below Hilversum's (299 m.), is shown as having an output power rating of 11 kw. Perhaps readers living in more northerly districts have been luckier.

#### A Few Bright Spots.

Hilversum is particularly good at present and Bordeaux is quite free from interference. Genoa is usually rather mixed up with other stations, but one can occasionally receive him quite free from interference. The same applies to Marseilles.

Goteborg seems to be rather below par, but Breslau is strong and reliable. Working upwards, we have good stations in Brussels No. 2, Brno, Strasbourg and Frankfurt.

Hamburg is good only when you can catch him free from a heterodyne. Katowice is an immense signal and on many sets wipes out Dublin on the one side and Sottens on the other. Toulouse Midi is generally very good and I can record splendid reception from Lwow on many nights. Stockholm is rather below normal, but Rome keeps up well.

THE Technical Editor remarked a fortnight ago, in his description of the "Cosmic Three Star," that short-wave fiends never seemed to show any waning of interest or any desire for sleep. This was admirably confirmed two days ago by the arrival of a package of prodigious dimensions, which turned out to be a log of stations heard since our competition.

#### Still At It!

This came from W. H. R., who won the broadcast side of the competition, but, nevertheless, possesses such an insatiable thirst for DX that he keeps on at high pressure!

When "P.W." runs to 200 pages I shall be able to print one of W. H. R.'s logs in full. It would probably cause what the Dailies call "an unprecedented sensation."

On top of what I term "the usual DX," W. H. R. has apparently logged Johannesburg, during the afternoon, on 49.4 metres. Other star turns are Chi-Hoa, Nairobi several times, and exceptionally consistent reception of W3XAL. I would like to live in Plymouth—I can't get them myself near London with anything like the consistency of W. H. R.!

The only other matter of interest in the week's post has been a very tame sequel

## SHORT-WAVE NOTES



News and views regarding an exciting and fascinating wave-band.

By W. L. S.

to the wonderful letter mentioned last week. I wonder why it is that some folk, having made a set "as per specification," immediately turn and rend the designer if it doesn't do everything claimed for it within the first two days? In spite of the general simplification of published sets nowadays there is always the need for a little patience, and, especially, careful re-reading of the author's remarks about the construction and operation of the set.

W. W., of Exeter, in the course of an interesting letter, mentions a little trouble that I remember having met myself. I refer to the picking up, at goodly strength,

of the broadcast programme when one is listening on an oscillating short-waver.

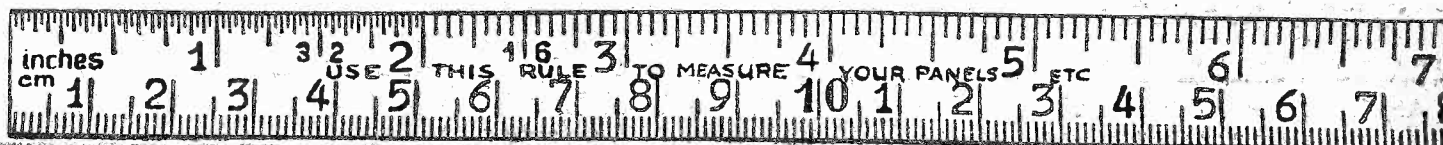
This is almost invariably due to the re-radiation of rectified current from a near-by broadcast receiver: in W. W.'s case it is a four-valver next door. Whatever station the broadcast set is tuned to, that station occupies the whole short-wave band, but only when the short-waver is oscillating.

I used to find that the omission of the earth-lead on the short-wave set cured the trouble. If it doesn't, I think the provision of an untuned S.G. stage in front of the detector should cut it out entirely.

#### An "Empire Listening" Movement!

W. W., among many others, mentions the excellent way in which Nairobi has been coming over of late. Conditions certainly are abnormally good for South-Africa, for I find that the South African "hams" are quite good on the 40-metre band, where I hardly ever remember hearing them before this year.

I think our next Competition will have to take on an "Empire" flavour, in view of the signals from Nairobi, Johannesburg and the various Canadians. It would certainly cut down the field for searching to something of easier dimensions.





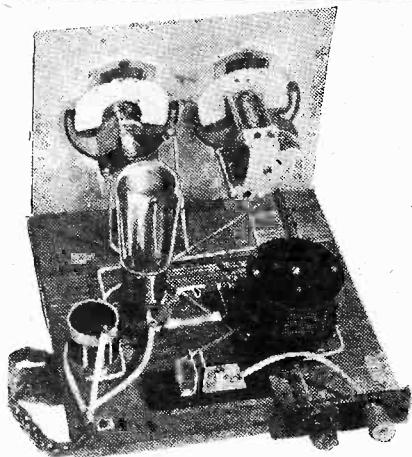


Illustration of chassis only

NOT A "KIT." Your Aerodyne Adaptor arrives ready to use in handsome Oak Cabinet—tested under broadcast conditions before despatch.

TWO COILS SUPPLIED: No. 1, 15-50 metres. No. 2, 50-100 metres.

CASH PRICE ONLY 35/- or 15/- down & 5 monthly payments of 5/-.

Attach the AERODYNE Shortwave Adaptor to your set (a few seconds work) and practically all the world's stations are at your finger tips. You can switch from New Zealand to New York—Pittsburg to Moscow—South Africa to Canada—from practically anywhere to anywhere, ALL WITH CLEAR-EST REPRODUCTION made possible by the amazing selectivity of the AERODYNE Shortwave Adaptor. (If you wish to listen back again to the ordinary programme simply disconnect the adaptor and replace valve.) The Aerodyne Adaptor gives you ANY WAVELENGTH FROM 15 to 100 METRES.

Read this extract of a letter from the wireless expert, Mr. C. E. Runeckles (SU8RS).

"I would like to say how favourably impressed I was with the appearance, and above all, with the performance of this adaptor. I tested it under the most unfavourable conditions, i.e. before two transformer-coupled stages, not re-coupled, and somewhat to my surprise there was no trace of threshold howl, that bugbear of S/W receivers, and reaction was very smooth indeed, using a Cossor 210 det. Valve.

I can claim a pretty extensive knowledge of S/W receivers of all sorts, being an amateur transmitter, and holder of one or two records, as well as being the holder for the past year of the Radio Society of Great Britain's "Worley Talbot" Trophy, awarded me for my pioneer work on ten metres, and I can truthfully

say that, judging from the short test I made, the adaptor will make almost any B/C rec. a 100% Short Waver.

Special Super-Het Model (for use with Receivers incorporating one or more stages of H.F. amplification). PRICE 45/- CASH or £1 down and six monthly payments of 5/-.

Coils supplied for the Amateur Wave-bands of 10 and 160metres. 10 metres, 4/6 each. 160 metres, 5/6 each.

POST COUPON FOR RETURN POST DELIVERY

Post to:

HUSTLER, SIMPSON & WEBB, LTD.,  
317, Hoe St., Walthamstow, London, E.17.

Dear Sirs,

Please despatch to me carriage free, an  
AERODYNE Shortwave Adaptor Standard Model.  
AERODYNE Shortwave Adaptor Super Het Model.  
(cross out line not required).

for which I enclose

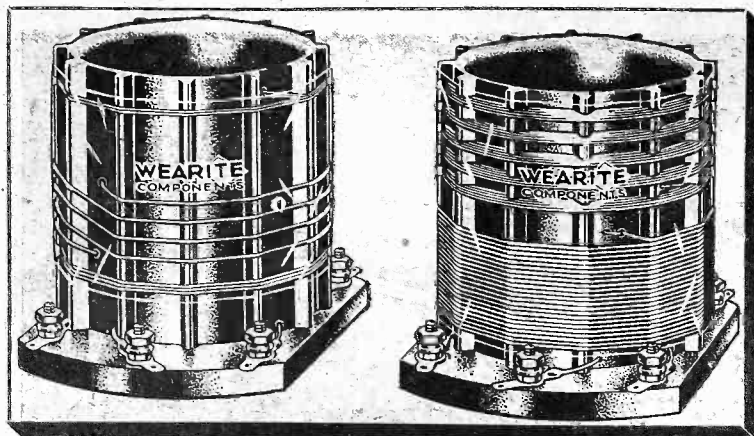
..... cash with order.

or ..... first hire purchase deposit.

Name .....

Address .....

dp



## USE 'WEARITE' COILS IN YOUR "COSMIC"

—and get the performance that the designer intended

These WEARITE components will help you to better results

### WEARITE H.F. CHOKE

An efficient choke working from 10 to 2,000 metres without marked resonances.

List No. H.F.S.

PRICE 6/6

### WEARITE ON-OFF SWITCH

A single hole self-cleaning push-pull action switch of compact design.

List No. G. 22.

PRICE 1/-

### WEARITE 4 PIN VALVE HOLDERS

Soundly built holders with spring sockets. Of highest quality bakelite.

List No. S.1.

PRICE 1/3

With such an efficient receiver as the "Cosmic" the tuning circuits *must* be above suspicion. Make certain of the performance of your "Cosmic" by using "WEARITE" coils — coils that are backed by a reputation second-to-none.

**9/- per pair**

or 5/6 for the Dual-range, and 3/6 for the Ultra Short-Wave range.

Write for Special Lists applicable.

USE THIS WEARITE EARTH TUBE!



No Screwdriver. No Spanner. Just a Match.

PRICE 3/6

If you have any difficulty in obtaining your Wearite components, write to us direct quoting the name of your dealer.

THE FIRST NAME IN RADIO COMPONENTS

# WEARITE COMPONENTS

WRIGHT & WEAIRE, LTD., 740, High Road, Tottenham, N.17.  
Telephone . . . . . Tottenham 3847/8/9.

9910

## WE BUY FROM YOU— IF YOU BUY FROM US

Here is the chance you've wanted for years! Tell us in detail what you have to sell and we will give you a price without any obligation to you.

Many applications have been received without sender's address. If you have had no reply, please apply again.

### I WANT TO SELL

SET MAKER.....CABINET OR PORTABLE ?.....  
MAINS OR BATTERY?.....HOW MANY VALVES?.....  
YEAR BOUGHT.....SPECIAL POINTS.....  
VALVES MAKE.....TYPE NUMBER.....  
MAKE.....TYPE NUMBER.....  
MAKE.....TYPE NUMBER.....  
SPEAKER MAKE.....TYPE.....

### I WANT TO BUY

COSMIC III ★ READY RADIO KIT "A" .. .. £4 19 6  
(Including specified Mullard valves) "B" .. .. £5 17 6  
(Including valves and cabinet) "C" .. .. £6 18 0  
CELESTION PPM PERMANENT MAGNET MOVING-COIL SPEAKER (complete with dual-ratio input transformer) £2 7 6  
R & A "100" PM MOVING-COIL SPEAKER (complete with multi-ratio input transformer) .. .. £2 17 6  
OR

STATE WHETHER CASH OR H.P. TERMS

NAME.....ADDRESS.....

SENDING IN THIS FORM PUTS YOU UNDER NO OBLIGATION.

## MUTUAL RADIO BUYERS

235, Regent Street, London, W.1.





**A** MPLITUDE modulation, because of fading at the receiving end, has proved unsuitable in radio-picture transmissions, for half-tone pictures on short waves.

This is why the black-and-white processes had to be resorted to in such cases, the various shadings of the original photo being, either by photographic or electric

### A COMPARISON



The top picture is the original photo and the bottom one shows how it was received on short waves and the old-time modulation method. In the centre you see the picture as it came over in accordance with the new "channel-shifting" scheme.

means, converted into a pure alternation of black and white, and special methods to effect this have been devised.

### An Interesting Lecture.

In a lecture recently delivered in Berlin at a meeting of Radio engineers, Prof. Fritz Schroeter gave an interesting account of a new method developed by himself and his assistants in the Radio-Photographic Laboratories of the Telefunken people. The new scheme is what Dr. Schroeter terms a "channel-shifting" method.

By Dr. ALFRED GRADENWITZ.  
The description of a new scheme which enables pictures to be sent through the ether at increased speed to places thousands of miles away.

Before discussing this, the following should be understood: The actual limit of the ordinary method is dependent not only upon considerations relating to the fineness of subdivision, but, in the case of short waves, as well on Echo Phenomena.

### The New Method.

The new method of transmission developed at the Telefunken Laboratories is not affected by Echo Phenomena to any larger extent than a picture transmitted over long cable lines is affected by differences in the times of travelling of various frequencies.

However, this method also makes due allowance for other peculiarities of short-wave transmission: *Fading*, in connection with the reception of modulated carrier-waves, is known continually to vary within the side-band, a phenomenon known as "selective fading."

Whereas fading of the carrier-wave invariably results in the omission of signals, selective fading at any given moment only affects a narrow frequency section of modulation, and if a signal be built up of several frequencies, it is still transmitted, though with a certain distortion. The causes of selective fading is a mutual shifting of phases of the two side-bands, due to fluctuations in the times of travelling.

The new method of half-tone transmission, then, was based upon telegraph keying and heterodyne reception, and what was aimed at was to shift the heterodyne frequency in the receiver by altering the carrier-wave itself.

The best way of altering the radiated carrier-wave was found to be the use of several distinct control frequencies, which, being selected

photo-electrically by the half-tone shades of the scanned picture, will act alternately upon the amplifiers of the transmitters.

The new method is based upon the current curve as obtained in connection with the usual photo-electric scanning of a half-tone picture and which, in the case of transmission through a cable, is immediately supplied to the receiver.

In the case of a short-wave transmitter, the continuous amplitude modulation is converted into a discontinuous scale of graduated frequencies, the range of amplitudes being subdivided into a corresponding number of intervals being made to correspond with a given shade modulation upon which the length of the carrier-wave, in turn, will depend in actual practice.

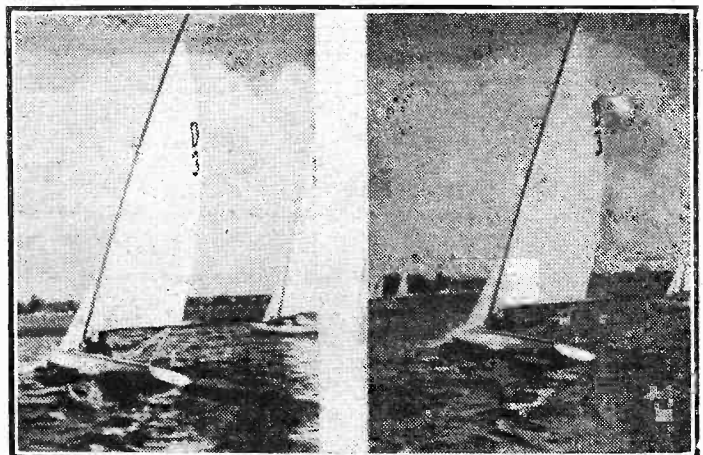
### Quartz Crystal Control.

The continuous variation of luminous shadings is thus converted into a stepwise variation of the transmitting frequency, the steps of which should be kept constant with the best means available.

A heterodyne is made use of in the receiver to obtain given intermediate frequencies. The various ranges of luminous shadings in the picture being made each to correspond with one of a series of ducts.

This scheme is obtained in actual practice by means of a loop oscillograph, the mirror of which is turned through an angle proportionate to the amplitude of the incoming picture current, thus moving a light index over a certain number of photo cells.

### WHICH IS THE ORIGINAL?



A photo and its radio-photographic reproduction at a distance by the new method. The original is on the left.

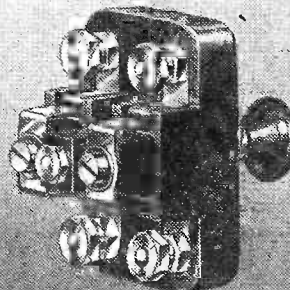
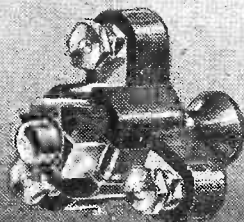
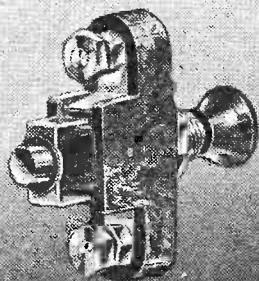
# NEARER CLEARER



## MORE LIVELY THAN BEFORE

# TELSEN

THE SECRET OF PERFECT  
RADIO RECEPTION





**"CHANGING** over to Telsen is like taking the wool out of your ears"—that is the verdict of an enthusiastic Telsen constructor which inspired the illustration on the opposite page. Telsen Components in your set give you a realism which is astonishing—they enable you to sit back and **hear**, without straining forward to listen—they bring every item on the programme 'nearer, clearer, more lively than before.'

**TELSEN  
DUAL RANGE AERIAL COILS**

**TELSEN 174**  
(Short Wave) .. 4/6

**TELSEN 154**  
(H.F. Transformer) .. 5/6

**TELSEN W.76**  
(Selectivity Control) .. 7/6

**TELSEN**  
Logarithmic Variable  
Condenser .. 4/6

**TELSEN**  
Bakelite Condensers  
Reaction from .. 2/-  
Differential .. 2/6  
Tuning .. 2/6

**TELSEN**  
Pre-set Condensers .. 1/6

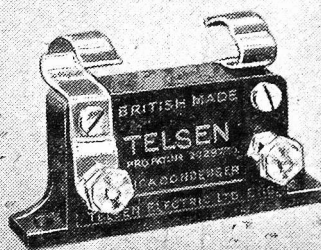
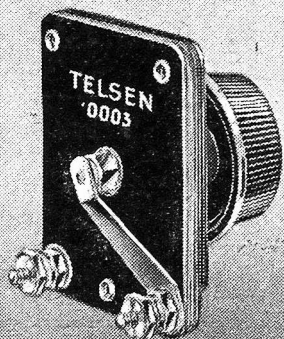
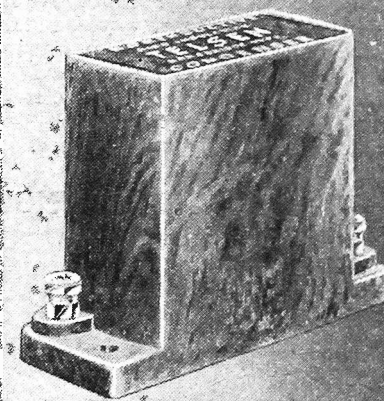
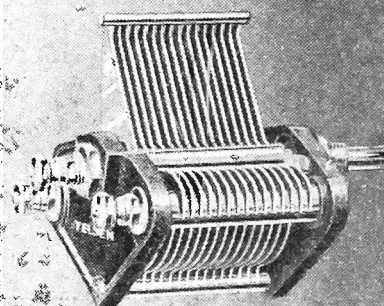
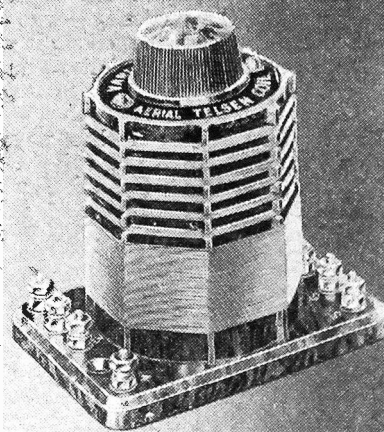
**TELSEN**  
Mansbridge (Type) Condensers  
Prices from 1/6

**TELSEN**  
Fixed Condenser  
(Prov. Pat. No. 20287/30) .. Price 6d.

**TELSEN**  
Push-Pull Switches  
(Prov. Pat. No. 14125/31)  
Two-point .. Price 1/-  
Three-point .. Price 1/3  
Four-point (2 pole) .. Price 1/6

# TELSEN

**100% BRITISH  
RADIO COMPONENTS**



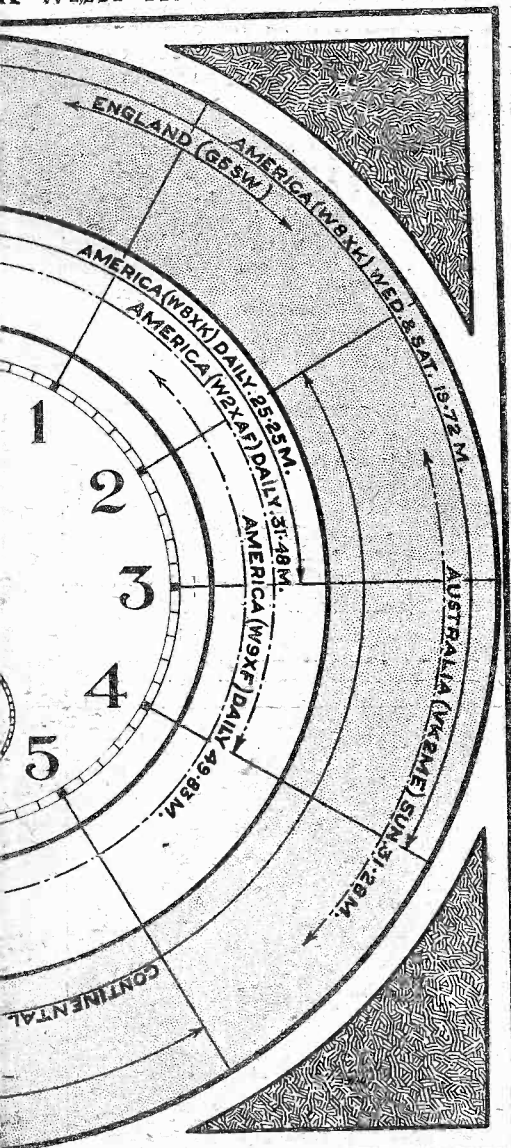






able advice  
reception,  
primary details  
cial Lisbon

## WORK WITH THE "COSMIC"



wavers you can expect to receive at any hour of the day or night. Cut it out when you have read your "P.W." and keep it handy for reference.

"hitched" to a really distant station, and then try and drag yourself away and go to bed! I'll take my hat off to you if you succeed.

As I have said previously, I expect the "Cosmic" will have raked in a great many who have never before tackled this fascinating short-wave business, and, to be quite candid, it's not quite so straightforward as ordinary broadcast reception. But that is only to be expected when it is remembered that the movement of the transformation switch brings about an increase in frequency of approximately ten to one.

### It's Kilocycles That Count.

After all, it is frequency that counts when it comes to tuning considerations, with a ten to one increase in going from broadcast to short waves, it is only logical that the dial will need to be turned ten times more slowly in order to achieve the same measure of success.

If YOU want to hear the inimitable Captain "P.P.E.'s" voice via the ether, make a special point of calibrating your set in advance!

You can do it to-morrow (Friday) night from 10 to 11 p.m.

**THE WAVE-LENGTH IS 42.9 METRES**

And you will probably find it between 165 and 175 degrees on your "Cosmic" tuning dial.

It is rather necessary to stress the importance of this slow manipulation on short waves, for I am convinced that it is failure to observe this procedure that accounts for considerably more than half the "no-signals" troubles with new hands at the game. But I do not want to create the impression that you will require months of experience before you can hope to succeed. Not a bit of it.

### Practice Makes Perfect.

Like most other things, there is a knack in it, and when you've had a couple of evenings with the "Cosmic" on short waves you shouldn't have any difficulty in obtaining results every bit as good as mine have been. But more about that later.

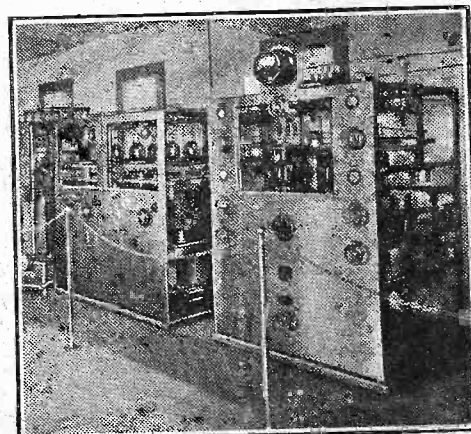
For the moment I want you to imagine that you are with me, spiritually, on one of my recent "Cosmic"

tests, and by that means I am hoping that you will be able to get a clear idea of the exact procedure to be adopted when searching round on short waves.

On the table before us is the "Cosmic" all connected up and ready for use. We will assume that this is our first test of the set on short waves, and that in consequence we must go through the normal procedure necessary when testing out a new short-waver.

Well, the first thing is to find out whether it will oscillate satisfactorily. So let us

## DOWN UNDER!



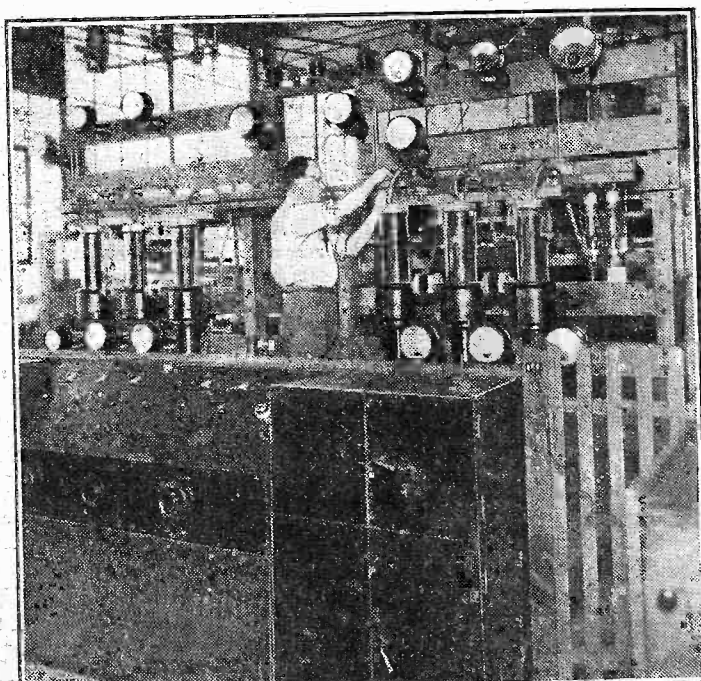
Melbourne (Australia) is often heard very well in this country under the call-sign of VK3ME. Here you see a section of the well laid-out short-wave transmitting gear.

switch it on. There—now we can soon find out.

Hm! Sounds lively enough, anyway, but we must be systematic and start with the tuning-dial at minimum. What's that—why have I set it at 100 degrees? Well, that is minimum of one-half of the extender, and on short waves, although it doesn't very much matter over which half we tune, it is,

(Continued on next page.)

## BEHIND THE SCENES AT SCHENECTADY



It is hardly surprising that W2XAF and W2XAD, the twin short-wave transmitters at Schenectady, should also be referred to as "punch-merchant" stations, for our picture above shows only a part of the giant transmitting apparatus that is used by them.



## YOUR "COSMIC" ON SHORT WAVES

(Continued from previous page.)

if anything, slightly better to tune over the half that is normally long-waves.

Now let's see if it oscillates. Slowly advance in a clockwise direction this knob on the right until—yes, it oscillates there.

station calling "C Q," which is a sort of general call to all stations. But we won't waste time listening to that; let us get on up. Eight—nine—and so up to twenty, then phe-oo-ee! Gosh! this is a good carrier, let us try and resolve it.

Notice the carrier-wave whistle is exactly the same as on broadcast waves—it starts right up high, and as you *very slowly* adjust the tuning it comes down to a low growl and then goes up high again on the other side. Now to resolve it we must endeavour

the question of conditions has a lot to do with it, you can always count on finding *something* of interest.

And if, on account of thoroughly bad conditions, you do not succeed in getting America the first time, well, don't immediately jump to the conclusion that your set is at fault. Just give it a rest for a day or two and then have another go.

### Nothing to go Wrong.

If it oscillates satisfactorily, and it seems reasonably lively, well, you can take it from me there is nothing very much wrong with the set.

By the way, talking of oscillation, I've got an idea that one or two of you "P.W." readers still go in for "outsizes" in aeri-als. To which you may feel inclined to retort "Well, what has that got to do with oscillation?"

Well, the fact of the matter is that in designing the aerial coupling for the short-wave side of the "Cosmic" the turn numbers and spacing were adjusted to give the maximum efficiency in conjunction with average-size aeri-als. It is just possible, therefore, that if you use the "Cosmic" on short-waves with a large aerial, you may come up against "dead spot" difficulties.

Dead spots can be detected by the complete absence of oscillation over certain narrow bands here and there in the tuning range, and they can very easily be overcome on our flexible "Cosmic" by using a neutralising-type series-aerial condenser between the set and the aerial lead-in. I don't anticipate for one moment that many of you will find such a condenser to be necessary, but if you do, then you must not forget to short it out when the set is in use on broadcast and long wave-lengths.

### A Little Wrinkle.

Here's another wrinkle you might like to try, although I'm not at all sure that I ought to tell you this one, because the last thing in the world that I want to convey is that it is possible by drastic action to improve upon the fundamental "Cosmic" design! That, very definitely, is *not* possible.

But the conditions under which short-wave reception can best be attempted vary so tremendously that, however universal

(Continued on page 1504.)

## "P.W." CALLS UP LISBON



This interesting picture was taken while "P.W.'s" Technical Editor, Mr. Dowding, was discussing with the manager of CTIAA the final details of our special broadcast. Mr. Kelsey is seen on the left making notes of the proceedings.

all right. How do I know? Well, can't you hear that noise that sounds somewhat like escaping steam? Yes, that's oscillation.

You see, you just advance this reaction control knob until you reach the point where it seems almost as if you have opened the safety-valve of a steam-engine. And when you go beyond that point the set is oscillating. Simple, isn't it?

Next thing is to determine whether it will do that all the way up the dial. Left-hand on the tuning control, right hand adjusting the reaction knob, and so we advance twenty degrees at a time, noting carefully whether it still oscillates at every readjustment. Yes, it oscillates right up to 200 degrees, so now we can listen for signals.

### On "The Edge" of Oscillation.

Best to start down at minimum again, and we must advance the reaction knob until it is just a fraction beyond the point where the "escaping steam" commences. And we must not forget to turn this tuning control ten times more slowly than we should on the normal broadcast waves.

Slowly—very slowly—one hundred and one, two, three, four, five—swish, now the set has stopped oscillating, so we must advance the reaction knob a trifle more. Yes, that reaction control requires almost constant readjustment in order to maintain the set in a state of oscillation.

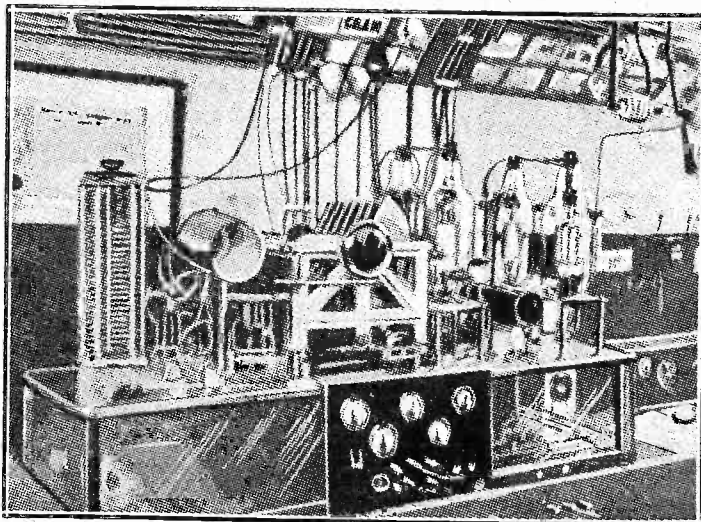
Six—seven—ha, here's a whistle: "dah-di-dah-di. dah-dah-di-dah." It's a C.W.

to keep that low growl position while we decrease the reaction control to the point where the set *just* stops oscillating, and then, if the station is strong enough, we shall hear speech. You will notice that I have to make very delicate adjustments to the tuning control in order to keep that low growl condition as the reaction is decreased.

Ah, music—sh! it has stopped: "This program comes to you through the courtesy of the Baked Beans Corporation." No need to tell you that is American! A hundred-and-twenty degrees, that is about twenty-five metres; yes, that is W S X K.

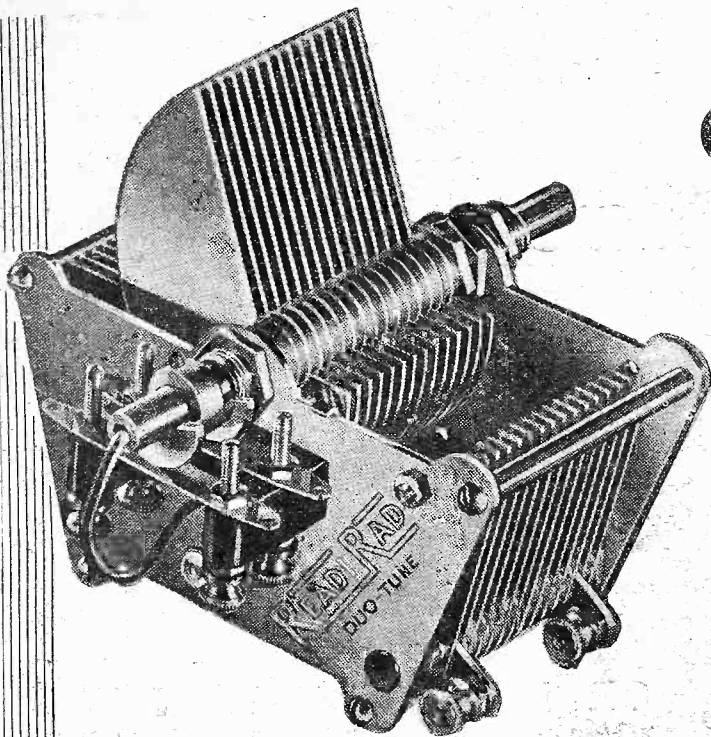
Get the idea? You see, it is all a matter of careful tuning and delicate adjustment, and when you go about it in that way, there is really nothing very difficult. You will find you can tune in stations like that all the way up the dial, and although in the reception of the really distant stations

## THE "HELLO, ENGLAND" SIDE OF IT



This is part of the elaborate equipment at Lisbon that will enable YOU to participate in this highly-interesting broadcast. Be sure not to miss "P.P.E." via the ether!

# You must use a DUOTUNE CONDENSER for your COSMIC STAR



**READIRAD DUOTUNE 15'6**

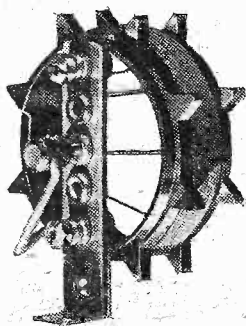
(Extenser Model, Patent Pending)

The Readirad DUOTUNE is essential for the "Cosmic" and for every modern all-wave receiver. It is the only condenser of its kind. Not only does it provide automatic switching from medium to long waves (on the famous Extenser principle) but also at the flick of a switch it is converted from a .0005 - mfd. condenser to a .00025 - mfd. condenser. It combines all the advantages of wide tuning range with easy station separation.

An important feature is that all the plates are in use all the time so that no losses are introduced and maximum efficiency is maintained over both tuning ranges.

The DUOTUNE was specially designed for the "Cosmic" Star by G. P. Kendall, B.Sc.

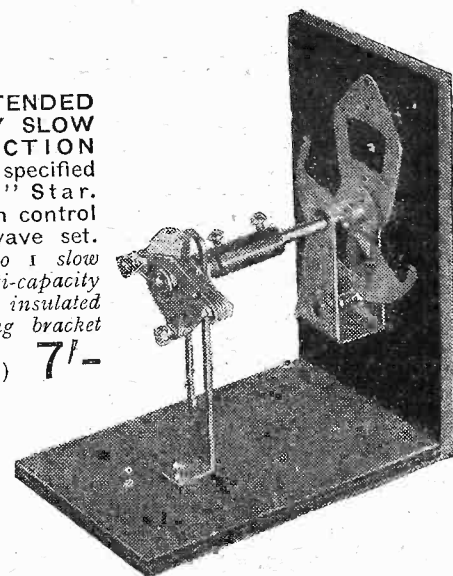
Fit a DUOTUNE in place of your present condenser and bring your present set right up to date. Full-size blue print of the "Cosmic" Star is supplied with every DUOTUNE showing the connections.



READIRAD  
MODERATOR COIL  
wound strictly to  
specification. Price **2/6**

Readirad .00075 Modera-  
tor Condenser " 3/6

READIRAD EXTENDED  
ANTI-CAPACITY SLOW  
MOTION REACTION  
EQUIPMENT as specified  
for the "Cosmic" Star.  
The ideal reaction control  
for every all-wave set.  
(Consists of 20 to 1 slow  
motion drive, anti-capacity  
extension with insulated  
coupling, mounting bracket  
and .0003 - mfd. variable condenser.) **7/-**



**FULL-SIZE BLUE PRINT FREE.**

Send four 1½d. stamps for a copy of Mr. Kendall's Book entitled "10 Hows for Modern Radio Constructors" (published at 6d.) and we will include a "Cosmic" Star Blue Print FREE.

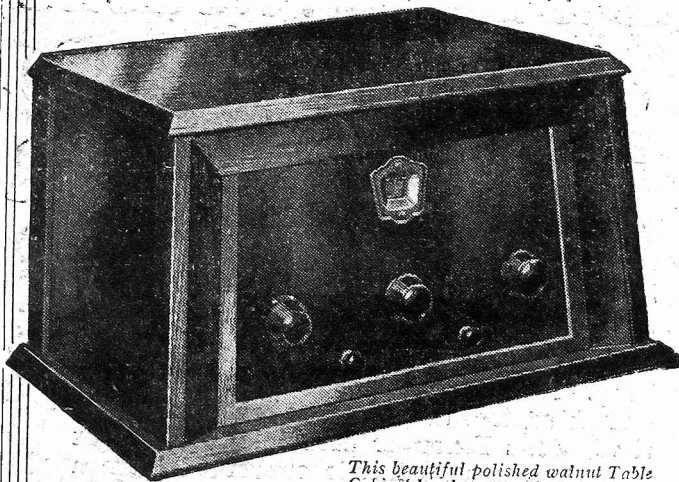
COUPON  
To: **READY RADIO LTD.**, Eastnor House, Blackheath, S.E.3.  
I enclose four 1½d. stamps. Please send me a copy of Mr. Kendall's Book and free full-size blue print of the "Cosmic" Star together with complete list of Ready Radio "Cosmic" Star Components.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
P.W. 5332

## READY RADIO

READY RADIO LIMITED, Eastnor House, Blackheath, S.E.3  
Telephone—Lee Green 5678. Telegrams—"Readirad. Blackvill"

# Build your COSMIC STAR



This beautiful polished walnut Table Cabinet has been specially designed for the "Cosmic" Star, but is also equally suitable for any set with a panel not exceeding 12" x 7" and baseboard 14" x 10". Price 21/-

## LIST OF PARTS as shown on Blue Print

	s.	d.
1 Ebonite Panel, 12" x 7", drilled to specification	4	0
1 Plywood Baseboard, 14" x 10"	1	0
1 Ebonite Terminal Strip, 14" x 2"	1	0
2 L.T. Switches	1	8
1 Readirad 00075 Moderator Condenser	3	6
1 Duotune Extender	15	6
1 Slow-Motion Disc Drive for above	3	0
1 Readirad 0003 Extended Slow-Motion Reaction Condenser with Bracket	7	0
3 Valve Holders	1	6
1 R.I. "Cosmic" Dual Coil Unit	12	6
1 Readirad Moderator Coil	2	6
1 T.C.C. 001 Fixed Condenser, Type "S"	1	6
1 Readirad Standard H.F. Choke	4	6
1 Lewcos 100,000-ohms Spaghetti Resistance	1	6
1 Readirad Radiogram Switch	2	9
1 T.C.C. 0003 Fixed Condenser, Type "S"	1	3
1 Readirad Wave-Change Switch	1	6
1 R.I. Hypermite L.F. Transformer	12	6
1 Grid Leak, 2 megohm and Holder	1	4
1 T.C.C. 01 Fixed Condenser, Type 40	1	9
1 Grid Leak, 5 megohm, and Holder	1	4
9 Belling-Lee Terminals, Type "R"	2	3
1 Packet of Jiffilix for wiring	2	6
3 Belling-Lee Wander Plugs	6	
Flex, screws, &c.	1	2

**£4 9 6**

Any Component can be purchased separately

## Official Blue Print FREE with every READY RADIO KIT

Visit our Showrooms at 159, Borough High Street, London Bridge, S.E.1 (2 minutes from London Bridge Station) to see and hear the wonderful "Cosmic" Star.

# READY RADIO

Advt. of Ready Radio Ltd., Eastnor House, Blackheath, S.E.3.

## with a READY RADIO Official Blue Print Kit

### KIT "A"

Complete Kit of Components together with panel (ready cut and drilled), baseboard, Jiffilix for easy non-soldering wiring and free blue print.

# 89/6

OR BY EASY PAYMENTS  
10/3 down and 9 monthly payments of 10/3

KIT "B" Complete Kit of Components as Kit "A" together with specified Mullard valves and free blue print. **£5.17.0**

OR BY EASY PAYMENTS  
11/- down and 11 monthly payments of 11/-

KIT "C" Complete Kit of Components as Kit "B" together with Table Cabinet illustrated above and free blue print. **£6.18.0**

OR BY EASY PAYMENTS  
12/9 down and 11 monthly payments of 12/9

### IMMEDIATE DESPATCH

#### BATTERY AND SPEAKER EQUIPMENT

1 Pertrix 120 volt H.T. Battery	15	6
1 Pertrix 2 volt 30 amp. Accumulator PXC3	11	0
1 Pertrix 9 volt G.B. Battery	1	3
1 R & A type 40 Loudspeaker Chassis	16	6
	<b>£2 4 3</b>	

Kit A, including above. Deposit 12/6 and 11 monthly payments of 12/6  
Kit B, including above. Deposit 15/- and 11 monthly payments of 15/-  
Kit C, including above. Deposit 17/- and 11 monthly payments of 17/-

TO INLAND CUSTOMERS.—  
Your goods are dispatched post free or carriage paid.

TO OVERSEAS CUSTOMERS.—  
Everything Radio can be supplied against cash. In case of doubt re-

garding the value of your order, a deposit of one-third of the approximate value will be accepted and the balance collected by our Agent upon delivery of the goods. All goods are very carefully packed for export and insured, all charges forward.

'Phone: Lee Green 5678.

'Grams: Readirad, Sedist.



# MAKE A JOB OF IT!

**Build a Cosmic Radiogram with a Ready Radio Cabinet and accessories**

## "COSMIC" STAR RADIOGRAM KITS BY EASY PAYMENTS

**Kit "B" (full set of components and valves) with Radiogram Cabinet and R & A type 40 Loudspeaker Chassis.**

**Deposit of 20/- and 11 monthly payments of 18/6**

*The above Kit may be purchased in combination with any of the accessories listed. Examples:*

**Kit "B" with Radiogram Cabinet, Speaker, Pick-Up, Volume Control and Gramophone Motor.**  
**Deposit of 25/- and 11 monthly payments of 25/-**

**Or Kit "B" with Radiogram Cabinet, Speaker and Battery Equipment as detailed on opposite page.**

**Deposit of 20/- and 11 monthly payments of 21/6**

ReadiRad Pick-up	£	s.	d.
ReadiRad Volume Control	1	7	6
Collaro B.30 Double Spring Gramophone Motor with Automatic Stop		5	9
	1	13	0
	£3	6	3

or **10/-** down and 7 monthly payments of 9/-.

As above but with Collaro A.C. Induction Motor - **£4 13 3**

or **10/6** down and 9 monthly payments of 10/6.

As above but with Macom Motor, type A, suitable for D.C. Mains - **£4 5 9**

or **10/-** down and 9 monthly payments of 9/6.

ReadiRad Pick-up	£	s.	d.
ReadiRad Volume Control	1	7	6
R & A type Loudspeaker Chassis		5	9
		16	6
	£2	9	9

or **10/6** down and 5 monthly payments of 9/-.

As above but with R & A type 100 Permanent Magnet Moving Coil Speaker, with Matching Transformer - **£4 10 9**

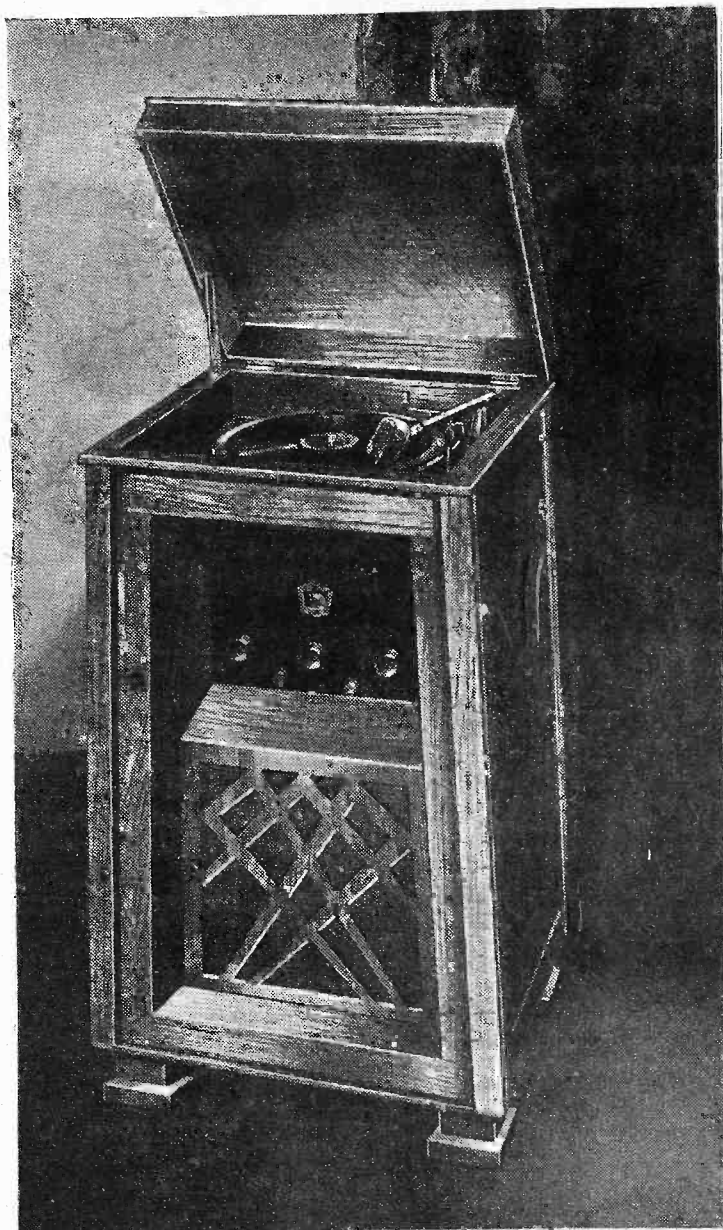
or **10/-** down and 9 monthly payments of 10/6.

ReadiRad type B.S. A.C. Mains Unit, 150 volts H.T. & Trickle Charger for 2, 4 or 6 volts - **£5 17 6**

or **10/9** down and 11 monthly payments of 10/9.

Atlas or Ekco D.C. Mains Unit - **£1 19 6**

or **8/6** down and 5 monthly payments of 7/-.



## Ready Radio Radiogram Cabinet

With this beautiful cabinet you can convert your present set to a Radiogram of the most modern and artistic design. This cabinet is of highly polished walnut with lift-up lid, automatic support and a needle cup. Overall-size 3' 3" x 22" x 17". Suitable for any receiver having a panel not exceeding 12" x 7" and a baseboard 16" x 10".

**Price £3.7.6**

or deposit of **15/-** and 6 monthly payments of 10/-.

## CASH or C.O.D. ORDER FORM

To: **READY RADIO, LTD.,**  
Eastnor House,  
Blackheath, S.E.3.

Please dispatch to me at once the following goods.....

for which (a) I enclose (cross out line) £.....  
(b) I will pay on delivery (not applicable)

Name.....

Address.....

P.W. 5/3/32

To: **READY RADIO, LTD.,**  
Eastnor House,  
Blackheath, S.E.3.

Please dispatch to me the following goods.....

for which I enclose first deposit of £.....

Name.....

Address.....

P.W. 5/3/32

## EASY PAYMENT ORDER FORM

## YOUR "COSMIC" ON SHORT WAVES

(Continued from page 1500.)

in its application our original design may be, almost inevitably there are bound to be a certain few for whom a minor adjustment may make it possible to obtain just that little bit extra that counts for so much on short waves.

So that if you are one of the "certain few" who can't quite get to the ends of the earth with your "Cosmic" on short waves, well, try the dodge of connecting a piece of wire between terminal No. 3 on the short-wave coil (No. 2 on the coils numbered from 1 to 6) and the plunger of the transformation switch at the back.

### Well Worth Trying.

You will notice that I say to the plunger of the switch. Well, that is because this alternative connection scheme must not be common to any of the other terminals on the switch when the plunger is pushed in. As a matter of fact, just for the sake of trying it out, you have no need even to go

### THE DETAILS CONCERNING "P.W.'s" SPECIAL SHORT-WAVE PROGRAMME FROM LISBON.

DATE. FRIDAY EVENING, MARCH 18.  
TIME. COMMENCING AT 10 p.m.  
WAVE-LENGTH. 42.9 METRES.  
POWER. 2 KW.  
CALL SIGN. CT1 AA.

to this trouble, for you can quite easily bend up a piece of stiff wire to form a third contact to be shorted to the other contacts only when the switch plunger is pulled out. That will do the trick all right.

Then, if you find the little wrinkle appears to be advantageous, well, you will probably consider it worth while going to the expense of a four-contact switch in order to do the job properly. After all, the new switch will only cost you about 9d., and it is not as if the present switch is wasted, for there are dozens of uses to which you can put that at some future time.

### Use a Four-Point Switch.

So that if you happen to be one of the few for whom this little alternative scheme seems desirable, well, take my advice and do the job properly by fitting a proper four-contact push-pull switch. The three wires which go to the present switch will, of course, be joined to three of the terminals on the new switch, and the remaining terminal will be joined to the terminal I have indicated on the short-wave coil. That's all there is to it!

Now I am afraid that I am getting towards the end of my space, so I am going

to conclude by giving you just an *approximate* idea of where to adjust the tuning dial of your "Cosmic" for certain wave-lengths, and I am also going to say a word or two concerning the more powerful stations to look out for.

The small band of stations in the neighbourhood of 20 metres will probably be found at the very minimum of the tuning condenser. As to whether your particular

them at about 125 degrees on your tuning scale.

Between 155 and 165 degrees, on your scale, which you will probably find is about 30 to 32 metres, there is a whole bunch of interesting stations. Just to mention a few of the more important ones, there is Agen at 30.75 metres, Sydney (Australia) at 31.28 metres, Melbourne (Australia) on the same wave, Zeesen on 31.38 metres, Schenectady (W 2 X A F) on 31.48 metres, and Bandoeng on 31.86 metres. The next jump is to 40 metres, where dozens and dozens of amateur stations begin to come in.

### Logging the "Landmarks."

There are, of course, a great number of stations between 32 and 40 metres, but we are only concerned at the moment with "landmarks." When you get the set roughly calibrated you will be able to find dozens of really loud stations that we haven't mentioned.

The beginning of the amateur band will probably be found at about 190 degrees on your dial, and when you reach maximum, then pull out the capacity-change switch and turn the condenser back to 165 degrees, which roughly corresponds with the wave-length at which you left off on the lower range.

The setting of 165 degrees with the capacity-change switch pulled

### CALIBRATE YOUR SET FOR 42.9 METRES BEFORE THE DATE!

A special announcement of interest to every "P.W." reader will be made at the commencement of our Lisbon programme and in order not to miss the opening, you would be well advised to calibrate your "Cosmic" in advance.

CT1AA can be heard every Friday evening from 10 p.m. onwards, and his signals are usually received at remarkably good strength in this country.

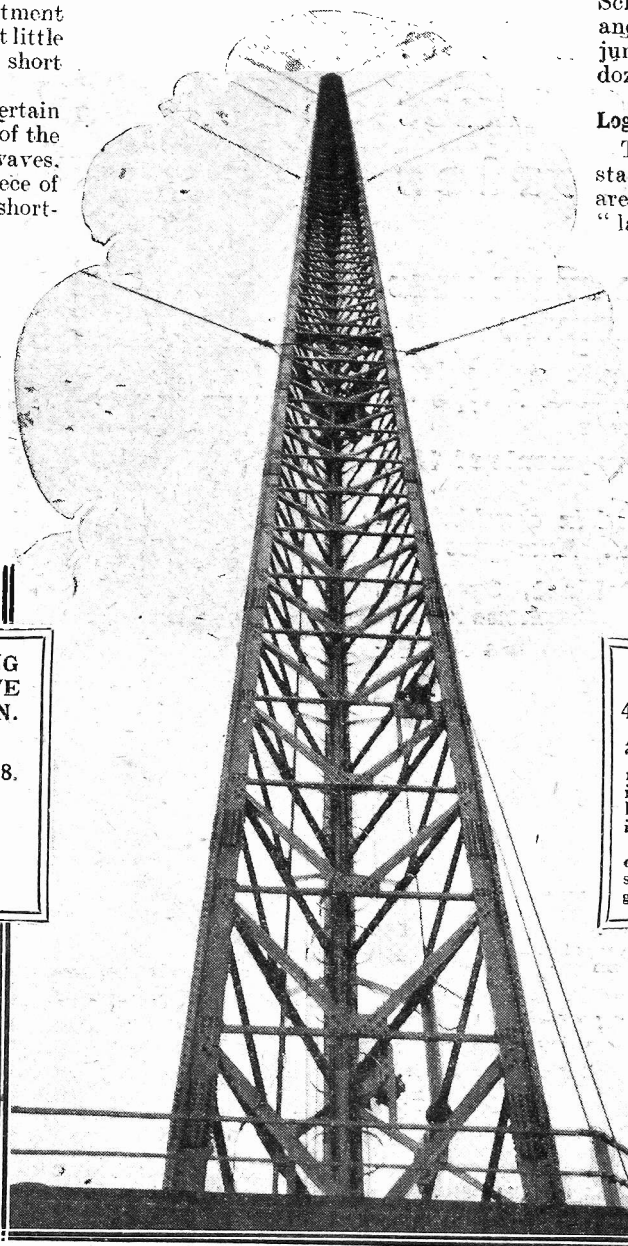
out you will probably find to be about 42 metres. Proceeding up the scale, 175 degrees will bring you in the neighbourhood of 44 metres, 185 degrees to 48 metres, and right at the top of the scale will give about 54 metres.

There is one little tit-bit that I have saved up as a sort of happy concluding note, and that concerns a station to which I haven't yet referred.

### Locating Lisbon.

Between about 160 and 170 with the capacity switch pulled out you will find station CT1AA on a wave-length of 42.9 metres. It is from this station that "P.W." is glad to be able to announce that a special programme for "Cosmic" owners will be transmitted on the evening of March 18th, commencing at 10 p.m.

Every single reader of "P.W." is cordially invited to participate in this important test, and, although we are unable to give you complete details until the next issue, we can tell you that the voice of "P.W.'s" Chief Radio Consultant, Captain P. P. Eckersley, will be heard over the air on this occasion. Be sure not to forget the date, March 18th, at ten "pip-emina"!



version will get down to the two American stations just above 19 metres is a matter which will depend upon the way in which you have carried out your wiring. If the wiring is short and well spaced, well, you will probably find that you can just tune them in.

The two stations in question, which come in very well indeed at times, are W2XAD and W8XK on 19.56 and 19.72 metres respectively. Anything much below 20 metres is usually considered to be what is known as a daylight wave, and, in consequence, the best time to listen for them is late in the afternoon, while it is still light over the best part of the Atlantic.

Two more good "landmark" stations, W8XK and G5SW, are in the neighbourhood of 25 metres, and you should find

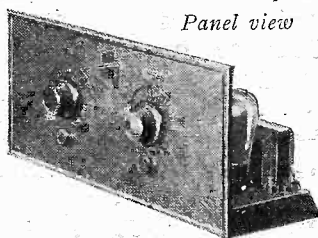


# NEW

in design  
and low  
in price

build it  
and listen  
to-night

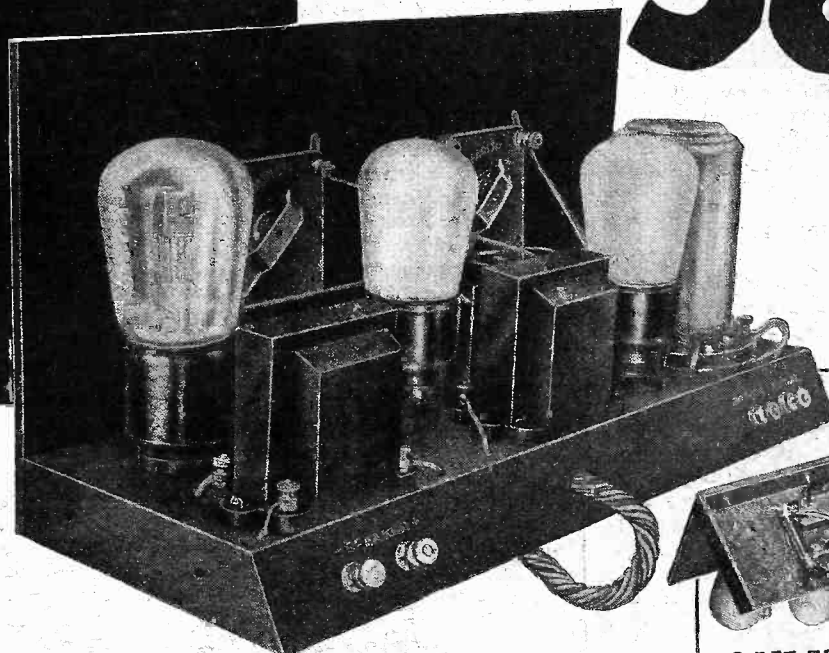
With the production of this revolutionary receiver, Graham Farish—makers of famous Radio Components for 11 years—enter the Kit-set field. The "AMAZING 3" (amazing in more ways than one) incorporates Graham Farish components exclusively, built around a specially-designed dual-wave coil of remarkable efficiency. All-British and Continental reception over the entire waveband becomes a commonplace!



Selectivity is far above the average for a set of the "straight three" type! Regional station separation is as defined as that of any set costing many times the price! As for assembly—every Component "falls in place"! Your dealer has the "AMAZING 3" in stock now. Ask him for the FREE Descriptive Leaflet—or use the coupon below. You can assemble the Kit to-night!

Panel view

**COMPLETE KIT**  
**AMAZING 3**  
**38/6**



All-British

Underneath of Chassis.

**The ONLY KIT with**

... A specially designed **SCREENED COIL**.

... A Moulded **BAKE-LITE PANEL**, with scale readings and indications in relief and fixing holes drilled.

... A Moulded **BAKE-LITE well CHASSIS**, with position for each component outlined in relief and fixing holes drilled.

... The majority of wires concealed beneath chassis.

... A factory-built appearance when finished.

Single-knob tuning. No soldering.

Spanner and Screwdriver—the only tools required—provided with each Kit.

Each Kit packed in attractive Orange and Black Container.

**Already . . . !**

Eastbourne:  
"I got splendid results, both at home and abroad. I consider you are quite justified in claiming your Kit as the 'Amazing 3'."

Nottingham:  
"Have got the 'Amazing 3' built, and it is truly amazing. I have never heard a better set, and am more than pleased with it."

Liverpool:  
"I must first congratulate you on producing such a fine Kit as the 'Amazing 3', which I think is great value for the money."

Cornwall:  
"On test the set is stable, and the quality of reproduction excellent. Taking the set on finish and price basis, it is, certainly, an 'Amazing 3'."

**Emergency  
Coupon!**

In case of difficulty send this coupon for FREE Descriptive Leaflet to **GRAHAM FARISH LIMITED**, Bromley, Kent.

Name.....

Address.....

Use a Graham Farish Speaker for best results from your "AMAZING 3."

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

By O.H.M.

**BEECHAM AND THE B.B.C.****BOTHER ABOUT SUNDAY PROGRAMMES—SIR KINGSLEY WOOD'S INTEREST—THE BIG DANCE BAND CHANGE-OVER.**

THE Delius programme is by no means the whole story of forthcoming co-operation between the B.B.C. and Sir Thomas Beecham. And the curious thing about it is that neither Sir Thomas Beecham himself, nor those at broadcasting headquarters responsible for operatic and allied interests appear to realise that in future much closer co-operation seems to be inevitable if the interests they represent are to be served.

**Bother About Sunday Programmes.**

There is probably on the average one sensational "leading" story about the B.B.C. every week. One can tell, however, what is happening inside by assessing the nature of the reaction.

This is particularly true of the storm of resentment which greeted a recent amusing imaginative effort about prospective reforms of Sunday programmes. There was nothing in the story actually, but the B.B.C. has become so self-conscious about the weakness of its position on week-end programmes generally that the denials were furious.

I am watching the situation, and shall give exclusive advance information of policy changes, if any.

**Sir Kingsley Wood's Interest.**

Sir Kingsley Wood, as Postmaster-General, is having to make a special report on broadcasting in time for the Prime Minister to make up his mind about the Board of Governors after this year. Incidentally, a good many Members of Parliament are disappointed that the terms of reference of the business committee of investigation into the Post Office do not appear to include the B.B.C.

The answer to this is, I believe, plain. Lord Plender, the moving spirit of the enquiry into the Post Office, nominated Mr. Harold Brown, the new Governor of the B.B.C. Mr. Neville Chamberlain approved.

There is a strong movement to support the continuance in office of Lady Snowden after this year.

**The Big Dance Band Change-over.**

The large studio on the top floor at Broadcasting House, the first of a score to be completed and decorated, has been used for the past fortnight for rehearsals

by Henry Hall's new B.B.C. Dance Orchestra which, on Thursday, March 15th, takes over the work so admirably carried out by Jack Payne and his Boys.

**Henry's Men.**

The band consists of fourteen members, among them two players from Mr. Hall's Gleneagles Hotel Dance Band—F. B. Gillis, leader of the saxophone section, and E. Cramar, another saxophonist; Harry Robbins, drummer, and one of Jack Hylton's famous players; W. Mulrancy, trombone, previously with Percival Mackey; Frankie Wilson, trumpeter, who has played

in Ciro's and the Dorchester House bands. Others are J. Hieenor and Cyril Stapleton, violinists; R. Matthews, oboist, all of whom have come straight from college, the last-named being only 16 years of age. Other members are F. Williams and J. Denahy, saxophonists, who are well-known London players; J. Phillips, a pianist from Edinburgh; T. Farrar, bass, from the Midland Hotel, Manchester; and G. Dickinson, guitar and tenor saxophone, from Liverpool.

Unlike Jack Payne, Henry Hall has decided not to make any announcements himself: this side of the programmes will be done by Val Rosing, a vocalist whose voice is already familiar with listeners to vaudeville programmes. I understand that negotiations are going on for filming the band in action as part of one of the news reels which will be shown in cinemas all over the country during the week of the band's first broadcast.

No doubt the band will wear its uniform of blue tunics with black collars and cuffs, which Mr. Hall considers more appropriate than the conventional evening dress.

Meanwhile, I understand that Jack Payne and his Boys will make their farewell appearance in vaudeville on Wednesday, March 9th, when they take part in the London Regional programme with the Nesbitt Brothers, Stainless Stephen, Peggy Cochrane, Harry Hemsley, Patrick Waddington, Mamie Soutar and Blake Adams, and Ashmoor Birch.

National listeners in the same week are  
(Cont. on page 1515.)

**SAVES TIME IN RUNNING COMMENTARY**

This cheery chap is pleased because his field-glasses don't need holding, being strapped on like a pair of headphones, as shown. He finds the running commentary quite easy now.

**THE LISTENER'S NOTEBOOK**

A rapid review of some of the recent radio programmes.

MR. DU GARDE PEACH'S production. "The Mary Celeste" was a fine piece of realism. Creaking winches, moaning winds, lashing seas, sea-shanties, blasphemous old sea-dogs, their fears and superstitions—all were there to lend colour to a good story, and, what was most remarkable, there was a total absence of staginess about it all. Every character, from captain to deck-hand, was well drawn and well played; but if there was an outstanding one it was "Dutchy." I liked him, because he had no lapses. He was Dutch—and good Dutch, too—all through.

That's more than I can say about the "Americans" in the play that preceded "The Mary Celeste." They lapsed into

English all too frequently. By the way, need the plot have been laid in America at all?

Although the effects in "The Mary Celeste" were good, they were only possible because of the excessive bawling of the ship's crew. Nothing could drown that. There is, however, a very great danger of losing the thread of a story when effects are too obtrusive, and particularly when the dialogue is given in conversational voice.

I always think this does happen in the Saturday night Train Conversations. In this type of show we certainly want to hear the subject of the conversation; the noises are of secondary importance, and will  
(Continued on page 1516.)

**THE "COSMIC" THREE**

Dear Sir,—I feel that I must write to you regarding that marvellous set, the "Cosmic" Three. I have never before heard so many stations on a three-valver of the det. and 2 L.F. type, whilst the volume leaves nothing to be desired.

This is the first time I have ever been on the short-wave band and so cannot compare results, but I got several telephony stations on the loudspeaker and a good few Morse, too.

I feel sure that this set will prove to be one of the most popular you have ever designed.


Yours truly,

S. G.

Roman Road, Barnsbury, N.7.



# EVERY BATTERY-SET SHOULD NOW HAVE "PENTODE OUTPUT"



**AN  
AMAZING  
STEP-UP  
IN  
VOLUME**

**T**HE Lissen Power Pentode Valve takes no more current than any ordinary power valve. It consumes actually only 7 m/A of H.T. current and can be run economically off ordinary batteries. **THERE IS, THEREFORE, NO REASON WHATEVER WHY EVERY BATTERY-DRIVEN SET SHOULD NOT EMPLOY THIS POWERFUL LISSEN VALVE.**

If you want extra volume, try this valve. If you want all the foreign stations at full loud-speaker strength, try it. Particularly in conjunction with a cone loud-speaker try this Lissen Power Pentode Valve—it produces a new brilliance of tone which pleases every ear and automatically corrects the tone balance of the music.

You do not have to alter the wiring of your set at all. You do not have to increase the battery power. This one valve gives you much more volume, much clearer, louder, finer radio altogether. Ask for the Lissen Economy Power Pentode P.T.225. **PRICE 12/6**

*The* **LISSEN**



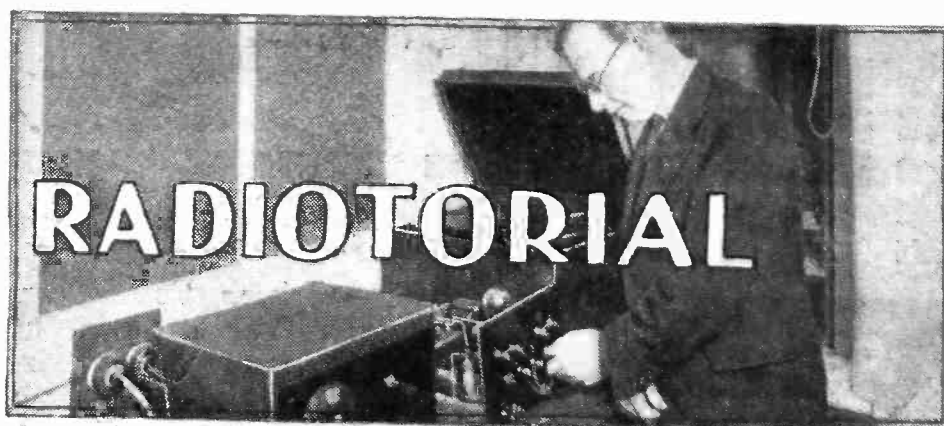
## THE LIVELY LISSEN DETECTOR

If you want to liven up your tuning—if you want extra range, greater sensitivity—get a Lissen Detector Valve for your set. You will find its lively responsiveness bringing in the foreigners like magic.

Match it up to a well-built set and work it in harness with other suitable Lissen valves, and you will be amazed at the results you get, the distance-searching you can do. Ask for Lissen H.L.210. **PRICE**

**5/6**

## ECONOMY POWER PENTODE



All Editorial communications should be addressed to the Editor, POPULAR WIRELESS, Tallis House, Tallis Street, London, E.C.4.

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. Lile 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 specialties described may be the subject 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.

### THE "COSMIC" WITH AN ORDINARY TUNING CONDENSER.

A. L. (Rotherhithe, London, S.E.).—"As I cannot possibly run to the price of an Extenser, I was hoping to use an ordinary .0005 instead for tuning the 'Cosmic'."

"Is it possible to do this, as I have the condenser on hand? And also a 3-point and a 4-point wave-change switch."

"If so, please give the necessary wiring in words."

It can be done, using a 4-point switch of the type that separates all four contacts in the one position, and joins them all together in the other.

What you have to do is to join one of the contacts on the switch to the moving vanes of the tuning condenser, and then treat the other three contacts on the switch exactly as if they were the self-changer contacts on the Extenser, wiring them as shown on the blue print.

For the sake of clarity, we give the wave-change switch connections below. (Note that the switch must be a 4-point, of the kind described above.)

One switch contact to moving vanes of the .0005-mfd. variable condenser (and also to F of V<sub>1</sub>, V<sub>2</sub>, V<sub>3</sub>, etc., as shown on the blue print connected to moving vanes).

The second switch contact to the bottom terminal on the Moderator coil-quot.

The third switch contact to 3 on the dual-range coil.

The fourth switch contact to M on the Moderator condenser and to the number 1 terminal on the dual-range coil.

Don't forget that the new wiring should be as short as possible, and well spaced. And be sure to use only a 4-point switch of the right type, with a good, strong, positive action that makes firm contact at all four points.

### COUPLING THE OSCILLATOR.

M. W. E. (Brighton).—"My super-het has a band-pass unit in front of the first S.G., and the 'E' terminal of this does not go direct to earth, but goes via the (separate) coupling coil of an oscillator unit."

"Thus the oscillator coil is in the main aerial-earth lead, and it seems to me to be

(Continued on page 1510.)

## IS YOUR SET GOING WELL?

Perhaps the 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 an unrivalled service.

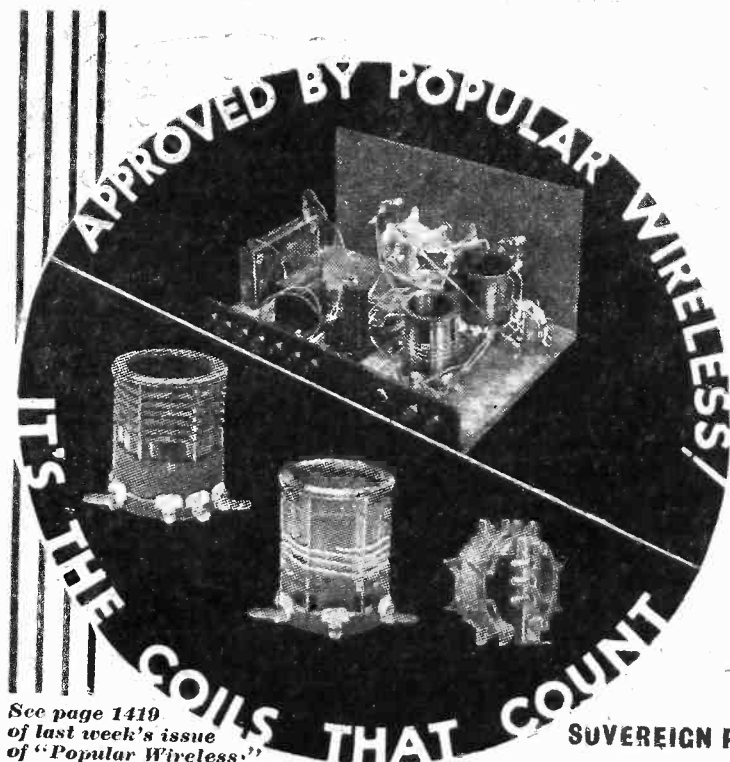
Full details, including scale of charges, can be obtained direct from the Technical Query Dept., POPULAR WIRELESS, The Fleetway House, Farringdon Street, London, E.C.4.

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.

# YOUR COSMIC III A SOVEREIGN SET

## —Build it with the Sovereign "Cosmic" Kit



See page 1419 of last week's issue of "Popular Wireless."

THIS is Sovereign time! Never before has such great value been offered in Kits for a "P.W." boom set. 90% of the components in the Sovereign "Cosmic III" Kit are made by Sovereign and the rest are equally reliable. The whole kit has the approval of "Popular Wireless." You have read what the wonderful "Cosmic" III will do—now build it with Sovereign—you will be astonished at the results. If you have difficulty in obtaining one of these Kits send direct to the makers. Remember, Sovereign is specified in the original "Cosmic" Sets.

Complete kit in sealed Sovereign carton less valves, cabinet and baseboard

# 52/6

Sovereign "COSMIC" Short-Wave Coil (specified in original "COSMIC" III STAR) 4/-  
Sovereign 100,000-ohms Spaghetti Resistance (specified in original "COSMIC" III) 1/3  
Sovereign "COSMIC" Dual-Range Coil (officially approved for both "Cosmic" Sets) 5/-  
Sovereign Moderator Coil (officially approved for both "Cosmic" Sets) 2/6  
Sovereign .00075-mfd. solid dielectric Condenser for tuning the Moderator Unit 3/-  
Sovereign .0003-mfd. Reaction Condenser 2/6

SOVEREIGN IS SPECIFIED IN BOTH "COSMIC" SETS THIS IS YOUR GUARANTEE

SEND FOR THE SOVEREIGN CATALOGUE—IT'S INVALUABLE TO "COSMIC" BUILDERS.

SOVEREIGN PRODUCTS LTD., 52/54, ROSEBERY AVENUE, LONDON, E.C.1

Telephone: Clerkenwell 2788/9.

S.F.



# ELECTRIFY YOUR SET WITH REGENTONE

—the experts' choice

Manufacturers of famous sets specify Regentone Mains Units for their sets. Experts have proved them satisfactory with the best kit circuits. The wireless press praises Regentone: for their efficiency; for their unfailing reliability; for their freedom from mains hum.

Electrify your radio with Regentone. You can get a Regentone Mains Unit for your set from 7/6 down—less than the cost of a new H.T. battery.

Write for the Regentone Art Booklet all-electric radio—or get it from your dealer.



## 7/6 DOWN

Regentone Model W.I.F. (H.T. only). Three tappings (S.G., Detector and Power). Output 120-150 volts. 12 m/a. Price 50/-

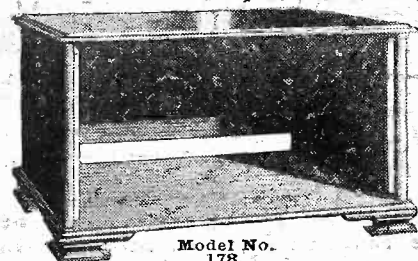
# REGENTONE

REGENTONE LIMITED, REGENTONE HOUSE,  
21 BARTLETT'S BUILDINGS, E.C.4.

Telephone: Central 8745 (5 lines)

Irish Free State Distributors: Kelly & Shiel, Ltd., 47 Fleet Street, Dublin

## This OSBORN RADIO CABINET SPECIFIED FOR THE "COSMIC" THREE



Model No. 178.

Model No. 178. Specified for the "Popular Wireless" "COSMIC THREE" A Radio Cabinet in Figure Oak or Mahogany, 14" x 7". Inside measurement, 10" from back to front, allowing ample room for baseboard. Opening at top. Fine workmanship throughout.

PRICES:—  
Machined Ready to Assemble: Oak, 7/-; Mahogany, 8/6.

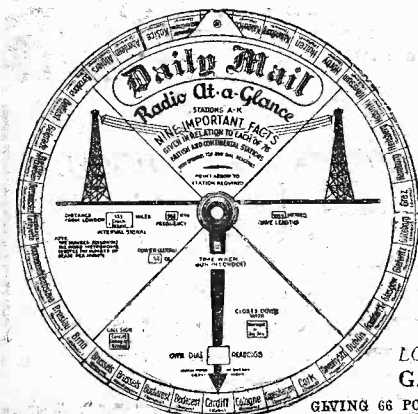
Assembled Ready to Polish: Oak, 10/-; Mahogany, 11/6.

Assembled and Polished: Oak, 13/-; Mahogany, 14/6.

All Models Carriage Paid. Send 3d. in stamps for new 1932 Beautifully Illustrated Catalogue.

CHAS. A. OSBORN,  
(Dept. P.W.),

The Regent Works, Arlington St., London, N.1. Telephone: Clerkenwell 5095, and at 21, Essex Road, Islington, N.1. Telephone: Clerkenwell 5634.



## IDENTIFY FOREIGN STATIONS

AND LOCATE THEM IMMEDIATELY WITH THE AID OF THIS CLEVER RADIO WHEEL WHICH IS A HANDY AND PERMANENT RECORD AND CAN BE HUNG ON YOUR WIRELESS SET. DOUBLE SIDED. DIAMETER 10 INS. 1/-

LOOK OUT FOR THE NEW WHEEL GARDENING "At-a-Glance"

GIVING 66 POPULAR ANNUALS AND VEGETABLES. PRINTED AND ILLUSTRATED IN 8 COLOURS.

At all Stores, Stationers, Bookstalls, etc., or if any difficulty write direct to FRANK PITCHFORD & CO., LTD., WELL ST., LONDON, E.C.1



PRICE 14/6  
FOR BEST  
RESULTS  
use only

**FORMO**  
ARTHUR PREEN & CO. LTD.

**EXTENSER  
CONDENSER**  
OFFICIALLY SPECIFIED FOR  
"COSMIC III"

FREE!

Wiring diagram sent on request. Write to

ARTHUR PREEN & CO., LTD.,  
Golden Sq., London, W.1.

## RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 1508.)

possible to take it out and couple it instead to the second band-pass circuit via the reaction winding there, which is not used.

"I presume I should use a condenser to couple it. Do you think it would be worth trying, and, if so, what value of condenser?"

It would certainly appear to be worth trying, as the alteration is very slight, and it might result in a cleaned-up input. Any small fixed condenser would do, say, .0002. (In many cases no condenser is needed, but it would be safer to use one.)

### USING A MILLIAMMETER TO CHECK TUNING AND OTHER ADJUSTMENTS.

D. R. (Cranbrook Park, Hford).—"I have got a milliammeter connected in the plate circuit of the detector of my three-valve set, which is an H.F. Det. L.F., using A.C. valves.

"I cannot understand the working of this, as regards a check on tuning, and should be glad of your explanation. As stated in 'P.W.',"

tuning condenser, I can make the milliammeter drop perhaps .1 of a milliamp by careful adjustment of this control. Then I can drop it still another .1, or perhaps .2, by adjusting aerial tuning also.

"In addition, I have a selector coil, and when this is adjusted (leaving the other two alone) I can get yet another drop in the reading, accompanied also (as in the other cases) by stronger reception as I get exactly in tune on the selector.

"There is also a potentiometer controlling the screen volts, and adjusting this will often cause a still further decrease in plate current of the detector.

"Finally there is a selectivity condenser, which also affects the milliammeter. Why do all these controls cause detector plate current to drop?"

"It certainly makes exact adjustments possible, but I should like an explanation, as throwing any one of them out shows up by a slight movement on the milliammeter needle at once, whilst taking the aerial off of the switching off of the station causes quite a tremendous rise in plate current. Why is this?"

### "P.W." PANEL. No. 61. ACCUMULATOR ACID.

The electrolyte for accumulators is dilute sulphuric acid, which is poisonous and corrosive.

If spilt on a carpet, on clothes, curtains, or similar fabrics, it will quickly "eat away" the material.

Should such an accident occur, the spilt acid must be "neutralised" by liberal applications of ammonia, or washing soda, followed by plentiful washing in clean water. Such treatment will completely remove the danger of damage.

I find that the plate current is reduced—quite a lot—when I tune in a strong programme. But there are no less than five controls on the set which can be made to affect the detector's plate current in this way.

"For instance, if I tune in London Regional roughly, by ear, and then adjust the H.F.

You are observing some very interesting effects when tuning with a sensitive milliammeter in the detector circuit as described.

What is happening may be briefly accounted for as follows:

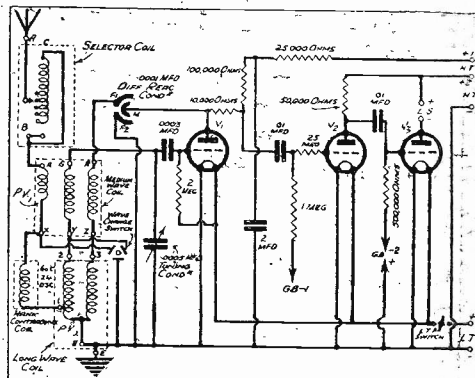
With no programme tuned in the detector plate current will be a certain value, say, 2 milliamps. But if a station is tuned in, its carrier-wave has the effect of setting up a voltage on the detector's grid, and (in

the case of the ordinary grid leak and condenser arrangement) this received voltage causes the detector plate current to decrease.

When the detector's grid circuit is brought exactly in tune with the received impulses the voltage developed at the grid is greater than when the circuit

### MISSING LINKS No. 29

A GOOD THREE-VALVER.



This diagram shows the two "components" that were purposely omitted from last week's diagram.

It will be seen that one was a 1-megohm grid leak, and the other a 25-megohm resistance used as an H.F. stopper between the grid leak and the grid.

is slightly out of tune, so exact adjustment is possible by watching the needle's response.

Similarly, the aerial-circuit tuning supplies greater voltages to the following stage when it, too, is brought exactly into tune. By correctly tuning this stage you cause the detector plate current to drop still farther.

By adjusting the selector you carry the process a step farther, and a further slight drop in anode current results because the aerial delivers maximum voltage when brought exactly in tune.

All the foregoing adjustments have derived the extra sensitivity from accurate tuning. But extra

(Continued on page 1512.)

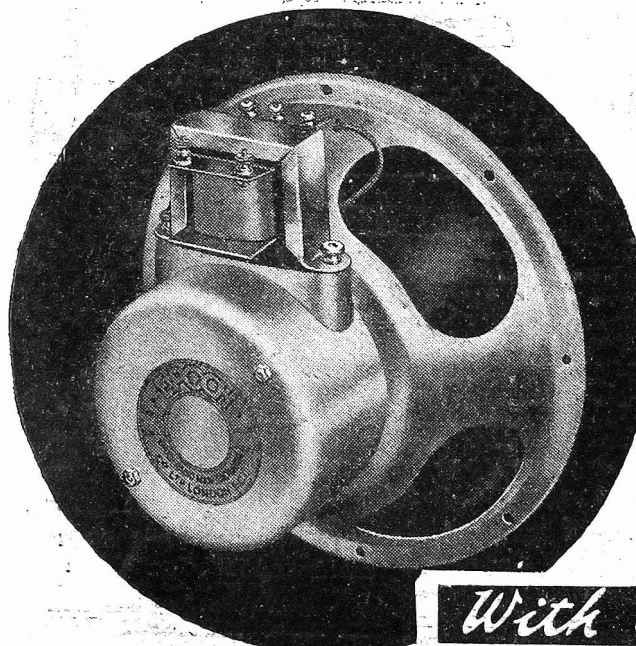
# EPOCH

PERMANENT MAGNET

SPECIFIED FOR THE COSMIC III

REAL PIONEERS—YEARS AHEAD

in experience, research and design



**MODEL J.1.** 18 months before the many so-called pioneer claims to the production of the Permanent Magnet Moving-Coil Speakers, Epoch designed, developed and manufactured the first practical Permanent Magnet. Epoch's leadership in this class is definitely established by a new standard of comparison for performance and price set by Model J.1. The lowest price 9% cobalt steel Permanent Magnet Moving-Coil Speaker on the market. Comparable to instruments costing pounds more. The 3-Ratio Transformer fitted makes it ready to work instantly from any set with Pentode or Super Power output. When purchasing a Moving-Coil insist upon EPOCH.

Send for Free Art Booklet P.S.5.

Complete with aluminium covered cobalt steel magnet, one-piece moulded linen diaphragm and 3-ratio input transformer. Ask your dealer for it. He will gladly demonstrate this or any Epoch Model. If you have any difficulty send for nearest dealer's name or call at our new showrooms and hear it.

**THE LATEST MODEL. 1 lb. HEAVIER MAGNET. EXTRA-ORDINARILY SENSITIVE. NO ADVANCE IN PRICE.**

**EPOCH RADIO MANUFACTURING CO., LTD.,** EXMOUTH HOUSE, EXMOUTH STREET E.C.1

At the junction of Rosbery Avenue and Farringdon Road

With 3-Ratio Input Transformer

45/-

(Complete with 3-Ratio Input Transformer.)



# GOLTONE COILS

**FOR "COSMIC" CIRCUITS**

FULLY APPROVED AND SPECIFIED BY DESIGNER

Insist on "GOLTONE" original "P.W." COSMIC COILS which have been designed to obtain best possible results.

Obtainable from all First-Class Radio Stores—**REFUSE SUBSTITUTES**

If any difficulty write direct.

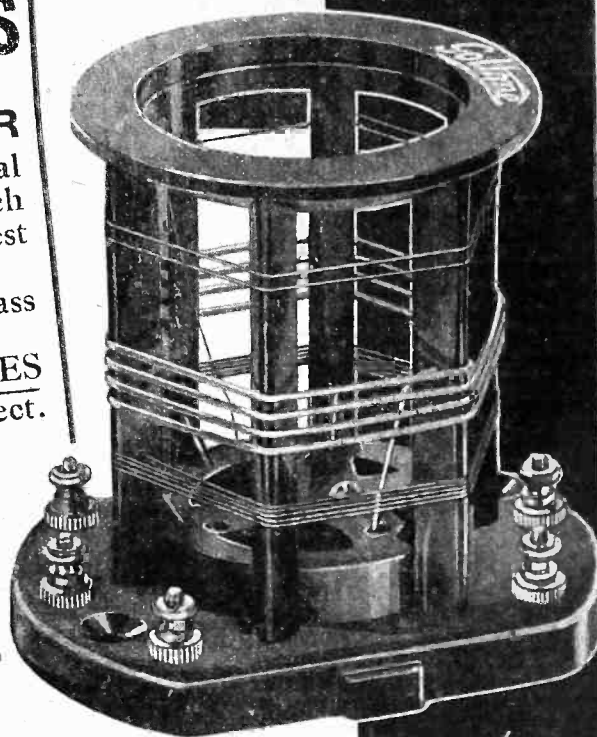
Radio Catalogue Sent On Request

MODERATOR COIL  
AS SPECIFIED  
GM.26 2/6

ONLY  
**10/-**  
PER PAIR  
OBTAINED IF SEPARATELY DESIRED.  
DW/19 - 4/6  
DW/18 - 5/6

**IMMEDIATE DELIVERY**

**Ward & Goldstone**  
PENDLETON MANCHESTER



DW/19

**Will Day**  
LIMITED

*The Best in the West*

for the

**S.T. 300**

**COSMIC THREE**

**COSMIC THREE STAR**

**AUTOTONE**

and the

**QUADRADYNE**

*London's Telsen Stockists*

**WILL DAY, LIMITED,**

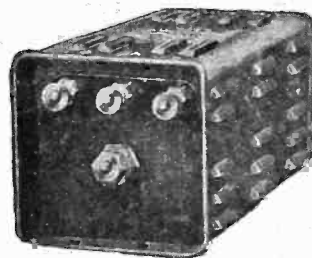
**19, Lisle Street, Leicester Square,**

**London, W.C.2** Telephone: Gerrard 4476.

**WESTINGHOUSE**

**A CONSTANT H.T. SUPPLY**

H.T. 6  
METAL  
REC-  
TIFIER



OUT-  
PUT  
175 v.  
25 mA.

Price 15/-

Your radio set demands ample, steady and silent current. Without it, reception and reproduction are bound to suffer. Give it what it wants by using an eliminator incorporating

**THE WESTINGHOUSE METAL RECTIFIER**

which ensures a permanent and adequate H.T. supply.

All the best eliminators are fitted with Westinghouse Metal Rectifiers. Our booklet "The All-Metal Way" contains full particulars, together with circuits and details for building eliminators. The attached coupon and 3d. in stamps will bring you a copy.

COUPON

WESTINGHOUSE PUBLICITY, 82, York Road, King's Cross, London, N.1.

Please send me a copy of your booklet, "The All-Metal Way," for which I enclose 3d. in stamps.

NAME.....

ADDRESS.....

P.W. 5-3-32

**The WESTINGHOUSE BRAKE & SAXBY SIGNAL Co.Ld.**  
82, YORK RD., KING'S CROSS, LONDON, N.1

## RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 1510.)

sensitivity can also be obtained by correct setting of the screening-grid voltage.

When this is done the voltage amplification by the S.G. valve will be increased, and this, too, will have the effect of building up the voltage on the detector's grid. The effect on plate current will be another decrease.

Note that the more sensitive you make the set the more the plate current falls. Any slight mistuning will cause it to rise a little, and thus, in the arrangement you are using, you have a valuable check on the working of the various H.F. controls.

You can get far more accurate tuning this way than by ear, so it is particularly useful for preparing tuning curves, etc.

### CONNECTIONS OF A DOUBLE-GRID VALVE.

"DOUBLE-GRID" (Chesterfield).—"Could you give me some information about the new double-grid or 'Bi-grid' valves which are now being used? I have never seen it stated, but I want to know:

(a) The order of the electrodes inside the valve, i.e., whether control grid is placed nearer to the filament or to the plate?

(b) Is the extra terminal connected to one of the grids or to plate? (I presume the actual pins are as near as possible like ordinary valves, with the filaments and possibly grid or plate connections as in other valves?)."

Regarding (a), the order of the electrodes is, first, filament, next extra grid, next control grid, and finally plate.

(b) The extra terminal or fifth pin is joined to the extra grid, and thus all the other electrodes correspond with those of an ordinary valve, namely, two filaments, and in line between them the grid (nearer) and opposite this the plate.

### A PRICE CORRECTION.

The price of the "Atlas" Mains Unit D.C. 15/25 is 39s. 6d., and not 35s. 6d. as we were given to understand in the original specification.

### TWO TRANSFORMERS IN "ECONOMY" THREE.

P.L. G. (Great Yarmouth).—"My set is the famous 'Economy' Three, and although it has been going good for over a year it is still a wonderful proposition for long distance and good quality. A friend has asked me about building a similar set for him, but he wants to make a slight change in it.

Instead of using R.C.C. between the detector and first valve, and a transformer between the other two valves, he wants to employ two transformers, one in each plate circuit. Would this be quite O.K., or do you think that the resistance is better?

we strongly advise you *not* to make the change suggested in the "Economy" Three.

Our reason for this is that the set, as its name implies, was built as a low-cost receiver, with the very minimum of expensive apparatus, etc. And such a change as you suggest would be liable to upset the stability of the set.

You might find that it would tend to "motor-boat" or be unstable, or produce unpleasant quality compared with your own receiver, all of which could have been avoided by sticking to an R.C.C. unit for the low-frequency stage in question, instead of using two transformers as suggested.

### "KNOCKING OUT THE TWINS."

G. V. C. (Huddersfield).—"I am told that the best way of knocking out the twins, when searching for distant stations, is to put in a

## NEXT WEEK

### FINDING THOSE FOREIGNERS

A long, illustrated article dealing with the fascinating subject of station identification.

### A TALK WITH A SPANISH LISTENER

Intimate, interesting and informative.

### PICK-UP PROGRAMMES ON THE "COSMIC"

ORDER YOUR COPY NOW ON SALE NEXT THURSDAY

POPULAR WIRELESS - PRICE THREEPENCE

"We should connect the markings on the transformer exactly the same as the markings on the resistance-capacity unit, which we understand is quite O.K."

So far as electrical connections go it is quite O.K. to connect up the corresponding points in a low-frequency transformer to those formerly occupied by a resistance-capacity coupling unit. Nevertheless,

Brookmans Rejector, like the one described in 'P.W.' when the London station was new. It was one in which two plug-in coils were used, and the tuning condensers were of the solid dielectric kind, with switches mounted beside them to cut off one or other station, as necessary.

(Continued on page 1514.)

# "NEW SETS FOR OLD"

BE UP-TO-DATE WITH 1932 ALL-MAINS OR BATTERY SET, YOUR OLD SET BEING TURNED INTO MONEY AND TAKEN IN PART-EXCHANGE. Any make of Radiogram, Set or Kit supplied, balance in Cash or Hire Purchase. Home-made sets accepted, but not parts or components.

## BEST ALLOWANCES GIVEN FOR SETS ONLY

Send for testimonials from satisfied clients from all parts of the world, enclosing 1½d. stamp for reply.

PLEASE INFORM US OF YOUR WANTS BY FORWARDING THIS FORM.

### ENQUIRY FORM (Without obligation)

To RADIALADDIN Ltd. (Dept. P.W.), BERNERS HOUSE, BERNERS STREET, LONDON, W.1.

I am interested in purchasing the undermentioned Radio Receiver:—

Make ..... Mains or Battery .....

Model ..... Valves ..... Remarks .....

Present set: Make ..... Mains or Battery ..... Valves .....

Date of purchase ..... Present condition .....

Original cost of set ..... Whether new when purchase .....

Balance of purchase price would be payable by me as follows:—

Plan A. Whole of balance in cash. Plan B. Whole of balance over (Six, Nine, Twelve\*) months.

\* Delete unwanted words.

N.B.—An extra charge is made for Hire Purchase facilities.

NAME (in full), (Block Letters) .....

ADDRESS .....

# RADIALADDIN LTD.,

THE LARGEST RADIO EXCHANGE DEALERS IN THE U.K.

(Dept. P.W.), 47, Berners Street, London, W.1.

Telephone: Museum 1821.



# Deal for Short-Wave Work

Chosen  
for use  
with the  
COSMIC III  
Short-Waver



## ERICSSON TELEPHONES

It is to be good to be chosen for use with the COSMIC III Short-Waver. Found on every DX fan's bench. Clear, pure and sensitive. Extremely comfortable in wear during long calls at the dials.

All good dealers stock them, or direct from

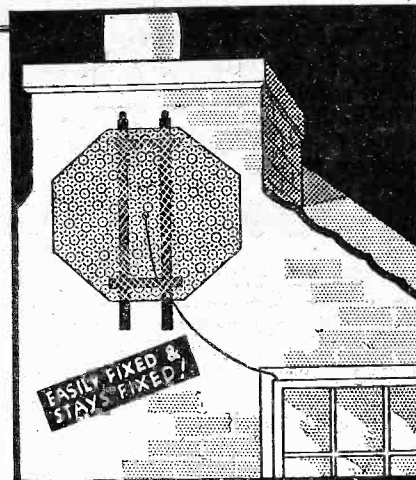
**ERICSSON TELEPHONES, LTD.**  
67/73, Kingsway, London, W.C.2.

20, 2,000  
and  
5,000 ohms.

**2/6** *Ericsson* **BRITISH  
SUPERSENSITIVE  
TELEPHONES**

# Why the new ELECTRON SCREEN AERIAL

is a tremendous  
advance upon the  
old-type Mast!



Size: 22" x 21". Master Patent No. 260089.

- ★ **SCIENTIFIC.** The Patent Electron Screen Aerial is a scientifically constructed metal plate mounted on a strong wooden frame, and is designed to "pick up" the ether flow to a maximum.
- ★ **SIMPLE.** The Aerial can easily be fixed to a high part of the house in a few minutes. Very good results are also obtained by suspending it in the loft.
- ★ **SELECTIVE.** The Aerial is in advance of any other, and its highly sensitive properties ensure both selectivity and Volume.
- ★ **SECURE.** Once fixed, it stays fixed. Each outfit is supplied with 4 large galvanised nails. No more fear of storms, as the Screen Aerial instantly becomes a permanent fixture.
- ★ **Guarantee.** We wish to emphasise that UNLESS better results are obtained than from your existing Aerial, your money will be refunded instantly without question.

**ELECTRON  
INSULATOR  
PINS**

**6d.**  
per box of  
**6**

With these pins a directional aerial can instantly be obtained by fixing at different angles across the room. Various colours available in Oak, Mahogany, Black or White, to match your decorations.

For your lead-in always use **SUPERIAL**. 75ft. 2/6. 100ft. 3/6. 50ft. 1/9. 25ft. 1/-.

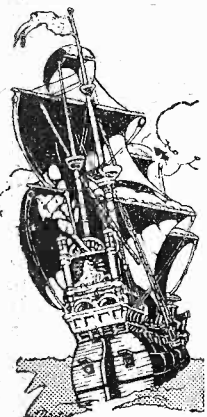
**The NEW LONDON ELECTRON WORKS Ltd**  
Telephone: Grange Road 1408/9. 19 EAST HAM, LONDON, E.6  
Telegrams: Stannum, London

**15/-**  
CARRIAGE 9D

# The BEST Magazine value in the WORLD!

Such is the ARGOSY MAGAZINE, every issue of which is packed with a wonderful selection of the world's best fiction. The short story—highest form of prose-writing—is well represented. Every issue contains examples from the pens of the masters. The novel?—that, too, has its place in THE ARGOSY, for there is a complete book-length novel in every number. If you appreciate cultivated fiction you will appreciate

**THE  
ARGOSY**  
Magazine - - Monthly - - 1/-

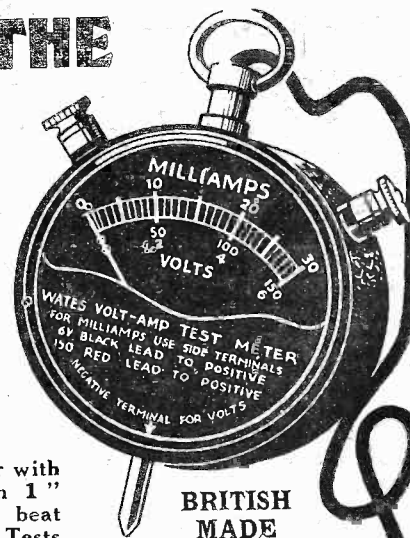


# BY TEST THE

**Best  
FOR  
EVERY  
TEST**

Be your own radio doctor with the famous **Wates "3 in 1" Pocket Meter**. Its dead beat accuracy finds every fault. Tests L.T. (0-6 volts): H.T. (0-150 volts): Current consumption (0-30 milliamps). High resistance. All readings on one dial. This proved best meter is **BRITISH** made and finest value for your money. Ask your radio dealer or send for details.

**STANDARD BATTERY CO.,**  
184-8, Shaftesbury Ave., London, W.C.2



**BRITISH  
MADE**

Of all Radio  
Dealers or direct from us. **8/6**

Smart Push lined  
Case, if required. **1/9**  
extra.

★ **WRITE FOR  
EXPLANATORY  
LEAFLET**

**WATES 3 in 1  
POCKET METER**

## RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 1512.)

"Could you give me a list of the parts necessary and the internal connections?"

All you need is a couple of terminals (A1 and A2), a couple of on-off switches (S1 and S2), one .0003 fixed condenser, one .0005 variable condenser, and two .00075 variable condensers. You will also need two plug-in coil holders, and the necessary coils for the wave-band on which you wish to use the wave-trap. Suitable coils for your case would be one 50 and one 60 or 75 X coil. The connections are as follows:

The A1 terminal goes to the moving vanes of the .0005 variable condenser, to the fixed vanes of one of the .00075 variable condensers, and also to one side of the .0003 fixed condenser. The remaining side of this fixed condenser is connected to the remaining side of the .00075 condenser, and also to the plug of one coil holder, and to one side of the S1 switch.

The other side of this switch goes to one side of the other switch, to the socket of the coil holder referred to above, to the remaining side of the .0005 variable condenser, and also, by a flexible lead, to the tap on the coil which will be placed in the other coil holder.

The pin end of this second coil holder is joined to the remaining side of S2, to the A2 terminal, and to the fixed vanes of the second .00075 variable condenser. The moving vanes of this condenser are joined to the other side of the second coil holder, and that completes the connections.

The aerial is then joined to A1, and the A2 terminal goes to the aerial terminal on the set.

### THE S.G. BY-PASS CONDENSER.

P. C. A. (Lincoln).—"What is the object of having a large fixed condenser connected to the screen of an S.G. valve when it is effectively isolated in the valve itself and is not supposed to carry any current from the distant stations?"

The screen of the S.G. valve needs a fairly high voltage on it from the H.T. battery in order that it may work correctly, and thus it is joined to H.T. positive, generally via a resistance. The other end of the H.T. supply will be connected to earth, and normally a steady current will flow from the battery through this resistance developing a small voltage across it.

This might not be detrimental. But if high-frequency currents started to flow across the resistance (as they might easily take it into their heads to do), they would give rise to high-frequency voltages on the screen which would upset the working of the valve. It is to prevent this possibility that the by-pass condenser is used, and it is joined right across between the screening-grid and filament in the case of battery valves, or to the cathode circuit in the case of A.C. valves.

Such a condenser has very little impedance from a high-frequency point of view, and is almost equivalent to short circuiting the grid to the earth, which is

## TECHNICAL TWISTERS

### No. 103.—CONNECTING CELLS IN SERIES.

CAN YOU FILL IN THE MISSING LETTERS?

When similar cells are joined in series the ..... of each will be added to the other's, so the total ..... will be that of one multiplied by the number of cells.

The current supplied by such an arrangement is not increased, and is approximately the same as that obtainable from .....

The ordinary high-tension battery consists of a number of 1½-volt units joined in series, and thus in a 60-volt battery there are ..... cells.

A disadvantage of the series connection is that one defective cell renders the whole ..... faulty.

Last week's Missing Words in order were: Voltage, Voltage, Capacity, Number, Sixty, Two, Current.

exactly what is required to prevent H.F. voltage differences appearing there and upsetting the operation of the valve.

As far as the high tension is concerned the condenser, of course, acts as an insulator, and it is, therefore, possible to arrange the steady voltage on the screen to the desired potential without shorting the battery, at the same time maintaining the screening grid effectively earthed so far as high frequency is concerned.

### CONNECTIONS FOR THE DUAL RANGER.

5 P. V. (Plymouth).—"As a regular reader of POPULAR WIRELESS I would like a little information. I have built the Dual Ranger, but I cannot get it to work properly. I do not seem to see the wiring on my coil quito. The one on your blue print is lettered, but mine is not. It has got three leads, a black, a green and a white. There are also two tappings.

"And could you tell me why there is a copper foil on some three valve sets and not on others?"

The coloured leads mentioned correspond to the following connections. Black = L.T. neg. and earth, green = reaction, white = grid.

Copper foil is used to prevent the magnetic fields surrounding the various coils, etc., from reaching out and affecting other parts of the circuit where they are not wanted.

There are various reasons why it is not always necessary to use copper foil, but generally speaking it is required when very high magnification is being handled (in such cases the fields from the coils reach out a comparatively long way), and when there is not much room to spare inside the set so that the components have to be placed rather closer together than is normally desirable.

Generally the multi-valve sets must have copper shielding, etc., because the more power that is being handled the more necessary it becomes to keep down this unwanted feed-back from one part of the set to another.

### THE "COSMIC" 3.

"Cosmic" builders are reminded that a large free wiring diagram showing the exact wiring for the "Formo" Extender in the above circuit can be obtained from the makers on request.

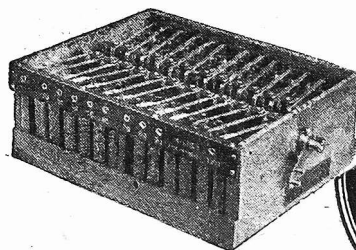
Applications should be addressed to Arthur Preen & Co. Ltd., Golden Square, London, W.1.

Say  
Player's  
please



They always do!

N.C.C.60



HIGH  
TENSION  
FOR  
practically  
NOTHING

MILNES  
H.T. SUPPLY UNIT

LET YOUR  
LOW-TENSION  
ACCUMULATOR  
PROVIDE YOUR  
HIGH-TENSION  
CURRENT—

Many People have  
already scrapped  
their  
ELIMINATORS  
in its favour.

90 Volts  
£2.19.6  
120 Volts 150 Volts  
£3.19.6 £4.19.6  
In the United Kingdom.

Write To-Day for Full Particulars:—

MILNES RADIO CO.  
Cottingley Bridge, BINGLEY-YORKS.

'Phone: Bingley 500.

THE Unit consists of indestructible nickel iron cells which are kept charged automatically from the L.T. accumulator—by means of a series-parallel switch—thus supplying a steady and ample stream of H.T. Current. The L.T. Accumulator will require very little more charging than formerly. It seems too good to be true—but, nevertheless, it is. Absolutely abolishes H.T. worries. The "Alkum" nickel and iron plates are entirely free from the trouble customary with lead plates. Sulphation is impossible and cells cannot be damaged by any rate of charge or discharge. Will supply 40 milliamps per hour.



# MIRROR OF THE B.B.C.

(Continued from page 1506.)

hear Leonard Henry sponsoring a farlesqued American programme on Monday, March 7th: while on Saturday, March 12th, there is another of the popular entertainments by Street Artistes.

## Music Hall."

Quite a new experiment in broadcast theatre presentation will be tried at the large studio at Big Tree Wharf on the north side of Waterloo Bridge on Saturday, March 26th, when the artistes will "do their stuff" on a stage with the orchestra below them and the microphone strung in the air.

The programme is appropriately entitled "Music Hall," because it will approximate more to an actual music-hall relay, but combining the advantages of studio acoustics and a fairly big audience in front of the performers instead of, as happens at Savoy Hill, being located behind the players. Eight separate turns will be booked for the show, the intervals between being filled with music provided by the B.B.C. Theatre Orchestra.

## Crown For Sale."

"Crown for Sale," an operetta which, as mentioned last week, has been specially written by Denis Freeman and Mark

## PLAYING THOSE RECORDS!

Don't fail to order next week's "P.W." in which will appear a long article on PICK-UP PROGRAMMES ON THE "COSMIC" THREE.

OUT ON THURSDAY. USUAL PRICE.

subbock to suit the personality of Violet, oraine, and performances of which are to be given on Friday and Saturday, March 11th and 12th, is a story which promises well for microphone drama.

It concerns an American millionairess who having agreed to save a small central European kingdom from bankruptcy by marrying the Crown Prince, decided to change her mind at the last moment and try a President, because she thinks that republics are more economical to run. The an begins when she sends her English maid, whose part will be taken by Miss oraine, to break the news to the Prince.

She is mistaken for her mistress and recorded a public reception. In such a story other complications are, of course inevitable; but I think I have divulged enough to whet the appetites of most listeners.

## Better Relays.

The installations of special broadcast circuits by the Swiss authorities between their leading cities has resulted recently in greatly improving the relays from Geneva of international importance. What are called "music quality" circuits, that is lines that have a sufficient range of frequencies to allow of the faithful transmission of music, are now available from London to Geneva.

# New Times Sales Co

## OFFER THE EASIEST TERMS FOR EVERYTHING YOU WANT IN RADIO

**R. & A. "100" PERMANENT MAGNET MOVING-COIL SPEAKER** With multi-ratio input transformer. Cash Price £2 17s. 6d. Balance in 11 monthly payments of 5/4.

With 5/4 order

**BLUE SPOT SPEAKER UNIT AND CHASSIS.** Type 100 U. Cash price £1 19s. 6d. Balance in 7 monthly payments of 5/5.

With 5/5 order

**BLUE SPOT SPEAKER UNIT 66R** with Major Chassis and Cone (37 cm.) Cash price £2 10s. 0d. Balance in 11 monthly payments of 4/7.

With 4/7 order

**AMPLION MOVING-COIL SPEAKER, TYPE M.C.6.** Permanent magnet, with output transformer. Complete. Cash price £3 7s. 6d. Balance in 11 monthly payments of 6/2.

With 6/2 order

**EPOCH PERMANENT MAGNET MOVING-COIL SPEAKER.** Type A.2. Cash price £3 3s. 0d. Balance in 11 monthly payments of 5/9.

With 5/9 order

**W.B. PERMANENT MAGNET MOVING-COIL SPEAKER, TYPE P.M.3.** With 3-ratio input transformer. Cash price £2 12s. 6d. Balance in 11 monthly payments of 4/10.

With 4/10 order

**CELESTION PERMANENT MAGNET MOVING-COIL SPEAKER.** Type R.P.M.8, with 8-in. reinforced diaphragm. Excluding input transformer. Cash price, £3 10s. 0d. Balance in 11 monthly payments of 5/5.

With 6/5 order

**CELESTION P.P.M. PERMANENT MAGNET MOVING-COIL SPEAKER** with impregnated diaphragm and dual impedance input transformer. Cash or C.O.D. £2 7s. 6d. Balance in 7 monthly payments of 6/6.

With 6/6 order

**PILOT PERMANENT MAGNET MOVING-COIL SPEAKER,** in handsome solid oak cabinet with multi-ratio input transformer. Cash or C.O.D. £3 15s. 0d. only. Balance in 11 monthly payments of 6/11.

With 6/11 order

**ULTRA IMP PERMANENT MAGNET MOVING-COIL SPEAKER.**

WITH 5/- ORDER

Complete with input transformer. CASH PRICE £2 : 15 : 0

Balance in 11 monthly payments of 5/-

**ATLAS A.C. ELIMINATOR, TYPE A.C.244.** Three tappings, S.G. Detector, and Power. Output, 120 volts at 20 m/a. Cash price £2 19s. 6d. Balance in 11 monthly payments of 5/6.

With 5/6 order

**REGENTONE W.5A COMBINED H.T. ELIMINATOR AND TRICKLE CHARGER.** One adjustable S.G., 1 variable and 1 fixed tappings for H.T. L.T. charging for 2 and 6 volts. For A.C. mains. Cash price £4 12s. 6d. Balance in 11 monthly payments of 8/6.

With 8/6 order

**REGENTONE W.I.F. H.T. ELIMINATOR.** Tapped 60/70v. S.G., and 120v. at 12 m/a. Cash Price £2 7s. 6d. Balance in 11 monthly payments 4/4.

With 4/4 order

**EKCO K.12 H.T. ELIMINATOR AND L.T. TRICKLE CHARGER.** Delivers 12 m/a. Tapped at 80 v. (S.G.), 120/150 v. Charges 1-amp. at 2, 4, or 6 v. Cash price £3 19s. 6d. Balance in 11 monthly payments of 7/2.

With 7/2 order

**EKCO H.T. UNIT.** Type A.C. 25. For multi-valve sets requiring up to 25 m/a. 3 tappings, S.G., detector and 120/150 volts. For A.C. Mains. Cash or C.O.D., £3 17s. 6d. Balance in 11 monthly payments of 7/1.

With 7/1 order

**GARRARD INDUCTION GRAMOPHONE MOTOR.** Model 202. For A.C. Mains. Mounted on 12-in. Nickel Motor Plate with fully automatic electric starting and stopping switch. Cash price £2 18s. 6d. Balance in 11 monthly payments of 5/4 only.

With 5/4 order

**EXIDE 120-VOLT, W.H. TYPE ACCUMULATOR,** in crates. Cash price, £4 13s. Balance in 11 monthly payments of 8s. 6d.

With 8/6 order

**NEW B.T.H. "SENIOR" PICK-UP AND TONE-ARM.** Complete. Cash price £2 5s. Balance in 11 monthly payments of 4s. 2d.

With 4/2 order

## TELSEN TRIPLE THREE

Kit of parts less valves, cabinet, base-board, panel, wires, flex, and screws. Cash price £2 12s. 6d. Balance in 6 monthly payments of 8/3.

With 8/3 order

## COSSOR 234 EMPIRE MELODY MAKER

Screened Grid. Detector and Power. With Valves and Cabinet. Cash price £6 15s. 0d. Balance in 11 monthly payments of 12/6.

With 10/- order

## COSSOR MODEL 235 ALL-ELECTRIC

S.G., Detector and -Power. Complete with Valves and Cabinet. Cash Price £9 19s. 6d. Balance in 11 monthly payments of 18s. 3d.

With 18/3 order

## V.3 RADIO FOR THE MILLION

With Valves less Cabinet. Cash price £5 17s. 6d. Balance in 11 monthly payments of 10s. 10d.

With 10/- order

## READIRAD METEOR 3

Less Valves and Cabinet. Cash price £3 15s. 0d. Balance in 11 monthly payments of 6s. 11d.

With 6/11 order

## FORMO ECONOMY 3

With Coils less Valves and Cabinet. Cash price £1 19s. 6d. Balance in 7 monthly payments of 5/6.

With 5/6 order

## OSRAM NEW MUSIC MAGNET FOUR

With Valves and Cabinet. Cash price £10 15s. 0d. Balance in 11 monthly payments of 19/8.

With 19/8 order

C.O.D. orders over 10/- sent post and C.O.D. charges paid.

To NEW TIMES SALES CO. 56, Ludgate Hill, London, E.C.4

Please send me

I enclose..... s. ....d. as first

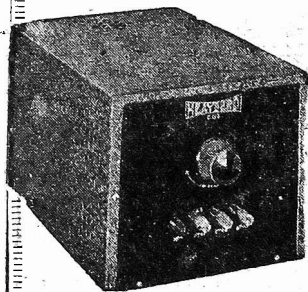
payment for.....

NAME .....

ADDRESS .....

P.W. 5/3/32.

## "FAULTLESS SERVICE"



"Fourteen months ago I purchased a Heayberd C450 Eliminator which has given Faultless Service," wrote F. E. H. from Yarmouth, when placing a further order. "With such excellent components, Faultless Service is assured."

Model C.150. Output: 150v. at 25 ma. Tapings: 60/80v. Var. S.G., 120v. and 150v. fixed. Westinghouse Rectification. Assembled in neat steel case ready for wiring-up.

**PRICE 76/- ONLY**

**GUARANTEED THREE YEARS**

**POST NOW**

I enclose 3d. in stamps for instructive lists, with circuit diagrams of Heayberd mains transformers.

M.....  
Address.....

# HEAYBERD

MONARCH OF THE MAINS.

10 FINSBURY ST., LONDON, E.C.2  
(One minute from Moorgate Und. Stn.)



**PICKETTS**  
**PIANO TONE**  
**CABINET**  
**For YOUR Radio**

USED BY "B.B.C."  
"Famous Engineers,"  
and "Leading Experts"

The sort people desire to possess and keep. Tasteful beauty—Piano finish—advantages also of **PIANO TONE** baffle chamber. The **BETTER REPRODUCTION** that your Set is really capable of gives you a joyous sense of achievement. Mellow, rich tone of piano soundboard. Sent **ON APPROVAL** direct from the makers. Prices 35/- to £15 (Cash or Easy Payments). You may return at our expense if you wish to part with it. Photographs and List **FREE!**  
**PICKETTS, Radio Furniture (P.W.),**  
Albion Road, Bexleyheath, Kent.

## EXACT TUNERS

250 to 2,000 metres.  
Thousands of these tuners are in use, and we can strongly recommend them. No further coils are required. Send P.O. for particulars and circuits—**FREE!**

**THE EXACT MANUFACTURING CO.,**  
Croft Works, Priory Street, Coventry.

## LOUD SPEAKERS REPAIRED, 4/-

(Blue Spot a Speciality, 5/-)

Transformers 4/-; Headphones 4/-; all repairs magnetised free. Tested, guaranteed, and ready for delivery in 24 hours.

**Discount for Trade.** Clerkenwell 9069  
**E. MASON, 44, EAST ROAD, N.1.**

Make  
**The DAILY SKETCH**  
YOUR Picture Paper

## THE LISTENER'S NOTEBOOK

(Continued from page 1506.)

become less important still as the weeks pass. Such noises must lose their novelty with repetition, and, consequently, become stale.

And the conversations themselves. Though they are good, I think that, at times, they might be more topical. Wouldn't it be truer to life to hear folk discussing a play, a film, a big race that is coming on, or football—in fact, why not have a medley of sport talk? After all, isn't this what people do almost invariably discuss in a train on a Saturday night?

Have you noticed how popular the word "fundamental" is with speakers nowadays? It would be unique to hear a talk in which this word did not occur. Sir A. Salter is the latest to follow the fashion.

When is Mr. Desmond McCarthy going to mention a new book in his "New Books" talks? He never mentions one in a blue moon. Fancy dealing with Pepys Diary in a talk entitled "New Books"!

"Mass of Life."

Of the week's music I suppose Delius' "Mass of Life" would be considered the big thing. Personally, I couldn't stand more than half an hour of it. It was too complex for me, and far beyond my comprehension. I needed enlightenment.

Consequently, I gave it up in favour of Mr. Joseph Lewis's Community Singing programme. Here I was pleasantly entertained. Mr. Lewis has a most agreeable voice, and seems born for his job. His wit is sparkling, which the National Chorus seemed to appreciate as much as we did. By the way, who was the enthusiastic tenor who came in a-bar or two too soon in "Jerusalem"? If Bateman was listening, I'm sure this incident will inspire a new picture with the title "The Tenor Who—"

The only adverse criticism I have of the Community Singing item is that Mr. Lewis seemed inclined to forget his unseen choir. His back was too often to the microphone, with the result that we missed a lot of his small-talk. The National Chorus laughed heartily, but we were often left guessing.

What a lot of Mozart we are having lately! I wish they weren't so prone to do things to death. Even the best music must jar in time.

Plum of the Month.

I was amused recently to hear a new gramophone record described as the "plum of the month." The singer was a female. Not a single word of the song could be heard. If ever a woman sang with "a plum in her mouth" she did. I hope the record will be more correctly described the next time it is put on.

Have you noticed an attempt by vaudeville artistes to introduce fresh matter into their turns? Clapham and Dwyer, Norman Long, Claude Hulbert and Enid Trevor, all had new stuff to put over, which, I'm sure, was appreciated. But their manner was still the same. Whereas freshness in matter is always possible, freshness in style, it seems to me, is a different and more difficult proposition. Familiarity breeds contempt, and

if these admittedly talented people aren't able to alter their style their popularity must wane. In their own interests, I think, artistes should sometimes retire from the microphone for a while, after which they could stage a great come-back.

## TECHNICAL NOTES

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

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

That Extra H.T.

WE all know perfectly well from experience how much the working of a set is often improved by a little extra H.T. voltage, or perhaps I should say how noticeably the performance of the set falls off if the H.T. is allowed to drop even a comparatively small amount from its rated value.

The last 20 or 30 volts makes a very big difference, and although, as I say, we are very conscious of this, we may not perhaps stop to think of the reason. It is because the power output of the set increases much more rapidly than in proportion to the anode voltage.

Theoretically, in fact, the power output varies more rapidly than as the square of the anode voltage. If it varied according to the square of the voltage, then an increase of 10 per cent in the anode voltage would produce an increase in the power output of about 21 per cent.

Actually, as I say, the increase is considerably more than this. An increase of 20 per cent in the voltage will theoretically produce an increase of over 50 per cent in the power output. So you see that there is all the difference in the world between, say, 90 volts and 120 volts H.T., assuming, of course, that the higher voltage is suitable for the particular case.

"Liveliness."

I am led to these observations because a few days ago I was operating a receiver rather below the rated H.T. voltage, and couldn't seem to get any "life" into it at all. Eventually I was able to add 30 volts extra H.T., which brought it rather above the rated value, but the liveliness of the set was then most pronounced.

Of course, the above remarks are based upon theoretical considerations, and in practice the addition of an extra percentage of H.T. voltage will not, in all cases, have the same effect on the liveliness of the set; sometimes it will be much more noticeable than others, but it is always worth trying.

I should add that it is assumed in the foregoing that the grid bias is increased to correspond to the increased H.T. voltage and that the input is also raised in accordance with the new conditions. Merely increasing the H.T. voltage without increasing the input or grid bias will not, of course, give you the desired improvements.

Sharpening the Tuning.

Extra selectivity without much loss of signal strength can often be obtained by a very simple little dodge. Generally the

(Continued on next page.)

## TECHNICAL NOTES

(Continued from previous page.)

grid condenser is connected to the end of the coil closest to the anode of the H.F. valve.

But if it is disconnected from this point and connected instead to another point a little removed from that end of the coil—that is, towards the earth end—so that only a part of the tuned circuit is included between the filament and grid of the detector, the tuning is often sharpened up quite considerably. This is due to the fact that the damping effect of the detector is reduced.

If the H.F. valve is a screen grid, this sharpening up of the tuning may result in the screen-grid valve circuit being set into oscillation. If this happens you might try using a little lower voltage on the screen, or alternatively (as I mentioned in these Notes some time back) putting a little grid bias on to the screen-grid valve.

Of course, if you go too far away from the anode end of the coil—that is, too near the earth—you will begin to get appreciable reduction in signal strength, and the secret lies in finding a position for the tapping which will give you the necessary sharpening up of the tuning without serious depreciation of signal strength.

## H.F. in the Speaker.

When the loudspeaker is included in the set with a frame aerial and the two are very close together, as in a portable receiver, it often happens that the H.F. current gets into the loudspeaker, where it may cause all sorts of trouble, such as howling and instability generally. Consequently, it is a good plan in these cases to connect a small fixed condenser across the loudspeaker terminals so as to by-pass the H.F. current.

When the loudspeaker is a fair distance away from the aerial, as in an ordinary set, it is not so necessary to connect a condenser across the loudspeaker; but even in these cases you will often find it an advantage. At any rate, there is no harm in trying it if you happen to have a suitable fixed condenser handy, and you will soon see whether there is any noticeable improvement to the operation of the set.

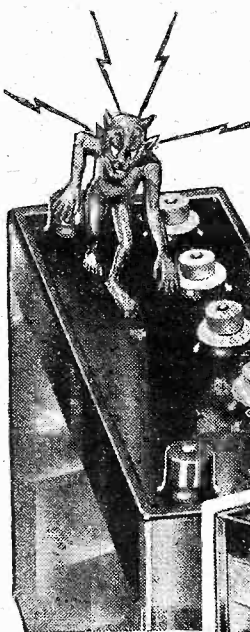
## Pentode Economy?

I have several times been asked whether the pentode valve is really economical as compared with an ordinary 3-electrode stage. There is a prevalent idea that the pentode is an expensive valve to run, more particularly in regard to anode current.

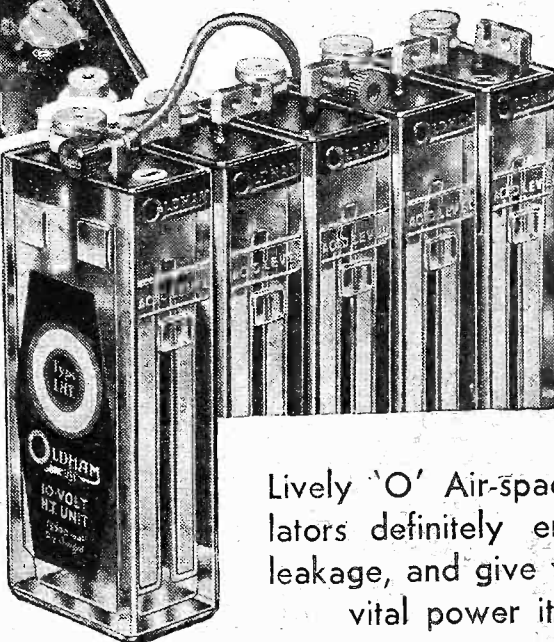
Before going into further detail the answer to this question broadly is that the pentode, the modern version, is no more expensive to run than a corresponding 3-electrode stage and, in fact, in some cases, is actually more economical. The only thing about the pentode is that it requires special output circuits to get the best results as regards quality.

Apart from that, it is particularly sensitive to a relatively small input and requires less volts to drive it than the corresponding triode. On the other hand, of course, the 3-electrode valve is cheaper in the first instance, and you can take more liberties with it in the sense that it gives perhaps better quality under ordinary conditions.

(Continued on next page.)

CELL-TO-CELL  
LEAKAGE  
ELIMINATED

Above you see how the current can creep along the smooth unbroken top of the old-type H.T. Accumulator. Compare with it the separate air-spaced cells of the Lively 'O' (right). Note also that additional means are now provided for using ordinary wander plugs for tappings.



Lively 'O' Air-spaced Accumulators definitely end electrical leakage, and give your Set the vital power it needs.

MADE IN TWO  
SIZES:

TYPE HT Standard 10-volt Unit (2,750 Milliamps)

Each **5/6**

TYPE LHT Extra Large capacity 10-volt Unit (5,500 Milliamps)

Each **6/9**

Old-fashioned smooth-top H.T. Accumulators rob your pocket and your Set. Electrical leakage can creep along their unbroken tops, causing serious waste—stealing away power for which you have paid—whether you are using them or not.

The cells of the Lively 'O' H.T. Accumulator are separated by air-gaps—thus electrical leakage is definitely eliminated. And the power stored up is available for working your Set. Therefore the Lively 'O' H.T. Accumulator needs less recharging—costs less to use, and supplies your Receiver with the smooth abundance of H.T. current that is essential for good reception. Your Dealer stocks the Lively 'O'.

The **Lively 'O'**  
MADE BY  
**OLDHAM**  
H.T. ACCUMULATOR

Oldham & Son, Ltd.,  
Denton, Manchester,  
and at London, Glas-  
gow, Belfast and  
Dublin. Makers of  
Dry Batteries and  
Accumulators. Es-  
tablished 1865. Con-  
tractors to British and  
Foreign Governments,  
Railway Companies,  
etc.



# ELECTRADIX

BUY BRITISH GOVERNMENT BARGAINS.  
ALL FIRST-CLASS GOODS.

At a time when prices are increasing we are able to offer LOWER PRICES THAN EVER.

The reason is that we have made a big purchase from the Air Ministry of the contents of an Air Force Depot.

Some of this useful apparatus is listed below, for others see special Bargain Sale List, post free.

MARCONI STATION SELECTOR or Wavetrap for cutting out interference. Fine set, 15/-.

FRAME AERIALS, in teak case, 8½ in. x 8½ in. x 2 in., fitted plug panel 9-way for short to long waves, inductance calibrated 50 to 330 mics. Sharpens tuning on any aerial, or used indoors alone, 5/-.

There are 2 huge Revolving Frame Tuned Aerials for ground station direction work. Suit college or lab., 70/-.

Vacuum Aerial Lightning Protectors. Small and neat, fix outside or in. Safe and self-setting. One should be at any receiver, 1/6 only.

R.A.F. Aero 3-VALVE RECEIVERS with remote control. All in portable cabinet, 27/6.

Naval Long-Range T.F. 3-valve Receivers, 150-2,500 metres, are a fine job. Size 9 x 9 x 6½ in., only 30/-.

A number of other Receivers cheap. Come and see. AIRCRAFT RECEIVER, R.A.F. 5-valve No. 10, with Valves, only £3.

WESTERN 7-v. Superhets, W.E., with valves, £6.

Superhet R.L. 6-v. with valves, £5 10s.

Long range guaranteed. Batts. extra. Fellows' 3-v. L.G. with valves, 35/-.

Fellows' 4-v. L.G. with valves 55/-.

All in fine cabinets. W.D. Mark III Tuners, few only, 19/6.

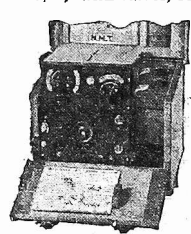
2-v. Ediswan, Marconi and T.M.C. with valves, 35/-.

3-v. G.E.C., Victor III, £3, with valves. Ediswan S.G.3., £7 10s.

AMPLIFIERS. 2-v. W.E., with valves, 22/-.

M. III 3-v., 25/-; with valves, 35/-.

D.C. Mains Amplifiers, £3 10s.



WAVE-METERS. In neat mahogany case. Cost R.A.F. £10.

For correcting your receiver, as Interference Trap or Reception strength tests. Service types N.M.T., 190 to 3,000 metres, 70/-.

Soiled Forward, Townsend, Paul & Silvertown. Offered at 25/- to clear. Heterodyne 1-valvers, Mark III, Wave-meters, 30/-.

COMPASSES. Pocket size. Neat. Just the thing for direction or frame aerials and portable

sets. Sale, 2/-.

3 in. Military Compasses, 3/-.

VALVES, LARGE TRANSMITTING. 250 watts for up to 1,500 volts. Make fine power amplifier valves for big volume. Cost £8.

Sale, 25/-.

A few need new filaments, 5/- each.

Mullard high-power valves, 55/-.

40-watt Osram trans. or power only, 4/6.

Cossor Rectifiers, 100 m/a. - Snap at 2/6.

UNUSED WECO VALVES. The famous Western Electric Midget Peanuts. Work on one volt at 1 amp. An 8/6 valve for 4/-.

POWER AMPLIFIER VALVES same make for big volume and 200 milliwatts output 6 volts 13 amps. Cut to 4/6.

TAPPING KEYS. Here we can offer you a fine selection of Morse and testing new Tappers from 6d.

R.A.F. 51 at 6/-.

Brown's, 7/6.

Combination key and 3-way switch, 7/-.

Buzzer Practice Sets, with buzzer and key on panel, standard, 8/6.

Special heavy type, 10/-.

Push keys, 6d.

BUZZERS. Tiny Townsend Wave-meter Buzzers, high note, 3/6 each.

Power Buzzers, 4/6.

Smaller type, 2/-.

CONDENSERS. 2 mfd. Sterling and T.C.C. 500 volts, 1/6 each, for smoothing. Full Guarantee. 8 mfd., 5/6; 10 mfd., 10/6.

1,500 volts ½ mfd., 4/6.

Variable 0005 mfd., enclosed type panel, 2/6.

CHOKES. Big Parmeko heavy duty, ½ amp. Chokes, 15/-.

B.T.H. Midlap, 12/6.

Radiogram, screened type, 10/-.

Icronic Chokes, 8/6.

Varley, double wound, 4/6.

ELECTRIC BELLS. G.P.O. Circular, 2/-.

Outdoor, 1/6.

Large Ironclad Bells, 6/-.

Single Stroke Signal Bells, 5/-.

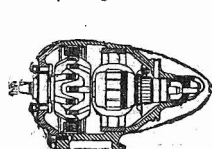
PARCEL BARGAINS. As we are dismantling much apparatus, 9 lb. Parcels of Radio Experimenters' useful Sundries, terminals, panels and fittings, holders, chokes, magnets, switches, wire, etc., etc. 7 lb. parcel for 5/-.

10 lbs., 7/-.

ARC LAMPS. 5-movement Searchlight type, 10 to 100 amps., 50/-.

A complete Movie Theatre, full-sized Film Projector by Gaumont, with motor and spools, as new. Bargain, £8 10s.

DYNAMOS. About 2 tons of all types and sizes. Given away Bargain in H.T. for 22/6.



DOUBLE OUTPUT GENERATOR. D.C. 6 to 12 volts L.T. at 5 amps. and 200-500 volts, 100 m/a. complete with H.T. smoothing unit (B.T.H. and G.E.C. Mackie). Only 22/6 to clear.

D.C. DYNAMOS. This is the star lot. 12-volt Lucas for charging 6 to 12 volts. 8 amps., ball-bearing ends.

Fitted Auto Cut-out. Cost £10. Sale, 17/6.

40 amps. 10 v., £5 10s.

4 amps. 100 v., £3.

10 amps. 100 v., £6 10s.

20 amps. 100 v., £7 10s.

30 amps. 100 v., £12.

etc. A.C. Generators, 500 cycles, Alternator, 20 amps. 10 v., £3 10s.

Double Type, 500 cycles W. 100 v. 3 amps. A.C. 70 v. 3 amps. D.C. £5 10s.

Bargain hunter: should send addressed envelope at once for new Sale List just printed. It is impossible to repeat these goods.

ELECTRADIX RADIOS,  
218, Upper Thames St., London, E.C.4  
Telephone: CITY 0191.

## TECHNICAL NOTES

(Continued from previous page.)

### Power Rating.

The pentode valve corresponds to the screen-grid valve for high-frequency amplification, and may be described as a low-frequency version of the S.G. It is much more sensitive than the ordinary 3-electrode valve in the sense that for a given output it requires a smaller input.

For instance, for an output of, say, ½ watt with an ordinary 2-volt valve in the last stage, a grid swing of 20 volts or more may be necessary, while with a pentode the grid swing will be probably less than half that amount. The pentode valve has a relatively high A.C. resistance, often as much as 40,000 to 50,000 ohms, although some recent types of pentode have an A.C. resistance not more than 20,000 ohms.

This means that the pentode tends to over-emphasise the upper audio frequencies, which gives to the reproduction a rather high-pitched quality sometimes described as "tinny." As I mentioned in these "Notes" a little time back, this effect, whether with a pentode valve or any other, can be largely overcome by means of a tone control consisting of a condenser and a fairly high resistance in series with it, the whole arrangement being connected across the loudspeaker.

In the case in question the resistance may be, say, 15,000 ohms and the condenser 0.01 microfarad. This has the effect of selectively short-circuiting the higher frequencies more than the lower ones, and so tends to counteract the over-emphasis of the higher frequencies.

### Anode Current.

As regards anode current, there is really little to choose between a modern pentode and a 3-electrode valve, in fact in some cases the latter will actually take more anode current than the pentode. Another important point is that comparatively recently pentodes have been made with a small output of about ½ watt, whereas originally the pentode output was much more than this. It follows from all this that while consuming only about the same anode current as the corresponding 3-electrode valve the pentode will give the same power with only a half or one-third of the input.

One way of expressing it is to say that it "makes better use" of the power which it draws from the battery. As I have said before, however, the pentode must always be considered in relation to suitable output circuits and proper operating conditions.

### Useful Data Wanted.

Those who are more experienced in the interpretation of valve curves will be accustomed to the type of curve showing the relationship between anode volts and anode current for different values of the grid voltage. These curves are of little use to the ordinary person, but they help us with regard to the impedance of the loudspeaker to work with the valve under the conditions in question.

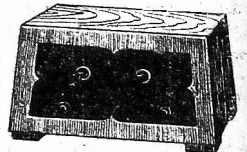
As regards the amount of undistorted output, this may be subject to a good deal of difference of opinion, which explains why the makers find it difficult to place any very precise value upon it.

(Continued on next page.)

# "MORCO" CABINETS FOR THE TELSEN TRIPLE THREE AND THE TELSEN VICTOR THREE

THE "METROPOLIS"  
CABINET No. 1102.

In medium colour Fumed Oak finish with Ebonised feet and well-designed vignette. Baseboard supplied. PRICE 10/-



Every Cabinet has a detachable back and is mounted on Rubber Feet.

CASH OR C.O.D. ORDER FORM:

To: R. MORTON & CO. LTD.

MAPPIN BUILDINGS, NORFOLK ST.,  
SHEFFIELD.

Please despatch to me.....No. 1102

for .....

for which { I enclose  
I will pay on delivery } s. d.

NAME .....

ADDRESS .....

ENGINEERS! Here is a straightforward proposition. Will you give us the chance to prove that you can earn £300, £400, £500 per year and more? It will cost you nothing to investigate, and you are bound to benefit. A postcard will bring our 200-page Hand-Book, "ENGINEERING OPPORTUNITIES," which outlines many, unusual chances of well-paid, permanent, and pensionable employment. Among other things, the book also contains details of A.M.I.Mech.E., I.E.E., B.Sc., Matric., G.P.O., etc., Exams, and outlines Home-Study Courses in all branches of Elec., Mech., Motor, Aero, Radio and Talkie Engineering, Building, etc. You owe it to yourself to read our enlightening hand-book—Free of obligation. Send for it to-day, stating branch of most interest.

BRITISH INSTITUTE OF ENGINEERING TECHNOLOGY,  
401, Shakespeare House, 29/31, Oxford Street, London

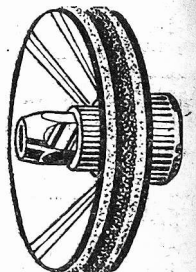
INVENTORS. Your ideas may be worth royalties if submitted to manufacturers—but apply for your PATENT first. Write for my FREE "INVENTORS' POCKETBOOK" explaining how to patent inventions. Submit particulars in confidence for free expert advice. EDWIN P. AXE, A.I.M.E., 27, Chancery Lane, London

## TONAX

is the Cone Adaptor that completely eliminates all 'chatter' and 'rattle'; vastly improves tone and volume. It grips securely the reed of any unit; makes a snug fitting with any type of cone.

Single Cone Type - 1/-  
Double Cone Type - 1/6

Three chucks, linen, felt and both deep and standard metal washers in every carton, also full instructions. Ask for 1932 model.



## TONAX

IMPROVED CONE ADAPTOR From all dealers or direct. Post 2d. extra.  
Garratt Stores (Dept. P), 193, Garratt Lane, S.W. 18

PLEASE be sure to mention "Popular Wireless" when communicating with Advertisers. Thanks!

TECHNICAL NOTES  
(Continued from previous page.)

figures or Curves ?  
It has often been suggested that instead of supplying curves with the valves which, after all, a great many users do not bother with, it would be better to supply figures. For instance, if the impedance of the loud-speaker, for getting the best results with the valve, were stated, this would be a great help; then we might also have the figure for the output (under stated conditions) to be expected with this loudspeaker. Of course, the power output required from the valve depends upon the type of speaker you intend to use and again it depends for a given speaker on how much volume you want.

Valve Improvements.  
Someone has been writing to me to say that there is really nothing new in screen-grid and pentode valves, as 4-electrode (2-grid) valves have been known for years, and it is only a small variation to add further grids.

This is perfectly true, and I do not think anybody pretends that there is anything fundamentally new in either the screen-grid or the pentode. It really solves itself into a question of design, and of making valves suitable for particular purposes.

I suppose it is true to say in wireless, as in so many other things, that there is really nothing new under the sun, everything being apparently a variation of something already known. In the old electrode valve the second grid was introduced in order to get rid of the adverse effects of the so-called "space-charge."

The screen-grid, although utilising the same electrodes, works on a somewhat different principle, and we all know what an enormous change it has brought about in the possibilities of what you might call "compact" high-frequency amplification.

The pentode has done the same thing for us on the low-frequency side, and this accounts for the fact that the majority of portable sets to-day—or even non-portable sets, for that matter, where the greatest use has to be made of the minimum number of valves—consist of three-valve circuits using screen-grid for I.F. and pentode for L.F.

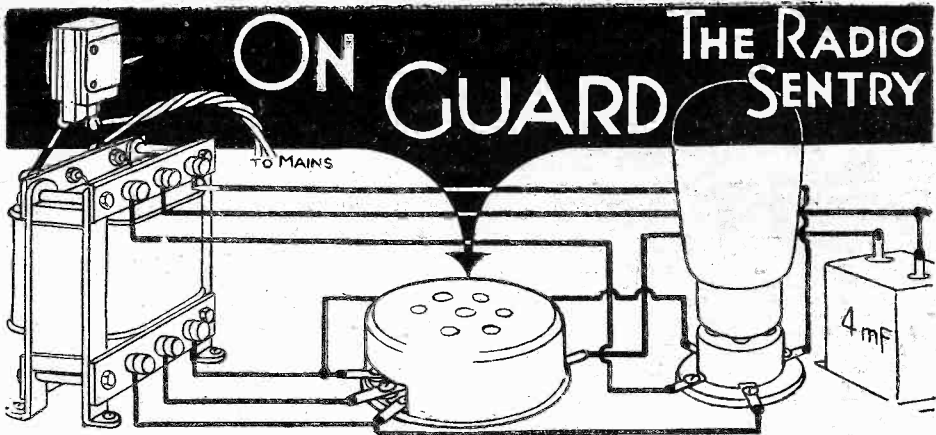
or Super-hets.

The super-heterodyne set has another type of "twin-grid" valve specially designed for cases where the first valve has to act both as oscillator and first detector. This is sometimes done for the sake of economy in valves.

As you know, the screen-grid valve may sometimes be used in this position, one of the grids of the S.G. valve being used for the oscillator and the other one for the purposes of rectification.

As it is not, however, specially designed for the purpose, it is rather stretching things to use it in this way; but the twin-grid valve, specially designed for the purpose, does the job perfectly well.

This is all the more important since there is no doubt that the super-heterodyne is rapidly coming back into popularity, and so it looks as though we have here another big opening for a still further variant of the 4-electrode principle.



**BULGIN THERMAL DELAY SWITCHES** (Patents Pending) were assured of outstanding success upon their introduction at Olympia. Thousands of technical experts immediately recognised our new contribution to "Safer Radio." If you are still switching on your H.T. and L.T. simultaneously, send at once for full details of this novel invention. It is a necessity on every mains-operated set, A.C. or D.C., and can be incorporated in ten minutes as shown above.  
Send for our 75-pp. Illustrated Catalogue and Manual. Enclose 2d. postage.



**A. F. BULGIN & CO. LTD.**, Abbey Road, Barkin, Essex.  
Telephones: Grange Wood 3266 & 3267.  
London Showrooms: 9, 10, 11, Cursitor St., Chancery Lane, E.C.4.  
Telephone: Holborn 2072

EASY TERMS

WE supply all good quality Radio Receivers, Components and Accessories on deferred terms. We carry adequate stocks and can give PROMPT DELIVERY.

- NEW CELESTION MOVING-COIL PERM MAGNET UNIT.** with Transformer. Cash Price ... £2 7 6  
Or 5/- with order and 9 monthly payments of 5/3.
- 12 EXIDE W.H. HIGH-TENSION ACCUMULATORS** (120 volts, 5,000 m.a.). Large capacity type. Cash Price ... £3 15 0  
Or 6/6 with order and 11 monthly payments of 7/-.  
Carriage charged on all orders from Scotland.
- N.K. FARRAND INDUCTOR LOUD-SPEAKER UNIT.**—Quality of reproduction almost equal to a moving-coil speaker. Cash Price ... £3 10 0  
Or 5/6 with order and 11 monthly payments of 6/6.
- SET OF 3 VALVES, S.G., Det. and Power.** Mullard or Gossor. Cash Price £1 18 0  
Or 6/- with order and 7 monthly payments of 5/4.
- NEW BLUE SPOT 6ER UNIT.** The finest balanced armature movement on the market, complete with large Cone and Chassis. Cash Price ... £2 10 0  
Or 5/- with order and 10 monthly payments of 5/-.
- NEW HEAYBERD A.C. ELIMINATOR KIT C-150.** Complete kit of parts for building an H.T. Eliminator, including steel case. Output 25 m.a., 150 volts. 3 H.T. tappings, one variable. Cash Price ... £3 16 0  
Or 6/6 with order and 11 monthly payments of 7/-.

Send list of requirements, and quotations will be sent by return. Price List FREE on request.

**LONDON RADIO SUPPLY CO.**  
11, OAT LANE,  
NOBLE STREET, LONDON, E.C.2  
TELEPHONE: National 1977.

It pays you to ask your Retailer for genuine guaranteed

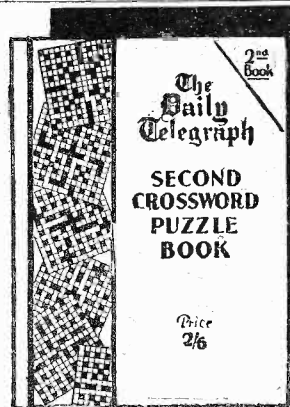
**WAVEMASTER**

Variable Condensers and Extensers for all the latest circuits

WEBB CONDENSER CO. LTD.,  
42, Hatton Garden, London, E.C.1.

ALL

APPLICATIONS for Advertising Space in "POPULAR WIRELESS" must be made to the Sole Advertising Agents, JOHN H. LEE, LTD., 4, LUDGATE CIRCUS, LONDON, E.C.4



**For Crossword Enthusiasts**  
50 Puzzles are reproduced in the Daily Telegraph Crossword Puzzle Book. Neither too hard nor too easy, they possess that leavening of wit and humour that has brought a world-wide reputation to the Daily Telegraph Crossword.

At all Newsagents - - 2/6  
or they can be sent to any address for 2/10 each (post paid), by the Publisher of the

**Daily Telegraph**  
FLEET STREET, LONDON, E.C.4.

WET H.T. BATTERIES

Solve all H.T. Troubles.  
SELF-CHARGING, SILENT, ECONOMICAL  
JARS (waxed), 2 1/2" x 1 1/2" sq. 1/3 doz.  
ZINCOS, new type 10d. doz. Sacs 1/2 doz.  
Sample doz. (18 volts), complete with bands and electrolyte, 4/1. post 9d.  
Sample unit, 6d. illus. booklet free.  
Bargain list free.  
AMPLIFIERS, 30/-, 3-valve set, £5.  
P. TAYLOR, 57, Studley Road, STOCKWELL, LONDON

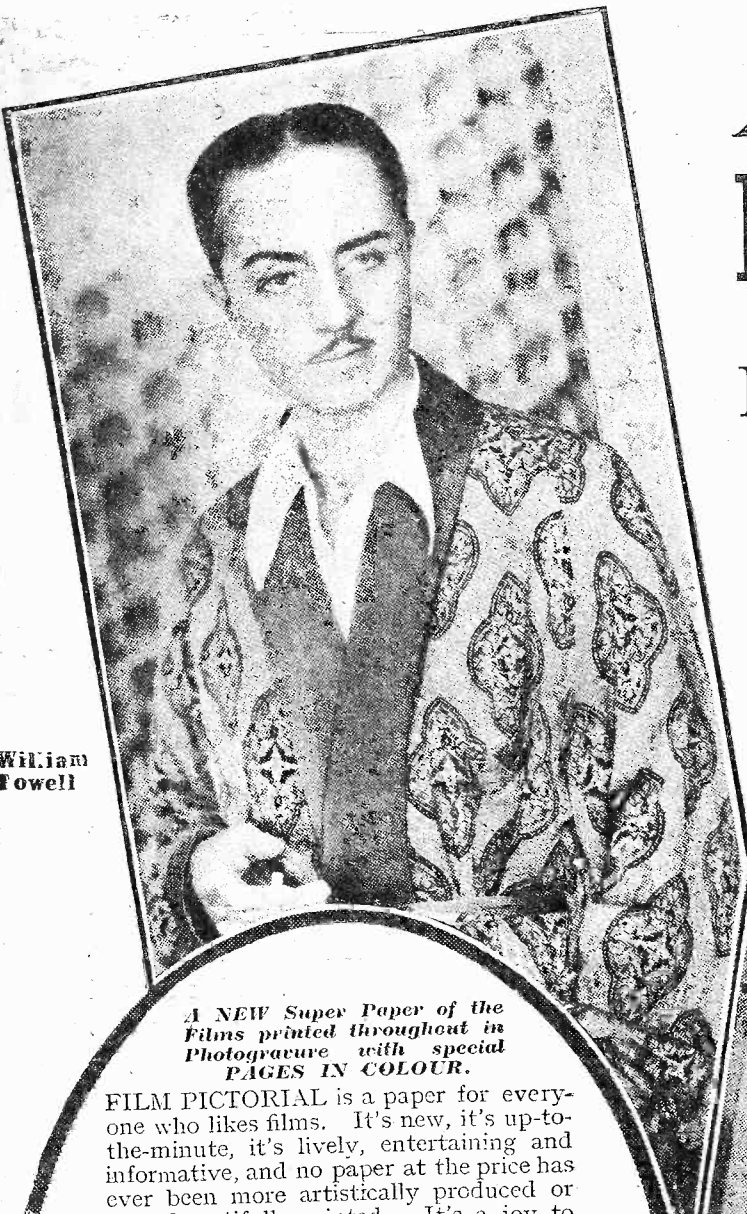






Both These Lovely  
**ART PANELS**  
**FREE** To-day  
with No. 2 of  
**FILM PICTORIAL**

*The New Super Paper of the Films*



William Powell



Joan Crawford

*A NEW Super Paper of the  
Films printed throughout in  
Photogravure with special  
PAGES IN COLOUR.*

FILM PICTORIAL is a paper for everyone who likes films. It's new, it's up-to-the-minute, it's lively, entertaining and informative, and no paper at the price has ever been more artistically produced or more beautifully printed. It's a joy to the eye and a joy to read. Here are a few of the special features in No. 2—not to mention the wonderful double gift.

**"SCREEN HITS"**

**£2000** First Prize

**EDGAR WALLACE**

Another gripping instalment of the famous author's Hollywood Diary

**Why Did Adolphe Menjou Leave Hollywood**

Adolphe, in an exclusive article, replies to the rumour-makers and reveals the truth about himself.

**SEYMOUR HICKS**

"Studios frighten me" declares the inimitable Seymour, actor and writer as well.

# Film Pictorial

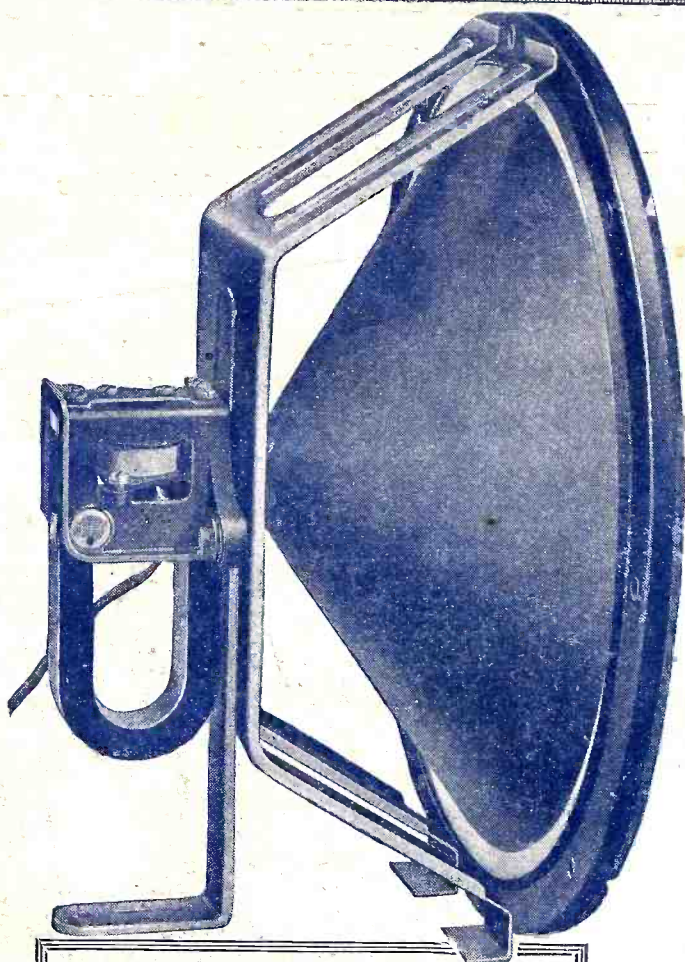
*Buy your copy to-day—with TWO FREE GIFTS 2d.*



# AMAZING is the only word!

## BLUE SPOT

# 1000



**S**UPERLATIVES are the only possible adjectives in describing this wonderful BLUE SPOT Loudspeaker Unit.

Nothing like it has ever been heard before. It is the nearest to natural that science has ever produced. Speech, music and song are made living realities, full of colour and personality—the *real* thing at last.

This amazing inductor type speaker is as good as the most expensive dynamic speakers and costs but a fraction of their price.

Price complete mounted to chassis

# 39/6

It is the best of all speakers for use with any of the popular Kit Sets. Hear one and you will have nothing else.

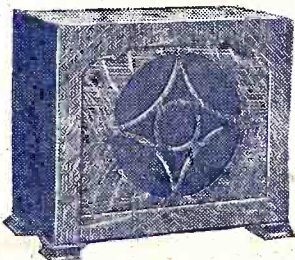
Ask for Catalogue No. P.W. 29U

**BRITISH MADE THROUGHOUT**

### IF YOU WANT A CABINET SPEAKER

with the famous 1000 unit, the model illustrated in a handsome cabinet of solid oak is just what you need.

Ask for Catalogue No. P.W. 29S.



Price complete

# 63/-



TRADE MARK

## THE BRITISH BLUE SPOT COMPANY LTD

BLUE SPOT HOUSE • 94/96 ROSOMAN STREET • ROSEBERY AVENUE • LONDON • E C 1

Telephone: Clerkenwell 3570.

Distributors for Northern England, Scotland and North Wales:—H. C. RAWSON (Sheffield and London), LTD., 100 London Road, Sheffield; 22 St. Mary's Parsonage, Manchester; 183 George Street, Glasgow.

Grams: "Bluespot, Isling, London."

Hutcheonad