

BIG RADIO EXHIBITION NUMBER

Amateur Wireless

and
Radiovision

3^D

**FULL DETAILS of the FIRST
CRUSADERS' SET—**

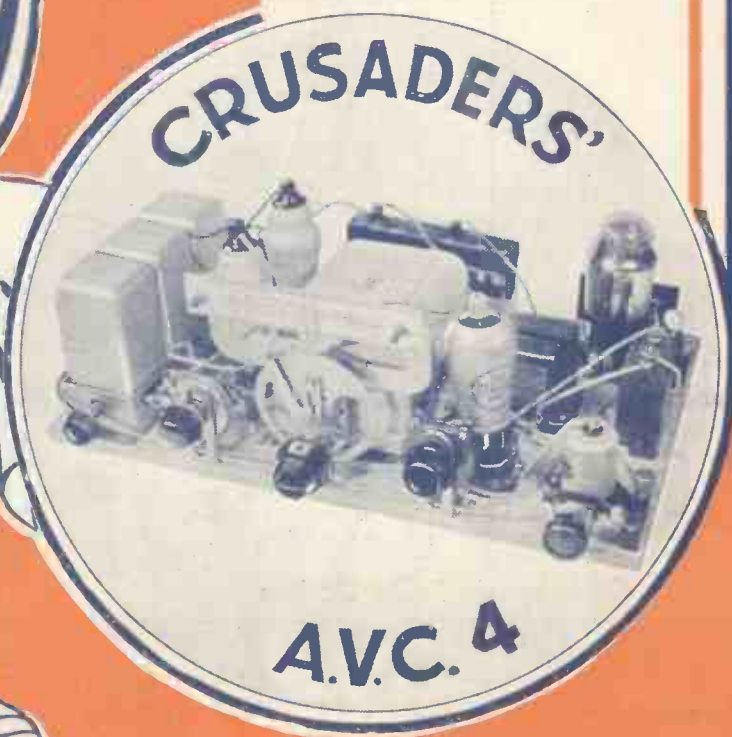
*An A.V.C. Four That Does
the Work of a Seven!*

*Every
Wednesday*

Also in This Issue

- *Your Guide to Radiolympia*
- *All About the New Components*
- *Finding Your Way with a Meter*
- *All About the New Sets*
- *Radio Takes the Helm!*
- *B.B.C. Shows at Olympia*

Scores of Illustrations



RADIOLYMPIA

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The battery that
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G.E.C.H.T.

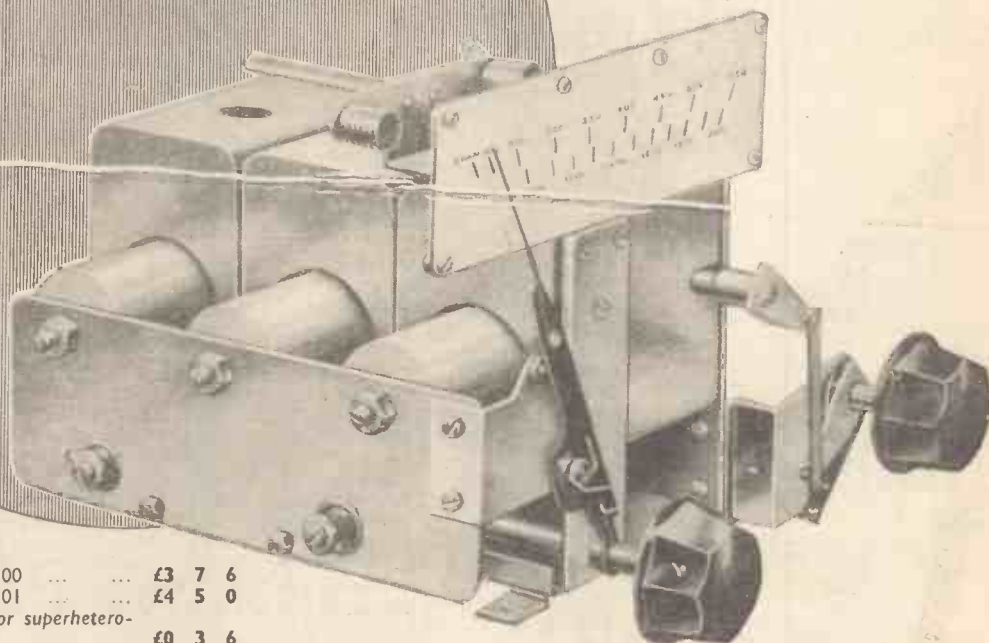
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A TRIAL MEANS YOU'LL ALWAYS USE G.E.C.H.T.

Advt. of The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2

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PERMEABILITY TUNER



Permeability Tuner (3-gang), BP 100	£3 7 6
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Both selectivity and quality remain constant over the whole of both wavebands. ● The inductance of the coil is varied by sliding a powdered iron core into and around the coil ● It is the perfect tuning unit; making possible the design of a receiver giving good quality at all wavelengths—quality obtainable being limited only by station separation and reception conditions ● Both 3- and 4-gang units available. "3-gangs" can be used as a band-pass filter followed by single Intervalve circuit, or as three single tuned circuits. "4-gangs" can be used as TWO band-pass filters or as band-pass filter and two single tuned circuits ● Perfect tracking of aerial circuit ● Initial matching of circuits is maintained.

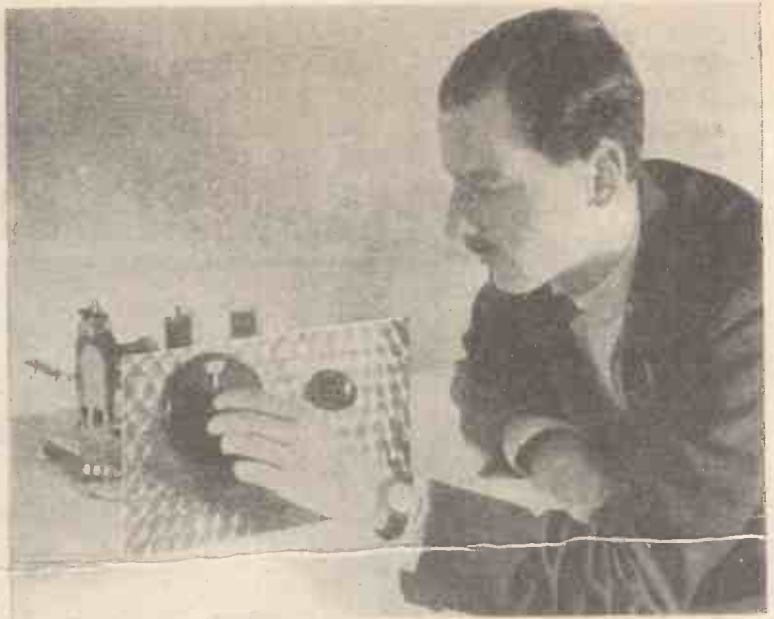
PROPRIETORS:- OLIVER PELL CONTROL LTD.

FOREMOST AS PIONEERS

Advertisement of Varley (Oliver Pell Control Ltd.), Bloomfield Road, Woolwich, S.E.18.

Telephone: Woolwich 2345

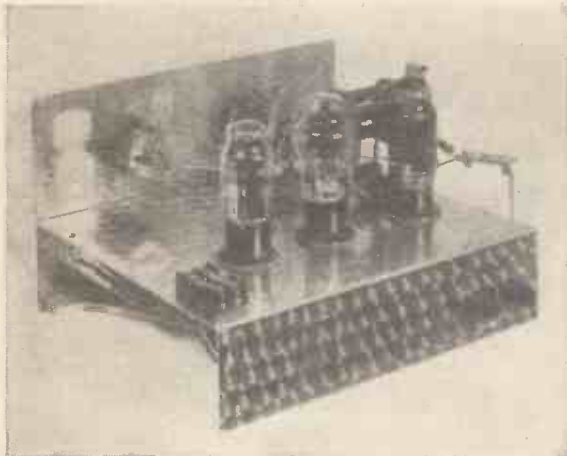
A SHORT-WAVER for A.C. or D.C. MAINS —introducing a new and simplified method of S/W tuning



One of the troubles of short-wave reception has been the difficulty in logging stations particularly where three or more are within one degree of each other on a 180-degree dial.

In the August "Wireless Magazine" are published details of the "W.M." Band-spread Short-waver. This is an efficient short-wave two-valver using the new A.C./D.C. valves. The design incorporates band-spread tuning, which makes short-wave work as easy as that of ordinary broadcast sets. "Band-spread" tuning means that after the main tuning condenser has been adjusted so that it brings in the middle of, say the 25 metre band, the midjet band-spread condenser is then used and the two degrees that represent the 24- to 26-metre band are spread over 180 degrees so that reception of these stations is ridiculously simple.

Get a copy of the August issue, now on sale, price 1/-, and read the full constructional details of the short-waver which will at last enable even the merest novice to obtain a healthy bag of short-wave stations.



CLEAN AND NEAT LAYOUT
A back view of this new short-waver showing its clean and simple lines



WIRING TO THE COIL
An interesting photo showing the wiring to the coil and high-frequency pentode detector

OTHER CONTENTS OF THE AUGUST ISSUE INCLUDE:

FOR THE CONSTRUCTOR

THE TYERS PORTABLE. Designed by Paul D. Tyers.

TECHNICAL FEATURES

WHAT NEW IDEAS SHALL WE SEE THIS SEASON? By the "W.M." Technical Staff.

MAKING AND USING A UNIVERSAL TESTER. By Marcus G. Scroggie, B.Sc., A.M.I.E.E.

HOW TO TRACE AND CURE HUM. By S. Rutherford Wilkins.

OUR TESTS OF THE NEW SETS.

TESTS OF NEW APPARATUS.

USING THE NEW VALVES. By the "W.M." Technical Staff.

GENERAL ARTICLES

GUIDE TO THE WORLD'S BROADCASTERS. By Jay Coote.

WORLD'S BROADCAST WAVELENGTHS

VALVES IN THE MAKING

I.B.U.—THE RADIO LEAGUE OF NATIONS. By Alan Hunter.

SHOULD AMATEUR TRANSMITTING BE ENCOURAGED? By Kenneth Jowers.

AUTOMATIC S O S FOR THE YACHTSMAN. By Malcolm Harvey.

A WARNING TO THE B.B.C. By Whitaker-Wilson.

MY EXPERIENCES WITH CAR RADIO. By Percy W. Harris, M.Inst.Rad.E.

FORTY SEASONS OF "PRÔM" CONCERTS. By Whitaker-Wilson.

AMERICA'S NEW 500-KILOWATT GIANT. By Lionel Merdler.

WIRELESS JOBS MADE EASY FOR MR. EVERYMAN. By R. W. Hallows, M.A.

NEW EGYPTIAN BROADCASTING STUDIOS.

RECORDING—AND HOW YOU CAN DO IT AT HOME. By Frank Charnley.

ON THE CREST OF THE WAVES. By Jay Coote.

THE "W.M." EMPIRE SHORT-WAVER IN FIJI.

CHOOSING YOUR RECORDS. By Whitaker-Wilson.

TELEVISION SECTION

THE CONSTRUCTION OF TELEVISION RECEIVERS. By H. Corbishley.

WIRELESS MAGAZINE

AUGUST ISSUE—NOW ON SALE—PRICE 1/-

**THE FOCUS
OF ATTENTION
AT
RADIOLYMPIA**

**G.E.C.
RADIO**



MADE IN ENGLAND
Sold by all Radio Dealers.

The General Electric Co. Ltd. ("G.E.C.")—the largest British electrical manufacturing organisation in the Empire—has produced a magnificent range of receivers to meet every demand. The G.E.C. "A.C./D.C. Mains 3," typical of the new sets, is the finest radio value offered to-day. Insist upon your dealer demonstrating its remarkable performance and quality of reproduction.

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BC3521—25 cycle model
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**SEE THE COMPLETE NEW
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G.E.C. THE SETS WITH THE BIG NAME BEHIND THEM

Advt. of The General Electric Co. Ltd., Head Office and Public Showrooms : Magnet House, Kingsway, London, W.C.2.

Please Mention "A.W." When Corresponding with Advertisers.



For nearly forty years "His Master's Voice" have kept ahead by continual development in the science of sound reproduction. When radio came into being, the radio instruments made by "His Master's Voice" immediately took their place in the top rank—not merely because of the research that lay behind them and the brilliance of their design, but because of the unrivalled methods used in their manufacture. The new "His Master's Voice" models, now on exhibition at Olympia, provide what is probably the most sensational proof of the supremacy of "His Master's

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SEE THE NEW "HIS MASTER'S VOICE" MODELS AT OLYMPIA

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THE
RADIO
EXHIBITION
OLYMPIA
August 16-25

"His Master's Voice"

The Gramophone Company, Limited, 98-108 Clerkenwell Road, London, E.C.1. (Prices do not apply in I.F.S.)

Mention of "Amateur Wireless" to Advertisers will Ensure Prompt Attention

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News and Gossip of the Week

Radiolympia Is Here!

OUR real Show Number—and we hope you like it! Plenty of articles to guide you in your choice of new sets and components. Another bumper number next week, don't forget!

Our Welcome

WHEN you do come to Radiolympia—of course you ARE coming!—we shall expect you to give us a look-up. Our men are all prepared to sort out your radio problems.

Constructor Crusaders will be very certain of a warm welcome, of course.

That 24-hour Clock

SO it is to go on Sunday, August 19, presumably never to return? The B.B.C. has decided the experiment has been unsuccessful, and that is all about it. Nice to be able to dismiss your errors of judgment with such ease.

Who Started It?

ONE of the earth's secrets, probably, but one of those little sparrows that hop round the steps of Broadcasting House dropped a hint on the pavement. It whispered P.M.G. Well, you never can tell.

B.B.C. Dance Band

THE B.B.C. Dance Orchestra directed by one Henry Hall, has been ordered a rest for its health. It is to be sent away after the Exhibition for a fortnight. Its signature tune will be stowed away in the safes of Broadcasting House.

Its Deputies

FOR the first week we are to have the services of Maurice Winnick and, although it is still summertime, Marius Winter will also be heard. The next week we return to summer time once more. We are to have Debroy Somers. Let us hope the weather keeps fine for both.

Radio Shows

IN full swing, of course. Everything going wonderfully. On August 20 and 22 we shall get a pick of such artists as Arthur Prince and Jim, Anona Winn, Clapham and Dwyer, the Carlyle Cousins, Bertha Willmott, Stainless Stephen, Alec McGill and Gwen Vaughan, and many others. You may look forward to a strong cast.

Kitty Masters and Les Allen

doing their stuff with Henry Hall; of course.

Programme Changes

WITH the opening of Droitwich there will be one or two changes in the methods of transmitting the programmes.

The Children's Hour, for example, will only be given on the Regionals.

Droitwich will be confined to broader issues—such as the dance programme usually relayed at that period of the day.

On Long Waves

TO hear Henry Hall at 5.15, listeners will tune-in the long waves. For a time, however, the Little Nationals (London, West, and North) will continue to operate after Droitwich has taken over full service.

During this period the dance music will be available on medium and long wavelengths.

Theatre Performances

YOU understand there will be three variety performances daily at the Exhibition theatre and the entire bill will be changed three times during the run, each bill running for three consecutive days?

Excerpts from performances will be broadcast nationally on August 16, 20 and 25 and regionally on the 18th and 22nd.

The Dancers

IN order to obtain the best troupe of dancers, both Eric Maschwitz and John Sharman spent several weeks studying various troupes all over the country.

They finally chose a company of dancers who will be billed as Rosalind Wade and her Radiolympia Girls.

'Opping 'Ooliday

A RADIO show of that name by Laurence Gilliam and Pat Forrest will be given on September 15. Quite novel.

The first will be a sound record of the hop pickers leaving London by the Hop-pickers Special, and later in the play there will be an actual relay from a hop farm concluding with a sing-song from a "pub" in Kent.

The Proms.

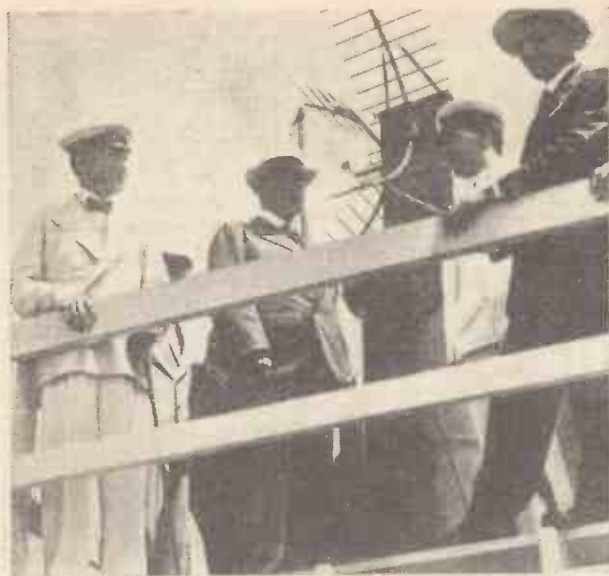
THE Proms. are going on swimmingly. May and Beatrice Harrison appear in the Delius concert on the 23rd.



Constructor Crusaders! Meet your first set! The A.V.C.4 being given the once over by a member of our Technical Staff before it passed on to the draughtsmen—who have made a blueprint you—as a Crusader—are entitled to FREE on application. Note the specially designed cabinet by Peto-Scott; a loud-speaker cabinet to match is also available

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Marconi photo

Blind steering is now possible with this new Marconi micro-wave beacon-signalling apparatus—recently installed for a demonstration at Sestri Levante, near Genoa. Another triumph for the Marchese Marconi—who is, of course, the greatest radio Crusader of all!

BECAUSE you are a Crusader—or aren't you?—the blueprint for the Crusaders' A.V.C.4—normally costing you 1s. 6d.—is sent FREE to you automatically—without any special request on your part.

Just think a minute. Normally that blueprint would cost you, as we say, 1s. 6d. Moreover, in due course, as the Crusade progresses throughout the season, you will receive three other free blueprints, worth either 1s. or 1s. 6d.—according to the number of valves in forthcoming star sets.

Low Cost of Crusading!

Yet the total cost to you to become a Crusader and thus to make yourself eligible for this free blueprint service is only one shilling!

This small charge is made not to defray anything of the cost of the blueprints—which,

the hobby among their friends, and to co-operate with us in the design and production of AMATEUR WIRELESS receivers.

Now, if you are a keen set-builder, you would in any case want one or two—even the whole lot of the blueprints of the star sets we produce during the coming season. So that just from that mundane point of view membership of the Crusaders is valuable to you — is a means of saving hard cash.

We want you to benefit in this way. It is part of our proof of a desire to render you service. We want to place in your hands the blueprint of the A.V.C.4—first Crusaders' set—so that you can build away confident in the knowledge that this full-size layout and wiring diagram will ensure success in your efforts.

Moreover, we similarly want you to have the next three blueprints, one in October of this year, and two in the early part of 1935.

Free Blueprints for Crusaders!

Our Unique Service to all Keen Constructors

believe us, are expensive productions—but to cover mere postage and office expenses in writing to you whenever you are in trouble about your Crusader sets.

So that, while you virtually become a Crusader free of charge, you immediately gain financially.

It is obvious that if you become a Crusader it is because you are keen on home construction. That is, after all, the backbone of the Crusade—and members join simply to foster the love of radio set-building, to spread

With these blueprints as a nucleus you can start work on the construction of our sets. And, in the long run, that is the big job on hand—to build up these sets and so help to evolve an ever higher standard of technique among amateur radio enthusiasts.

All the Qualification Needed

Your earnest desire to participate in this important work is all the real qualification needed to join up. Below we reprint for the benefit of new readers the enrolment form, which we want every keen constructor who has not already done so to fill up and send to us for examination.

In due course we will mail you a certificate of membership. This will be numbered—and henceforth you will be known to us as CC No. so-and-so—in all your technical correspondence you will be required to quote your number to facilitate the work at this end.

Fight for Better Radio

The badge, which many readers have already written to say they think is most attractive, symbolises the fight for better radio. It is a neat design, unobtrusive yet uniquely interesting.

You can get this buttonhole badge—when you enrol for membership—price 1s.

We should like to remind you that, quite apart from the "freedom of the blueprint club," you gain materially in another potent way. You gain in the free use of our technical advice bureau—in all questions relating to Crusader sets you may build.

Is it any wonder that amateurs are simply streaming in with their enrolments?

THE PRIVILEGES OF MEMBERSHIP

- 1.—Every Constructor Crusader will receive a full-size blueprint immediately on publication, of each of the four star sets to be described in "Amateur Wireless" during the 1934-35 season. These sets will be released on August 15, October 3 (1934), and January 23 and March 13 (1935).
- 2.—Every member will also be entitled to free technical advice in connection with any or all of the four special Crusader sets mentioned above (each query must be accompanied by a stamped and addressed envelope for the reply). In the case of queries regarding any other "Amateur Wireless" sets the usual rules of the Information Bureau must be observed.
- 3.—All Constructor Crusaders are invited to contribute ideas and suggestions to the Constructor Crusaders' Corner. Constructive suggestions will be specially helpful and will be interpreted by the "Amateur Wireless" Technical Staff as far as possible to the advantage of all set builders.
- 4.—Immediately his application for membership has been approved every Constructor Crusader will receive a certificate of membership. Note that the membership number must be quoted in all future correspondence.
- 5.—Constructor Crusaders will be authorised to wear the badge of membership. Badges for buttonhole wear can be obtained for 1s. extra each, post paid.

To Constructor Crusaders, "Amateur Wireless,"
58-61 Fetter Lane, London, E.C.4.

(Enclose in envelope bearing 1½d. stamp.)

Please enrol me as a member of the Constructor Crusaders. I enclose postal order for 1s. to cover postage on four free blueprints and office expenses (and also an extra 1s. for buttonhole badge).* It is understood that I shall be entitled to free technical advice on any matters concerning the four free blueprint sets. My name and address are:

August 18, 1934

Value of Postal Order Enclosed	For office use only.			
	No.	C	B	L
.....				
*Delete if not required				

Something New in Portables

It Weighs Less Than 3 lb.!

PORTABLES have been in the nature of a "white man's burden," haven't they? At least, burdensome whenever such sets were called upon to be just, well, portable.

For the plain truth is that portable wireless never has been able to live up to its promise—it never has been truly portable.

Transportable—yes. But then, so is an elephant.

Small wonder that a gullible public gradually ceased to be gulled; that the voice of the people cried out aloud against back-breaking hundred-weights of wireless apparatus masquerading as something portable.

true portable has vanished. Listeners of a roving disposition still dream of vest-pocket radios. That dream is brought materially nearer by a set I shall now introduce to you—a seven-ounce radio set that will be on show at Radiolympia.

Not perhaps a vest-pocket radio—but certainly approaching it more nearly than anything else since radio began. An overcoat-pocket radio, in fact.

It has an interesting history, this really portable set. Began four or five years ago, when a certain Mr. C. L. P.

Dean, electrical engineer, became engrossed in the fascinating problem of designing a set that policemen could carry about with them.

Brighton—that Queen of watering places on the south coast—became the *mis en scene*. Roberts began furtively to a carry round contraptions that picked up signals from the Brighton police headquarters. But that was long ago. All the world knows now how dozens of Brighton's policemen carry with them complete sets and calling devices, keeping them in constant touch with the transmitter at "H.Q."

If sets could be designed and operated successfully by policemen—why not put the idea into practice for ordinary listeners? That was the brain-wave Mr. Dean was inspired to follow up.

The result is a knock-out; in fact, the first real portable I have ever seen, handled, tested, and listened-in with. Let me give you a few facts to clothe the fancy pictures of the set you can see on this page.

First, the weight. The little set itself weighs just seven ounces—and that leaves the tiny two-volt accumulator, the bunch of cells making up the small high-tension battery—and the pair of headphones. Think of it—seven ounces



"A.W." photo

Listening in on the smallest portable—and the lightest—in the world. There is room in the case for the headphones the listener is wearing

for a wireless set! The frailest specimen of humanity could carry half a pound's worth of radio about without undue physical strain—don't you agree?

Like a Box Camera

Now the size. Almost like a box camera. The black case measures 5½ in. by 3½ in. by 4½ in. deep. There is a small handle as with a camera. Certainly the smallest thing in radio sets ever produced.

Inside this case are ingeniously fitted the set, the batteries and the headphones—making the total weight still well under three pounds.

As the basis of this Lilliputian set there are two midget valves—of the type recently introduced in the Marconi and Osram groups. The filaments of these valves take only .1 ampere at 1 volt, so that the two of them in series are still mighty economical—taking .1 ampere as for one valve alone.

Then the high-tension current is equally tiny. Just one milliampere for the two valves, which are used in a super-regenerative type of circuit specially developed by Mr. Dean for police-radio working.

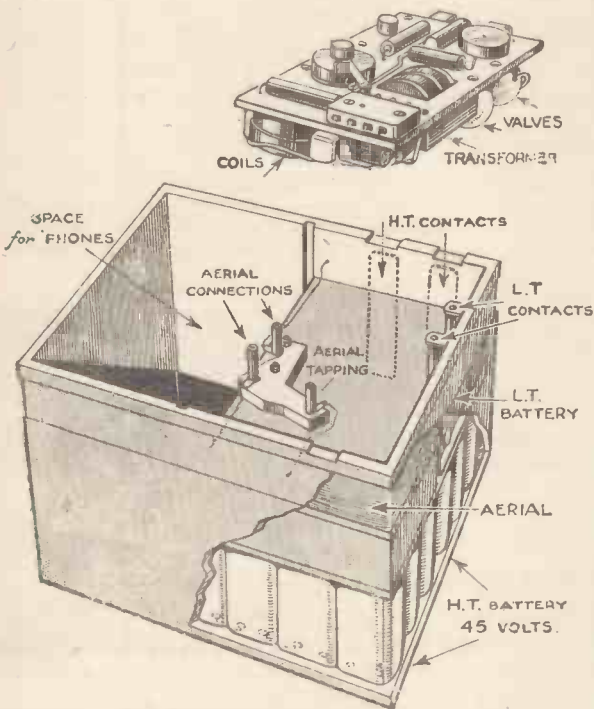
Negligible Current Drain

Even with the tiniest police-cell type accumulator of 3 amperes actual capacity, then, the set will give 30 hour's service between charges. As for the high-tension battery—that has practically its "shelf" life of nine months or a year, the current drain being almost negligible.

As our photographer has graphically shown, the set itself can be held in the palm of the hand quite easily. You see from this picture the two midget valves stripped of their quite unnecessarily large bases, mounted side by side at one end of the set, with a tiny low-frequency transformer, quencher coils and other small parts neatly fitted into the rest of the available space.

Another picture shows how the set compares in size with a box of matches—the accumulator on the left is pretty neat, too.

Note, also, the look of rapt attention on the face of the member of the Technical Staff listening

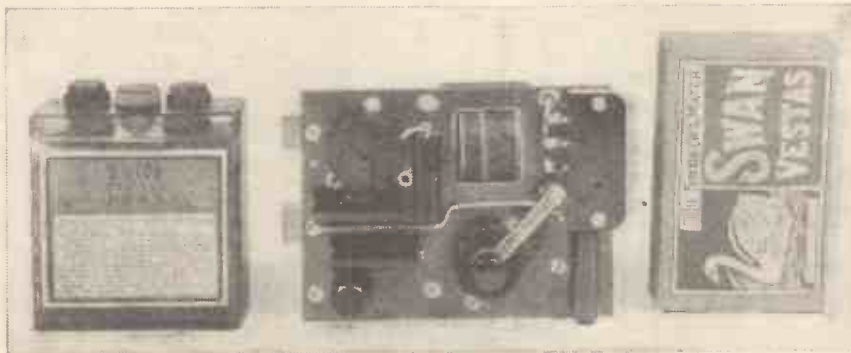


The whole works exposed by our artist! You can clearly see the aerial winding round the framework, the position of the batteries, and the way they are connected up. A complete radio installation in a case the size of a camera!

So that to-day the simplest of Simons knows a portable is not portable.

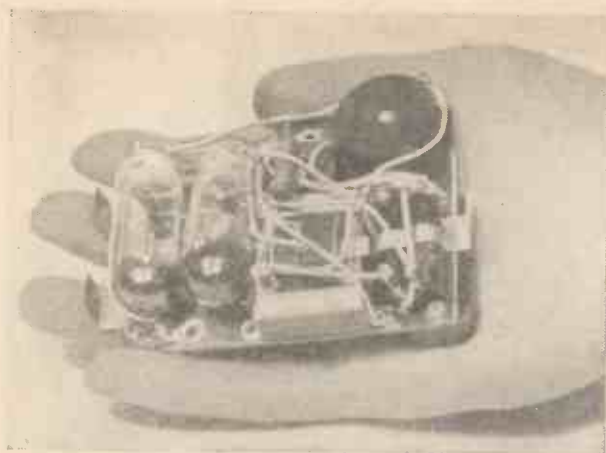
One or two notable self-contained sets certainly exist—and will continue to do so. Because one of the great attractions of all portables—irrespective of the weight problem—is complete self-containedness. Sets working from frame aerials inside the cabinet, with either a battery or mains-power supply, are self-contained radio installations. As such, they have a useful function.

But that does not mean the ultimate need for a



"A.W." photo

Up against a matchbox you can see just how small is the portable. On the left is the police-type cell that fits inside the case for the low-tension supply



"A.W." photo. This portable really does take the palm! See the midget valves on the left—and the tiny low-frequency transformer to the right?

on the set while the photographer was busy getting a "quick one" of the set all fixed up in the case.

He really *was* listening, believe me. For what you see in that picture is the whole "works." The case contains, in addition to the apparatus I have mentioned, a frame aerial of diminutive size. Yet because it is a super-regenerative type of set—a sort of super-reaction set probably unknown to the majority of moderately new readers, I imagine—the frame is big enough.

Certainly I heard very strong signals from the London Regional when I donned the headphones at the AMATEUR WIRELESS offices—notoriously poor for reception, anyway.

Incidentally, the frame was practically

non-directional. And so it is for most reception of all near-by stations. The range is quite amazing—the inventor guarantees 100 miles from a regional. Mr. Dean tells me he can pick up plenty of foreigners at night, too. Judging by the strength of the home station I should say he was modestly estimating night-time capabilities.

All the wavelengths wanted by the average fan are encompassed by this Tom Thumb set—it tunes as it stands from 200 to 600 metres. The tuning is done very easily on a pre-set type control knob. Reaction is also simple. There is no high-pitched whistle.

There is the point about headphones. Will listeners stand for them? They will have to if they want a real portable. Personally, I think there are many occasions when phones are infinitely preferable to a loud-speaker—as when listening, for instance, to late dance music in bed.

For travellers in this green and pleasant land a headphone portable, used for short spells of listening to news and so on, ought to be decidedly attractive.

Anyway, the whole thing is so neat and effective in action that it ought to sell itself if only as an auxiliary. At the proposed price of 4 guineas complete, too, it comes within the range of a large number of intending set-buyers.

The Portabout, as this little set is called, can be seen on Stand 23 at Radiolympia. It is made by British Portabout Products, of 2 Gray's Inn Road, W.C. Don't miss it! A. H.

THAT MYSTERY STATION

IN connection with the letter from F. Bahr, of Liverpool, concerning the mystery station GTM, he will probably be interested to know that this is the station operated at the Liverpool police headquarters. GTM1 and GTM2 are the police cars, and No. 2 referred to in the transmission would, of course, be GTM2.

Mr. Bahr states that he heard the station near where Poste Parisien comes in. GTM operates somewhere in the region of 145 metres, and I often hear the transmissions when working on the 160-metre amateur band.

What your correspondent heard would probably be an overtone, which would come in at fairly good strength as he lives in Liverpool and is quite near to the transmitter.

ALLAN OGDEN.
Old Colwyn, N. Wales. (Radio G—2BKH). [1135]

TROUBLE FROM THE POLICE!

IN reply to F. Bahr's letter, GTM has caused me to decide on selling my set.

His transmission drowns anything I happen to be listening to—at all hours.

As far as I can gather this call sign belongs to Old Swan Police Station, and is used to keep police patrol cars and cycles in touch with headquarters. No. 2 is probably one of these.

Frequently GTM reverts to signalling in morse, which upsets my reception even worse, the pitch being similar to the B.B.C.'s tuning note but much louder.

H. T. HARRISON.
Liverpool 15. [1136]

"GTM"

WITH reference to Mr. Bahr's letter in your issue of August 4 as to reception of a station signing as above.

This station is owned and operated by the Liverpool City Police, and is situated at Derby Lane, Old Swan, Liverpool. The test call referred to was being made to a police car before it proceeded on patrol duty. The operating frequency of the station is 2,040 kilocycles, and the input power 100 watts. G6OM.

Heswall. [1137]

ON THE LONG WAVES

WITH reference to the letter under "Mystery Station," from F. Bahr, Liverpool, I have heard the call sign GTM on a number of different occasions, but on the long waveband quite close to Daventry National.

To-day at 1830 he gave his call as GTM. No. 1 and gave a talk for quite 10 minutes on the progress of wireless, etc., and finished up with "GTM testing to No. 1 over."

Have also heard him as No. 2 with same letters.

G. W. CLARKE.
Liverpool, 15. [1138]

ARE SHORT WAVES RELIABLE?

AS a keen short-wave fan, I recently had to defend my favourite waveband—from 100 metres downwards, that is—against fierce attacks from a group of ordinary broadcast listeners.

These "B.C.L.'s" denied that there was any pleasure in short-wave listening—and suggested that S.W. fans had rather too elastic imaginations!

Well, for many weeks I have listened regularly every Sunday morning at 5 a.m. to Joe Stokes from the Pittsburgh short-wave station W8XK, on 48 metres.

I have heard all the detailed schedules read out by the KDKA DX Club in this half-hour's programme—and have followed up the information so received. No imagination about that!

H. HAYWARDS.
Sussex. [1139]

Listeners' Letters

COIL PROTECTION

To the Editor, AMATEUR WIRELESS

IN view of the recent appearance of your Short-wave World-beater, users of the specified coils (or of the similar four-pin type) may be interested in a convenient way of keeping them from damage when not in use.

Procure some small tins of suitable size, each of which should be painted a different colour for identification. The tins may then be screwed to wood bases in sets—say three tins to cover 12-90 metres, and another "gang" of three to cover 70-500 approximately.

Small knobs may be fitted to the lids, and if cardboard rings are made to fit inside the tin round the "legs" of the coil (which should be upside down) this will prevent rattling when moving them about. For the World-beater, of course, double sets of six each would be required.

C. A. C. CLARKE.
Delabole, Cornwall. [1133]

PROGRAMME BOARD

THERMION'S programme protest in the issue dated July 21 introduces a subject which should be dealt with at once by all listeners.

The programme arrangement of the B.B.C. between 6.30 p.m. and 8 p.m. as it exists at the present time savours of subterfuge.

When one considers the number of Regional and National transmitters that are available and the number of entertainers, such as musicians and vocalists, that are available, it should be possible to provide alternative programmes to satisfy the tastes of all listeners.

When one considers the sum of money the

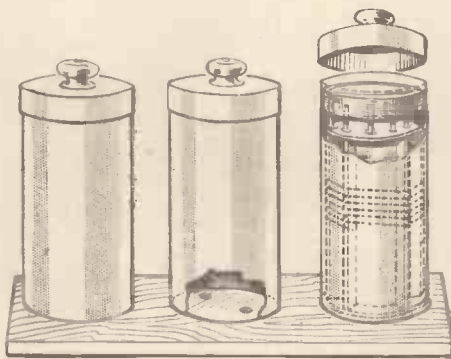
B.B.C. obtains from the licence fees, it should not be a question of cost. The alternative programme business has never, to my mind, been carried out to the letter.

I have always been of the opinion that the listener should have direct representation on the Board of the B.B.C. This could be brought about by zones or districts nominating a representative who could be placed in a position to know the requirements of his zone or district and place it before the Board.

I have discussed this popular programme matter with many listeners and they say, as a rule, "Well, I tune into the Continent."

But this should not be necessary—a portion of the licence fee reaches the B.B.C. to provide us with entertainment.

A. J. YEATES.
Lincoln. [1134]



Protecting covers for short-wave coils, as suggested by C. A. C. Clarke in letter No. 1133

NOT an easy thing to "humanise," this radio. That has, in fact, always been the drawback of displays of radio apparatus—as such. More especially to non-technical listeners.

Perhaps that is why the B.B.C. shows at Radiolympia last year—to be repeated on an even more ambitious scale this—proved such a vitalising force of attraction.

Indeed, the shows must inevitably change the whole nature of the exhibition, which for too long has tended to be just a façade or window dressing—rows of dead sets bleating forth from their disconnected loud-speakers the common input of the B.B.C.'s far-from-perfect gramophone-record concerts.

With these shows staged on such a vast scale Radiolympia takes on a "draw" for millions where only thousands could have been interested before.

It was a memorable show, last year. Henry Hall acclaimed by the public for over three minutes at the end of a signature tune! Clapham and Dwyer clapped madly. And so



L.N.A. photo

Meet the girls! Pretty snappy, what? John Sharman puts the Rosalinde Wade dancers through their paces at Broadcasting House ready for the Radiolympia shows



Collins photo

And this is producer John Sharman himself

Hear Your Favourites at Radiolympia!

All About the B.B.C. Shows at the Exhibition



Fox photo

Stephen the Stainless One! Meet this old favourite, too, when you see the Radiolympia show

with all the rest of the stars. Listeners had come to pay tribute in person to artists silently applauded for a year.

Three radio-show programmes a day is the promise for this year. A terrific attraction. Moreover, the bill will be changed twice during the nine days of the exhibition, making altogether three distinctive shows—though some outstanding

features will be common to all three. Elaborate plans have been prepared whereby the ace B.B.C. variety directors are putting over a real handful of radio talent. Eric Maschwitz, the B.B.C. Variety Chief, will direct all the shows; John Sharman will produce them.

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Return of Phyllis Robins

This first show will feature Jass and Jessie—also the return of Phyllis Robins—of B.B.C. dance-band fame.

Sydney Baynes and his band will back up the numbers in his own delightfully entertaining way.

Those who do not manage to get into the theatre on the first three days can console themselves with listening-in to one of the two relays, scheduled for August 16 from 8 to 9 p.m. on the National, and on August 18 from 8 to 8.55 p.m. on the Regionals.

After the week-end break there will begin another three-day bill, from August 20 to August 22 inclusive—Monday, Tuesday and Wednesday. "In Town Tonight" will be a big feature, as will Henry Hall and the Wade girls again. Then we shall be able to see Arthur Prince and "Jim," as well as Jass and Jessie again.

Lily Morris will join this bill, as will Anona Winn and the Carlyle Cousins. Old-time Cont. on page 188

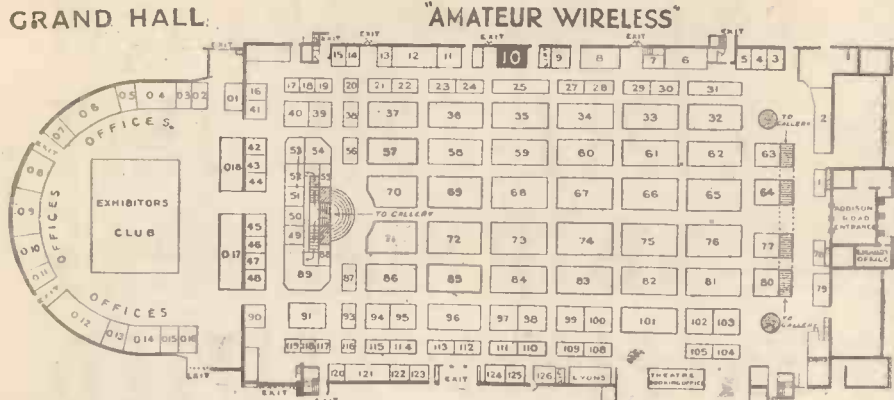


Fox photo

(Above) Sydney Baynes is puzzled with this jig-saw—but he likes it! (Left) Tessa Deane, another star of the Radiolympia constellation

Your Guide to Radiolympia

Alphabetical List of Exhibitors at Olympia



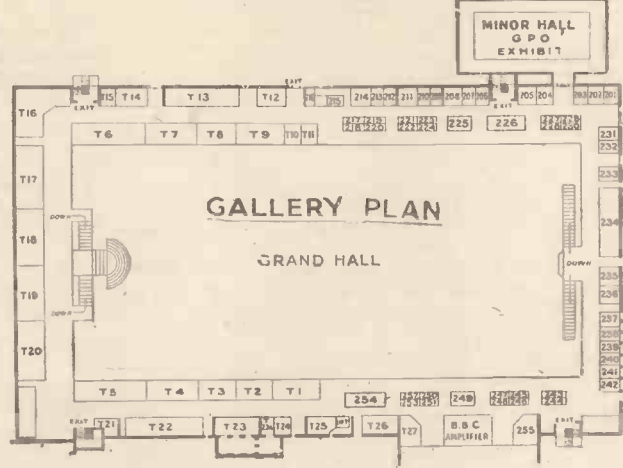
Meet Us at Stand 10!
 There will be many interesting things to be seen at Olympia this year, as we indicate in greater detail on other pages of this issue. But however short your visit to the Show may be, make certain of visiting the AMATEUR WIRELESS Technical Staff on Stand 10, where representatives of our associated publications—"Wireless Magazine," "Television," and "Radio Pictorial"—will also be in attendance to help visitors



The National Radio Exhibition at Olympia this year will be held from Thursday, August 16, to Saturday, August 25 inclusive.

The hours of opening are 11 a.m. to 10 p.m. and the price of admission is 1s. 6d.

Details of the B.B.C. Theatre, which forms a prominent feature of the Show, will be found on page 153. Full programme details will be found in the August 17 issue of "Radio Pictorial."



- Belling & Lee, Ltd. Stand 41
- Benjamin Electric, Ltd. Stand 42
Magnavox moving-coil loud-speakers of all types.
- Block Batteries, Ltd. Stand 31
Plateless accumulators for every purpose. New range of square-shaped low-tensions.
- Britannia Batteries. Stand 94
All sizes and types of Pertrix batteries for high tension, low tension and grid bias.
- British Blue Spot Co., Ltd. Stand 90
Permanent-magnet moving-coils with nickel-aluminium alloy magnets. Remote control for loud-speakers.
- British Rola Co., Ltd. Stand 48
Dust-proof loud-speaker chassis and wide range of permanent-magnet and energised types.
- British Radiophone, Ltd. Stand 97
Miniature five-valve super-het needing no earth. Vibrator unit for car-radio power supply.
- British G.W.Z. Battery Co. Stand 206
- British Pix Co. Stand 237
Valves, invisible aerial, armchair volume control.
- Bridger & Co., Ltd. Stand 216
- Birmingham Sound Reproducers, Ltd. Stand 235
- Wm. F. Brown Radio Co. Stand 229
Test apparatus of special interest to dealers and radio-design engineers.
- Bulgin A.F. & Co., Ltd. Stand 121
Immense range of useful components for amateur constructors. See silver-plated wire short-wave coils.
- Burgoyne Wireless, Ltd. Stand 102
- Burndept, Ltd. Stand 81
Etherdyne five-valve super-het with twin loud-speakers to avoid sound shadows.
- Burton, C. F. H. Stand 3
- Bush Radio, Ltd. Stand 82
- British Permel Enamelled Wire, Ltd. Stand 21
- Celestion, Ltd. Stand 28
Small permanent-magnet loud-speakers as well as a wide range for all purposes.
- Central Equipment, Ltd. Stand 4
- City Accumulator Co., Ltd. Stand 89
Super-hets, short-wave adaptor and push-pull quality amplifier.
- Clarke & Co., Ltd. (M/c). Stand 85
"Spectrum tuning" super-het with exceptionally interesting design of cabinet.
- Chloride Electrical Storage Co., Ltd. Stand 254
Full range of low-tension cells with state-of-charge indicators.
- Climax Radio Electric, Ltd. Stand 56
Full range of sets at reasonable prices.
- Cole, E. K., Ltd. Stand 72
Circular-shaped cabinet for universal mains set—good range of other sets in bakelite cabinets.
- Colvern, Ltd. Stand 38
New-type Ferrocart coils—an improved version of original production. Complete range of fixed and variable wire-wound resistances.
- Consolidated Radio Co., Ltd. Stand 20
- Concordia Electric Wire Co., Ltd. Stand 238
- Cossor, A. C., Ltd. Stand 73
Fine range of battery and mains sets—and new Melody Maker kit set for mains and battery working.
- Dallas, John E., & Sons, Ltd. Stand T12
- Darwins, Ltd. Stand 40
All classes of permanent magnets for manufacturers, including latest nickel-aluminium magnet alloys, cobalt steel and chrome steel.
- De La Rue, Thos., & Co., Ltd. Stand 5
- Dent, R. H. (Ardente) Stand 45

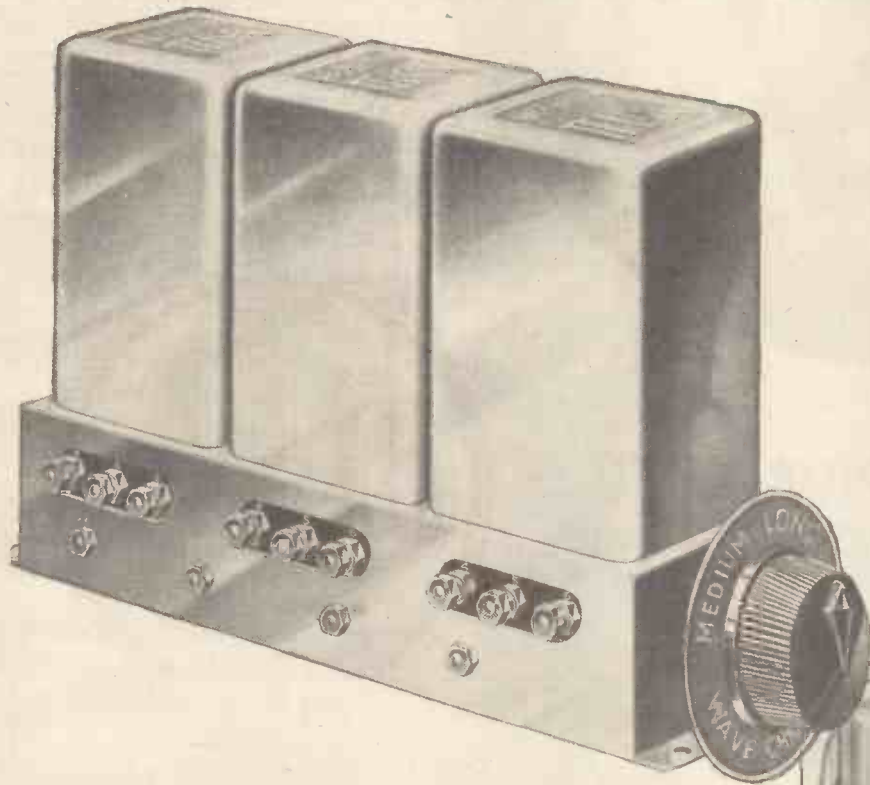
- Ace Radio Stand 19
Sets for battery, universal mains and A.C. operation.
- Adey Portable Radio Stand 115
- Aerialite, Ltd. Stand 253
Universal brackets and motor-car aeriars.
- Aerodyne Radio, Ltd. Stand 68
Lots of battery sets—and universal mains models. Tropical receiver for overseas listeners.
- All-wave International Radio and Television, Ltd. Stand 113
Universal A.C.-D.C. chassis, tuning from 15 to 2,000 metres in four bands.
- AMATEUR WIRELESS Stand 10
- Anson & Hopwood, Ltd. Stand 108
Automatic radio gramophone plays both sides of thirty records.

- Automatic Coil Winder & Elec. Equip. Co., Ltd. Stand 2
Avonimeter for testing every point in your set. The Avometer as well. Don't forget the coil winders.
- Automatic Radio Gramophone Co., Ltd. Stand 110
- Amplion (1932), Ltd. Stand 63
Lion Super permanent-magnet moving-coil loud-speaker chassis with 10-inch cone for super quality.
- Bakers Selhurst Radio Stand 242
New car-radio super-het with extension loud-speaker. All well-known Baker speakers too.
- Balcombe, A. J., Ltd. Stand 32
Super-het six-valver with searchlight tuning. In attractive cabinets.
- Beethoven Radio, Ltd. Stand 57
All-electric super-het with six valves and eight stages working twin loud-speakers.

Continued on page 157

Instant Success!

THE NEW TELSEN IRON-CORED TRIPLE-COIL UNIT WITH BUILT-IN SWITCHING, HAS BEEN IMMEDIATELY SPECIFIED FOR THE CRUSADERS' A.V.C.4



THE announcement that The Telsen Electric Co. Ltd. were introducing a group of Superhet, Band-pass and H.F. Transformer Coils with built-in switching, has created no less interest in set-designer circles than it has in the amateur home-constructor field, the immediate specification of the new Telsen Iron-Cored Triple-Coil Unit with built-in switching by the designer of the 'Crusaders' A.V.C.4' being a most eloquent tribute to its immediately-evident superiority. Suitable for a band-pass filter followed by one tuned stage, or for three tuned stages, its performance is such as to more than justify the tribute which has been paid **30/-** to it

TELSEN IRON-CORED SUPERHET COIL UNIT

with built-in switching. For use with a triple-ganged condenser, maintaining a constant frequency difference of 110 K.C. between the oscillator and signal frequency circuits. The preselector coils can, alternatively, be used as a band-pass unit **30/-**

TELSEN IRON-CORED TWIN-COIL UNIT

with built-in switching. Consists of two iron-cored coils, suitable for a band-pass filter or two tuned H.F. stages . . . **19/6**

TELSEN SHORT WAVE COIL

with built-in switching. Covers 18-31 and 30-56 metres. . . **7/-**



VISIT STANDS NOS. 75 AND 101 AT RADIOLYMPIA
Announcement of THE TELSEN ELECTRIC COMPANY LIMITED, ASTON, BIRMINGHAM

THE NEW "J.B." UNIVERSAL LINACORE

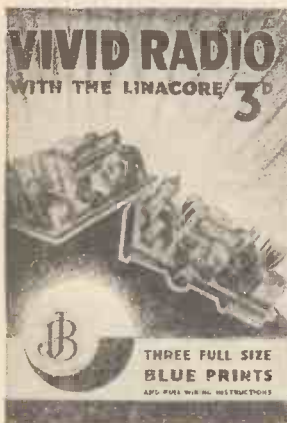


This new J.B. Universal "Linacore" Tuner is suitable for use with either Battery or Mains valves. It has been designed to make possible the construction of really efficient receivers with the minimum possible complication and the maximum certainty of success. It simplifies set building considerably—and is far more efficient and compact than if home assembled. Complete with volume and reaction controls and all switching. Use this new Universal "LINACORE" and get performance like a superhet!

J.B. "LINACORE" UNIVERSAL TUNER (for use with Battery or Mains valves) Model B.P.U. **65/-** (Cat. No. 2129)

SEE THE "LINACORE" AT STAND No. 114, RADIOLYMPIA

TO HELP YOU INCORPORATE THE "LINACORE" IN YOUR SET



We are offering you—for only 3d. (4d. Post Free)—a large broadsheet "Vivid Radio" containing three full-size blueprints and full wiring instructions for incorporating a "LINACORE" in your set. Post the coupon today, and be sure of getting your broadsheet before they are out of print!

FILL IN COUPON AND POST TODAY



COUPON

To Jackson Brothers (London) Ltd., 72 St. Thomas' Street, London, S.E.1.

Please send me "Vivid Radio": I enclose 4d. in stamps to cover postage, etc.

Name

Address

.....

..... A.W.

Your Guide to Radiolympia—Continued from page 154

- Dibben, Horace, Ltd.** Stand T21
Complete range of battery-charging plants for all purposes.
- Diggle, Alfred, & Co., Ltd.** Stand 13
Complete range of battery-charging plants for all purposes.
- Dublier Condenser Co. (1925), Ltd.** Stand 96
Reversible electrolytic condensers and interference suppressors—as well as usual wide range of condensers.
- Dyson, J., & Co., Ltd.** Stand T4
A.C. eliminators for high-tension supply, including trickle chargers.
- Earl Mfg. Co., Ltd.** Stand 240
- Eastick, J. J., & Sons** Stand T23
Special interest to short-wave fans—converters and adaptors of all types.
- Edge Radio, Ltd.** Stand 91
Range of good-quality receivers—don't miss model RG8 super-radiogram at 150 guineas. It includes a cocktail bar.
- Edison Swan Electric Co.** Stands 18 and 58
Mazda valves in an enormous range for every conceivable amateur need.
- Eldeco Radio, Ltd.** Stand 93
Super-het Stenode with frequency separation of 5 kilocycles. Battery super-het portable with patent swivelling lid.
- Electro Dynamic Construction Co., Ltd.** Stand 117
Interference-free rotary converter for radio sets and public-address equipment. Converters of all kinds.
- Erle Resistor, Ltd.** Stand 14
- Ever Ready Co. (G.B.), Ltd.** Stand 83
Over sixty different types of high-tension and grid-bias batteries.
- Everett Edgeumbe & Co., Ltd.** Stand 212
- Electrico.** Stand 246
- Ferranti, Ltd.** Stand 70
Good range of radio sets—see Lancastria Consolette and new Ferranti valves.
- Film Industries, Ltd.** Stand 207
Moving-coil microphone, public-address and permanent-magnet moving-coil and other good-quality P.A. equipment.
- Fuller Accumulator Co. (1926), Ltd.** Stand 124
New-type 10-volt high-tension accumulator and many other batteries.
- Garrard Eng. & Mfg. Co., Ltd.** Stand 54
Universal electric gramophone motor with many special points. Complete radiogram motorboard unit.
- General Electric Co., Ltd.** Stands 34, 66 and 225
Impressive range of sets for battery and mains operation, including new universal mains model.
- Gilbert, C., & Co., Ltd.** Stand T9
- Graham Farish, Ltd.** Stand 59
Large range of component parts for home constructors. See the new Formo range of components as well.
- Gramophone Co., The, Ltd.** Stands 33 and 61
Great range of very fine sets, including inexpensive automatic record-changing radiograms. See working exhibits showing factory testing procedures.
- Grosvenor Electric Batteries, Ltd.** Stand 104
- Goodmans (Clerkenwell), Ltd.** Stand 125
Permanent-magnet loud-speaker with new nickel-aluminium alloy magnet. Twelve-watt moving-coil loud-speaker with 11-in. cone.
- Goodman, J.** Stand 217
- Hacker, H., & Sons.** Stand 116
Radio gramophones of really outstanding merit, including seventeen-valve all-wave radio gramophone.
- Halycon Radio, Ltd.** Stand 36
- Hayberd, F. C., & Co.** Stand 24
Components for mains-unit construction.
- Harner & Simmons, Ltd.** Stand 209
- Hartley Turner Radio, Ltd.** Stand 119
Sets for the quality connoisseur; kit sets and, of course, Hartley Turner loud-speakers.
- Haynes Radio.** Stand 9
- Hellesens, Ltd.** Stand 78
Batteries of every type for high tension and grid bias.
- Henley's Telegraph Works, Ltd.** Stand 109
Solon electric soldering bits in several useful sizes.
- High Vacuum Valve Co., Ltd.** Stand 27
New range of mains valves, including screen-grids and full-wave rectifier.
- Jackson Bros. (London), Ltd.** Stand 114
Special interest to home constructor. See the new Baby Gang tuning condensers.
- Johnson Talking Machine Co.** Stand T13
- Kingsway Radio, Ltd.** Stand 44
Simpson electric turntable.
- Kolster-Brandes, Ltd.** Stand 84
The Pups stage a come-back! Also luxury radio gramophone and other good sets.
- Lampex Radio & Electric Co.** Stand 22
Battery and mains sets of all types, including universal mains radio gramophone.
- Lectro Linx, Ltd.** Stand 218
Clix connectors for every connection in wireless receivers. Also special air-sprung valve holders.
- Lugton & Co., Ltd.** Stand T1
Complete range of radio receivers as used by the leading manufacturers.
- Lissen, Ltd.** Stand 83
Wide range of receivers and four Skyscraper kits for the home constructor. Special exhibit of car radio.
- Mains Power Radio, Ltd.** Stand 230
- McMichael Radio, Ltd.** Stand 60
Five new sets, including super-het mains transportable and twin loud-speaker super-het with noise suppressor and automatic tone control.
- Manufacturers Accessories Co. (1926), Ltd.** Stand T24
Wide range of proprietary lines and Reliomat batteries.
- Marconiphone Co., Ltd.** Stand 76
Extensive range of wireless sets, including 20-guinea radio gramophone.
- Milnes Radio Co., Ltd.** Stand 249
Power-supply unit consisting of high-tension accumulator with nickel-cadmium plates in an alkaline electrolyte. Also permanent-magnet loud-speaker.
- Mullard Radio Valve Co., Ltd.** Stand 65
All the latest Mullard valves in a wide and comprehensive range. Also three-pentode battery-operated set.
- Multitone Electric Co., Ltd.** Stand 51
Deaf-aid equipment.
- M. & B. Radio.** Stand 210
- National Accumulator Co., Ltd.** Stand 226
- National Radio Service, Ltd.** Stand 215
All about set repairs and servicing.
- New London Electron Works.** Stand 39
Electron globe aerial and all their well-known aerial devices.
- Nuvollon Electric, Ltd.** Stand 236
High-fidelity relay and public-address equipment.
- Novo Radio Electric, Ltd.** Stand 17
Four-pentode set of very interesting design.
- Ormond Eng. Co., Ltd.** Stand 100
- Orr Radio, Ltd.** Stand 64
- Ossicaide, Ltd.** Stand 211
Public-address equipment of all types. Also deaf-aid amplifiers.
- Partridge Wilson & Co., Ltd.** Stand 29
New range of Davenset battery chargers, incorporating automatic overload switches.
- Philips Lamps, Ltd.** Stand 62
Interesting range of receivers at reasonable prices, including straight and super-het models for battery and mains operation. Include six-valve A.C. radio gramophone for 23 guineas.
- Plew Television, Ltd.** Stand 11
- Portadyne Radio.** Stand 71
Transportable super-hets of distinctive design.
- Powertone Products.** Stand 15
Portable wireless sets, including a universal D.C. mains model.
- Provincial Incandescent Fittings, Co., Ltd.** Stand 111
- Pye Radio, Ltd.** Stand 69
Special radio gramophone with new-type sound radiation for loud-speaker.
- Radio Gramophone Development Co., Ltd.**
Radio gramophones of distinction and loud-speaker and microphone equipment.
- Radio Instruments, Ltd.** Stand 92
Good-quality sets for the connoisseur.
- Radio Pictorial.** Stand 10
- Radio Society of Great Britain.** Stand 204
Special short-wave apparatus of interest to all keen fans—and a one-valve transmitter!
- Regentone, Ltd.** Stand 99
Model AS/35 seven-valve eight-stage super-het with Litz-wound coils.
- Reproducers and Amplifiers, Ltd.** Stand 53
Full range of loud-speaker chassis.
- Rist (1927), Ltd.** Stand 233
- Selecta Gramophones, Ltd.** Stand T11
- Siemens Electric Lamps and Supplies, Ltd.** Stand 77
Full-o-Power radio batteries—including special ranges of sizes made for makers' sets.
- Sonochorde Reproducers, Ltd.** Stand 43
Moving-coil loud-speakers, piezo-electric loud-speakers, pick-up and microphone.
- Sound Sales, Ltd.** Stand 203
Mains transformer, chokes and other useful home-constructor apparatus.
- Smith & Sons (M/A), Ltd.** Stand 47
Massed-plate accumulators.
- Stratton & Co., Ltd.** Stand 30
Specialists in short-wave apparatus—see the Sphinx receiver and many S.W. parts.
- Sunbeam Electric, Ltd.** Stand 35
Midget universal mains set of super-het type. Car radio without cable drive.
- Swift Levick & Sons, Ltd.** Stand 118
- Sinclair Speakers, Ltd.** Stand 232
- Tannoy Products.** Stand 95
Mobile P.A. amplifier, horn-type loud-speakers—and band amplifiers.
- The 362 Radio Valve Co., Ltd.** Stand 244
- Telegraph Condenser Co., Ltd.** Stand 37
Varied range of all types of mica and paper condensers, dry electrolytics and new interference suppressor.
- Telephone Mfg. Co., Ltd.** Stand 105
- Television.** Stand 10
- Telsen Electric, Ltd.** Stands 75 and 101
Fine new range of sets for battery and mains operation, featuring Pointograph tuning dial. Also good range of parts—see the screened iron-core coils gangs.
- Ultra Electric, Ltd.** Stand 67
Clock-face tuning featured in a range of value-for-money sets.
- Vandervell, C. A., Ltd.** Stand 234
Re-chargeable high-tension accumulators are a special line—and see the wide range of all types of accumulators.
- Varley.** Stand 103
Duo-nicore tuning coils are a new line in a wide range of parts—including a new-type permeability tuner that can be used with super-het circuits.
- Vee Cee Dry Cell Co. (1927), Ltd.** Stand 126
- Voight Patents, Ltd.** Stand 255
Specially designed loud-speakers for public-address work.
- Westinghouse Brake and Saxby Signal Co., Ltd.** Stand 86
- Weston Electrical Instrument Co., Ltd.** Stand 339
Testing meters for all purposes—and new oscillator test set.
- Wharfedale Wireless Works.** Stand 205
Moving-coil loud-speakers to suit every reception need.
- Whiteley Electrical Radio Co., Ltd.** Stand 98
Stentorian range of loud-speakers—good quality and reasonable prices.
- Wingrove & Rogers, Ltd.** Stand 87
- Wireless Magazine.** Stand 10
- Wright & Weaire, Ltd.** Stand 1
General-purpose iron-core coil. New oscillator coil for super-hets. All parts to interest home-constructors.

All About the New Components



Stentorian by name and—we assure you—in action! The latest addition to the popular W.B. range of moving-coil loud-speakers



Baby-gang condenser in the Jackson range—a three-condenser unit in plain and super-hot types—very useful to home-constructors

At no time in the history of radio has the amateur constructor had such a wonderful chance to enjoy his hobby of home set-building as during the present season now dawning upon us.

The year 1934-35 will undoubtedly prove that it is possible for the home constructor to build sets not only as efficient as the modern commercial types, but as cheaply—if not cheaper.

Ahead of Commercial Practice

There will be the further advantage that, with all these new valve types, new and hitherto untried circuit combinations will be tried out—enabling the amateur to put himself miles ahead of current commercial practice.

At last the manufacturers have got down to some sort of standardisation in component parts. The bulk of the important firms are now making their tuning coils, for example, to a pre-determined inductance. The condenser manufacturers are making condensers also to pre-determined limits of accuracy as to maximum and minimum capacities.

Easy Tuning

As these condensers have scales calibrated in wavelengths it follows that when the set is made up with the new standardised inductances and capacities, the markings on the scales will be of real value—and will, in fact, be accurate enough to enable stations to be identified by reference only to the scales, thus saving a lot of trouble searching for foreigners.

With the introduction of high-frequency transformers, such as the new Telsen range, a receiver such as the Crusaders' A.V.C.4—to give a typical example—dispenses with many components, such as high-frequency chokes and blocking condensers. In other words, develop-

ments in high frequency couplings are tending to cut down the number of components needed—and thus the overall price of the set is again reduced.

In addition to this advantage, the efficiency is better. The high-frequency transformer gives greater amplification when used with a high-frequency pentode—a valve that anyway gives more amplification than the old type screen-grid.

To the average reader of "Amateur Wireless" new components have a special appeal. For YOU—dear average reader!—thrive on experimenting with new components. There is no lack of novelty and improvements in this year's Radiolympia crop, as the accompanying three pages adequately testifies. We review in brief the high-spots of an array of radio components and accessories that for complete appreciation need your personal and detailed inspection. Radiolympia offers you an invaluable chance to fulfil this important and absorbingly interesting engagement. Read these pages and then get going to that radio show!

High-frequency pentodes used as detectors will also help to cut out still more components—the low-frequency transformer, for example, is not needed with such a valve, as resistance-capacity coupling besides giving better quality gives more stage gain with such a high-impedance valve as the pentode.

Higher Impedance Valves

Of course, this evolution has been gradual. Last year, you will remember, the low-frequency transformers were nearly all of the parallel-feed type, this being necessary in order to match the external impedance to the valve. From this we have developed the idea of a still higher impedance valve, and from that the resistance-capacity system of coupling has automatically evolved.

Old hands at the radio game will see in these typical developments a striking repetition of early history. For it so happens that right at the beginning of the past decade high-frequency transformers were widely used, and so was resistance-capacity coupling. You must not imagine that we are going backwards—it so happens that certain old ideas are now finding renewed application through the development of special valves—which did not exist in the early days.

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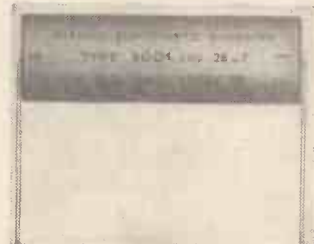
Important Links

Perhaps it will be as well to start this brief review of new components by citing the most important links in the whole receiver chain—the valves, more especially as they so largely determine the design of allied components in anode and grid circuits.

The most important valve development of the year is probably the double-diode-triode. This valve is for mains of all types and for batteries. It enables the home constructor to obtain diode detection with its advantage of distortionless rectification and provides



Heyberd's transformers have long been known to amateurs—here is a selection from the big range designed for mains working. You will appreciate the terminal contacts



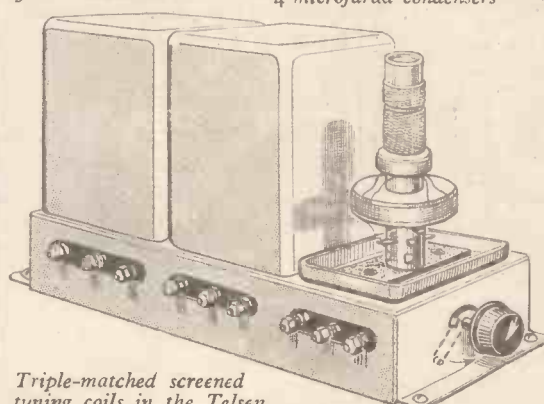
Dubilier 25-microfarad electrolytic condenser



To suppress interference, this T.C.C. unit is very useful. It consists of two 2-microfarad condensers and fuses. Larger unit now available with 4-microfarad condensers



Nickel-aluminium alloy is used for the magnet of the de-luxe model moving-coil loud-speaker by Milnes Radio



Triple-matched screened tuning coils in the Telsen range for use in aerial and anode circuits. Wave-changing is by cam-operated rotary switches

an easy means of obtaining self-adjusting volume control.

Even with the diode detector, thanks to the triode inside the same bulb, more overall amplification is obtained than with the old simple triodes used as detectors.

Coils for the New Valves

All of the snags that have been so annoying in the past with super-hets have now been overcome by the introduction of heptodes, octodes, pentagrids, and other types of special frequency-changers. Fortunately, various coil makers have got down to the design of suitable coils for these new valves, with the result that it is possible for the home con-

A short-wave oscillator constructed on Micalex, having a very high order of insulation unaffected by temperature, has now been released by Wearite (Stand No. 1). This oscillator has been designed for use with the other Wright and Weaire short-wave coils, which are also wound on the Micalex material.

Stripped components by Ward and Goldstone ought to interest all home constructors (Not at Show). Besides being distinctly cheaper than the ornate components of other days, these components—especially the coils—are more efficient.

The new Goltone intermediate-frequency transformer should appeal to the home constructor. It has a variable coupling between primary and secondary, enabling the selectivity to be adjusted between 7 and 20 kilocycles, giving a great advantage over most commercial sets with fixed selectivities.

Telsen (Stand Nos. 75 and 101) high-frequency transformers with internal switching are also worthy of your keen attention. These components have dust-iron cores, and are used in our great Crusader set—the A.V.C.4.

For the short-wave fan, Telsen's have designed a coil that will tune from 18 to 56 metres, again with internal switching—a combination coil that should be in great demand by all short-wave fans this season.

Forno's tuning condenser (Stand No. 59) is worth seeing when you are at the show. The dial gives you the effect of being integrally mounted, but does not require a large hole—



Amplion Lion Super claims to represent the last word in loud-speaker design—to include all known refinements. Special quality model has 10-in. diameter cone



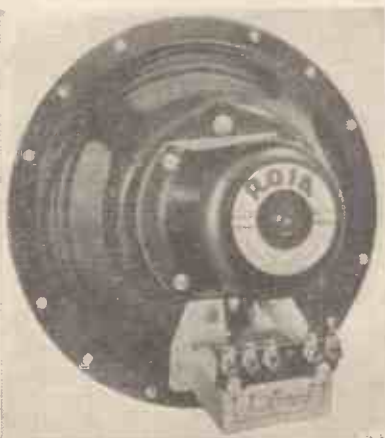
R. and A. Multimu moving-coil loud-speaker with very wide range of circuit applications, including push-pull output

structor to take full advantage of them immediately—this is a distinct advance over preceding valve introductions.

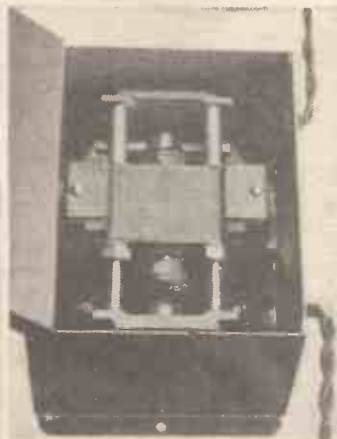
Besides the Duo-nicore tuning coils that Varley (Stand No. 103) have brought out this year they have a special range of oscillator coils for frequency-changers.

New Permeability Tuners

Permeability tuners, which were supposed to revolutionise amateur radio last year, failed to materialise in any numbers. The Varley permeability tuner, though, has been designed to take the place of not only a four-stage tuning coil—but a four-gang condenser as well. It can be used in straight or super-heterodyne sets. By connecting a padding condenser across one section it can be used as an oscillator.



Dust and dirt are entirely excluded from the air gap and speech coil of the recently introduced Rola moving-coil loud-speakers



For your new car-radio outfit this high-tension converter by the Electro Dynamic Construction Co. ought to be seen. Three output sizes for all types of car-radio equipment



Hivac include this A.C. pentode output valve in their mains range—AG/Y, with an output of 3,400 milliwatts

tionary development—especially in view of the low cost.

T.C.C. (Stand No. 37), who originated the electrolytic type of condenser, have now introduced special reversible types for a working voltage of 275 volts, suitable for the new universal and D.C. receivers.

High-Capacity Electrolytics

With the introduction of energised moving-coil loud speakers, very high-capacity and comparatively low-voltage electrolytics are needed—for they eliminate the final traces of mains hum. A special condenser of this type is the new T.C.C. 501, which has a capacity of 2,000 microfarads.

Heyberd's (Stand No. 24) have long been recognised as good people for the amateur wanting apparatus and components for mains-unit construction. This year the firm is marketing a special mains unit designated 15/50, which gives an output of 150 volts, at any current between 15 and 50 milliamperes—the regulation is that good.

This unit is suitable for small receivers, power amplifiers and also for class-B output. Heyberd's are also showing a very complete range of the sort of parts you need for making your own mains apparatus.

The Ferranti M1 loud-speaker (Stand No. 70), so popular for many years, has now been re-designed, fitted with a new method of

When you turn the knob on the side of this Pifco Rotameter separate dials appear for testing voltage, amperage and resistance

which the average constructor has difficulty in cutting.

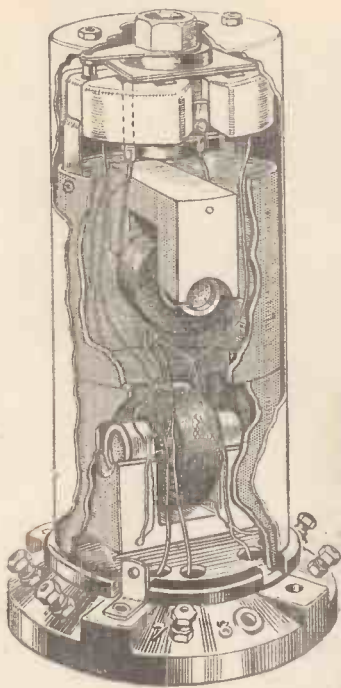
Screened paper condensers are long overdue. The new Forno condensers are housed in what look like electrolytic condenser cases. These are 375-volt working, the prices being distinctly lower than the average. For example, a 1-microfarad condenser costs only 2s. Forno has also introduced a litz-wound tuning coil for 5s. This is a revolu-

suspension, a new magnet of aluminium steel, and a gap 1/2 inch deep.

Super-Quality Output

Talking of super loud-speakers, the new Amplion Lion (Stand No. 63), which at one time stood almost alone for really good quality, reappears as a permanent-magnet unit with a specially large cone for super-quality output. It is claimed to embody all the latest refinements and is supplied with a special input transformer of between 1 and 20 ohms, and a 2,000 to 40,000 ohm primary, with a completely sealed gap. There is a built-in tone control.

W.B. (Stand No. 98) claim this year that it



Duo-nicore intermediate-frequency transformers, produced by Varley, help home constructors to make accurate adjustments in super-het sets

is unnecessary to pay more than 2 guineas for a high-quality loud-speaker. To back up this contention they have produced three new loud-speakers, the Senior of which is called the Stentorian costing only 2 guineas.

The Baby Stentorian costs £1 2s. 6d. and ought to appeal to a large number of listeners wanting a good but inexpensive extension loud-speaker.

Still another loud-speaker that will cause a stir is the Magnavox 66, (Stand No. 42), a beautifully finished unit in black and chromium—for either A.C. or D.C. working. It is supplied complete with field coil of 700 ohms, a hum-neutralising coil and a universal input transformer.

This unit has a 11-in. seamless cone and a

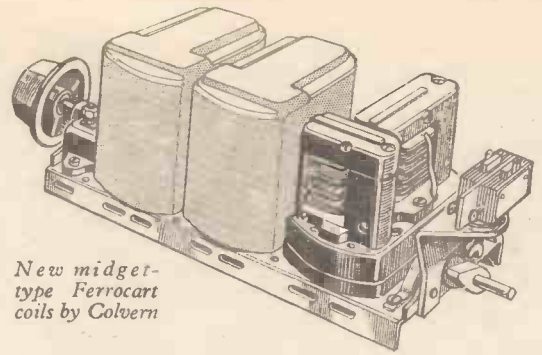


Kneeling figure of a girl—very modern!—forms a striking decoration for Bulgin signal lamp

to be found on the Benjamin stand. Jackson's (Stand No. 114) have some very small and compact two- and three-gang condensers, fitted with very wide and open tuning scales. A condenser that ought to interest the constructor is the Linatuner, with 5-inch horizontal tuning scale—actually the one used in the A.V.C.4 set described elsewhere in this issue.

One of the points of special appeal about this condenser is that the indicating bulb travels behind the pointer so that the maximum light is always where you want it—behind the station setting you are looking for.

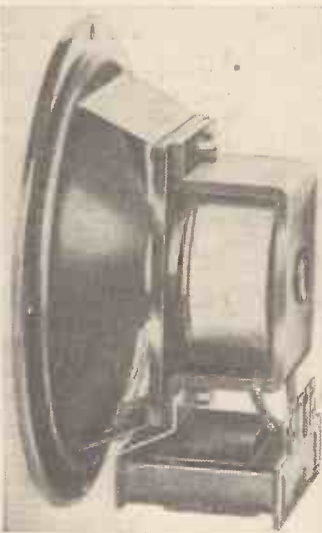
For any serious constructor the use of a meter is essential—and there can be few more widely applicable test units than the new Avominor, which is on the stand of the Automatic Coil



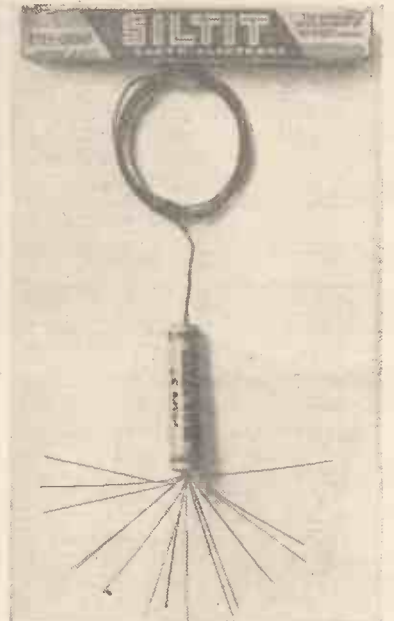
New midget-type Ferrocart coils by Colvern

types tested at 2,000 volts, D.C. are also shown. No longer will it be necessary to wonder if your accumulator is just on its last legs—for the Exide accumulators (Stand No. 254) this year are all fitted with tell-tale indicators showing the exact state of charge of the battery cells.

In a discussion on new components we must not overlook the development of the neon and visual-tuning indicators. For example, on the Cossor stand (No. 73) you will find a neon-gas tuning device that can be used in almost all four-valve home-built sets, or sets with more than one stage of high-frequency amplification.



For midget-type sets this model E5 Celestion moving-coil loud-speaker has been introduced. It is only 17s. 6d.



The Siltit earth has a copper tube filled with moisture-attracting compound

You can gain an idea as to how this Cossor device works in practice by looking at Cossor's own sets and the sets of other makers.

Variations on this idea can be seen in the Ferranti, R.G.D., and Telsen sets. Visual tuning is undoubtedly a coming thing, which the keen amateur certainly ought to consider.

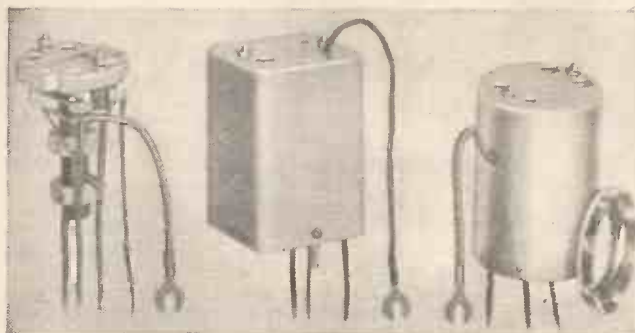
High-insulating materials are being used for coil mountings, valve holders, coil holders, and all sorts of short-wave components. One such material, known as Steatite, is utilised in Goltone coils, Radio-Phone condensers, and by Stratton's in most of their short-wave ports.

Bulgin's (Stand No. 121) have also struck a new note by the use of silver-plated wire for their short-wave coils.

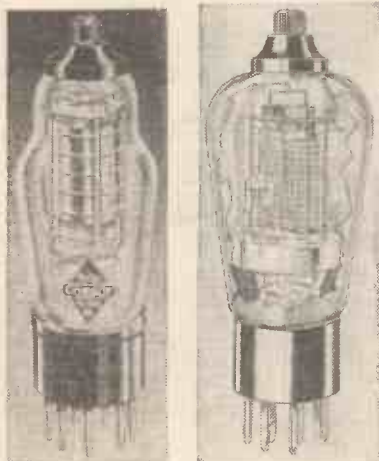
Winder Co. (Stand No. 2). This costs £2 and with it you can read current from 100 micro-amperes to 120 milliamperes, .1 volt to 300 volts, and resistance values up to 3 megohms.

On Stand No. 4 is the No-Mast Aerial gadget—which everyone with a limited space ought to see. It can be erected by knocking in six nails. Total space wanted is 12½ inches. Signal pick-up is claimed to be almost equal to that of an ordinary aerial.

T.M.C. (Stand No. 105) have now turned their attention to fixed condensers. Very good value they seem to be, too. The stand consists very largely of paper di-electric condensers made under Hydra patents—every possible type being shown. In metal cases, they are suitable for 250 to 750 volts working, while special non-inductive tubular



Intermediate-frequency transformers in the Goltone range are intended for use with double pre-set condensers



One of the Cossor brigade! Type 41MPG indirectly heated pentode frequency-changer for super-hets. Take a look inside this Mullard 2-volt variable-mu high-frequency pentode. The valve is called type VP2

frequency range of between 40 and 9,000 cycles—it ought to sound pretty good. By the way, remember that Magnovox loud-speakers are

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An extraordinary new magnetic material, exclusive to W.B. Stentorian Speakers, gives double the strength of an ordinary magnet at the same cost.
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- **INNUMERABLE ADDED REFINEMENTS COMPLETE A BRILLIANT DESIGN.**
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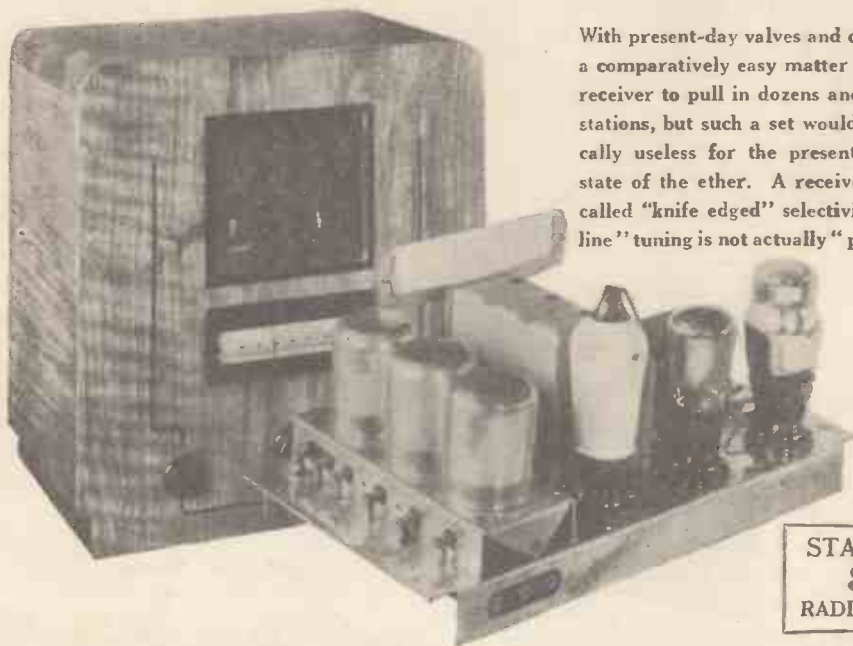
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selective." Incredibly fine tuning causes considerable distortion. To be selective while retaining all the essentials for good-quality reproduction, each programme must be picked out boldly from the surrounding chaos. That is exactly what this new Lissen Band-Pass 3 does. Programmes hitherto spoilt by overlapping stations, now received clean and bright by reason of the three tuned circuits—programmes spoilt by excessive side-band cutting, now received full of depth and detail by reason of the band-pass circuit and the Power Pentode Output coupled to the fine moving-coil loud-speaker. No other receiver can possibly give you a greater sense of complete satisfaction.

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On Your Wavelength!

Coming to Olympia?

OF course you are, if you can possibly manage it by hook or by crook. And it's going to be *some* Exhibition this time. It's bigger than ever and you will see the wonderful things that our manufacturers have accomplished during the past twelve months.

In one way it's going to be, if I may so put it, just like last year—only more so. What I mean is that you will see the superhet here, there, and everywhere. There'll be straights, too, of course, and some jolly good straights; but the superhet is unquestionably the set of the year.

How to See the Show

LOTS of people arrive at the big doors of Olympia with just a vague idea that they want to see the exhibition. Once they are inside they realise that, unless they can spend several days over the job, they have taken on a pretty big thing.

I don't know how many miles you would have to walk to inspect the whole of each stand, but it would certainly work out to something quite considerable, and the only result of an attempt to do so in one day would be that your brain was as tired as your body and that you'd come away with somewhat confused impressions.

Much the best tip is to make up your mind beforehand what you most want to see. Go straight away to the stands that contain your particular requirements. Inspect them thoroughly and devote what time is left to a general wander round.

Thermion's Guide

HERE'S a rough idea of the way in which a day at Olympia can be planned. Of course, you want to see the latest things in valves. Therefore go, first of all, to one of the big valve maker's exhibits and "do" it thoroughly.

Next, if you are a really keen wireless man, particularly if you are a Constructor Crusader, you will want to see the new season's components. Well, you know the big component people and the guide on page 154 will tell you where their stands are.

Before, though, you visit them I rather recommend you to make your way to the "A.W." and WIRELESS MAGAZINE stand—No. 10—where you can obtain any information you want about the show and you can find out what novel gadgets there are that are specially worth a visit from you.

Finished sets will probably claim your attention next, and if you go round the stands of

By THERMION

half a dozen of the foremost firms you will have got a pretty good idea of what's on view.

That done, you can look round generally for interesting things and can devote some of your time to the side shows.

Value for Money

ONE thing that will surprise you pleasantly is the extraordinary value for money offered at every stand. Superhets this year, with S.A.V.C., tone control and tuning indicators, will be offered in many cases at prices that wouldn't have bought a mains three-valver a couple of years ago.

But don't, I beg you, go to the Exhibition with the fixed idea of buying a set with the greatest number of valves for the lowest possible price. Better a four-valver with a thoroughly good performance than a set with twice as many tubes at the same price that gives indifferent reception and is always liable to go wrong.

Universal Sets

ONE of this year's big features will be the universal or A.C./D.C. set, to which makers have been paying an immense amount of attention during the past few months. In the best of them all the snags have been removed and the good A.C./D.C. set is perfectly safe to use.

If you live in a D.C. district and don't quite know when the change over to A.C. is going to take place, you cannot do better than invest in a receiver of this kind. They function equally well on either type of supply and when your mains go over from D.C. to A.C. the set just goes on working whilst you go on smiling.

Car Radio

OLYMPIA will have a fine selection of car-radio sets, and if you are a motorist I recommend these to your august attention. Recently, I have done a good many car trips in radio-equipped vehicles, and I must say that I have found wireless a great boon, particularly on long journeys.

I don't keep mine going continuously and I never have it working when driving in traffic. But it is a great joy to be able to switch on every now and then, particularly when there is a news bulletin or a sporting running commentary coming through.

And when you stop for a few minutes' easy and a cigarette, a little restful music is just the thing you seem to want.

. . . And Car Batteries

DON'T forget, though, that your car-radio is worked from the starting and lighting battery and that it requires several amperes for its operation. If, therefore, your battery is only just up to its present work, or if it is an oldish one and is growing rather dicky, you had better make quite sure before fitting car radio that it will stand the extra load imposed upon it.

One friend of mine found it very poor fun on the hottest day of this year when, after he had listened to wireless for half-an-hour by the roadside, his self-starter refused to function!

It is rather important, too, to make sure that when you are running along with the radio set at work the charging rate is sufficient to cover both its requirements and those of the ignition system.

Cabinet Designs

YOU will see a few freaks in the way of cabinet designs at Olympia, the kind of lopsided, bulgy, lumpy things that for some quaint reason are called modern or, worse still, modernistic.

But you will also find some really beautiful cabinets on many of the stands.

The two materials largely used this year are wood and bakelite. Since bakelite is moulded, you can do pretty well anything you like with it in the way of shaping and ornamentation and you can turn out good-looking cabinets at remarkably small cost.

Myself, though, I delight in beautiful woods. It is just my own view, of course, but for wireless cabinets I don't think that you can touch such lovely materials as mahogany, oak, walnut, rosewood, and maple.

But, then, I'm workshop-minded and to me beautiful woodwork is a sheer joy in itself.

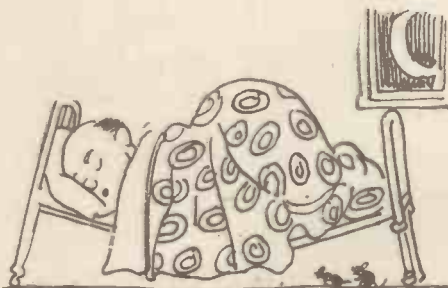
There are many who prefer bakelite, and no one can deny the beauty of both the form and the colour of good bakelite cabinets.

Light and Sound

FLOOD-LIGHTING applied to sound is the description of the dual-speaker unit, which is, I am told, going to be a big feature at the Show. The two speakers are set at slightly different angles, so that they distribute the sound equally over the whole room, leaving no acoustic shadows or dead spots. In addition, the overall frequency range is considerably wider than that obtained from a single instrument.

Carrying the analogy a step further, "lighting" will also be a definite feature at the

RADIO TERMS ILLUSTRATED By OUR CRAZY ARTIST



HEAVYIDE LAYER



180 DEGREES



A HOOK UP



H.M.V. photo

tuning end of the set. Most S.A.V.C. models are now fitted with visual-tuning indicators, which, apart from their purely technical merits, add an attractive touch to the general appearance of the set. In fact, I shouldn't be at all surprised to see light-tuning become a standard fitting, whether S.A.V.C. is used or not.

This Year's Valves

JOLLY good news—wasn't it?—that battery valve prices had once more been reduced. I am going to award myself one of my own pats on the back, for a couple of years ago I wrote in these columns that we would one day see the general-purpose valve at a price in the neighbourhood of five bob.

The prices of mains valves remain where they are for the present, but I shouldn't be surprised if there is good news for mains users before so very long.

One thing I am glad of is that our manufacturers have sternly repressed the tendency to pack the bits and pieces of several valves into one bulb. Portmanteau valves are all very well in their way, but one big trouble is that if a filament or heater "goes" you are in for a pretty expensive renewal. With the pentode and the heptode we have gone quite far enough in that direction.

Wireless on Hire

HOW many readers, I wonder, know that certain makes of wireless sets can be hired on very advantageous terms? The scheme is a thoroughly sound one and quite a few of my friends make use of it. Here's how it works out.

A brand new set is installed in your house and you agree to pay a rental of so much—and it's a remarkably small "so much"—a month. In return the renters agree to keep it always in perfect condition at their expense and to replace it with the most up-to-date model every two years.

You thus know exactly where you are in the matter of running costs and repairs. You are never landed with an out-of-date

My Lady's Radio!

(Left) Good taste—her ladyship knows a good set when she tunes it! With tuning scales calibrated in wavelengths and statics it is now easy for feminine listeners to find their favourite programmes—be they ever so non-technical.

(Below) With a super-hot portable on the French Riviera—another example of having it both ways, enjoying the sunshine and broadcasting at the same time. Don't you wish you were there?



H.M.V. photo

set, and if at any time you want to buy outright the one on hire you can do so, a proportion of the rental paid being credited towards the purchase price.

It's a good idea, particularly for those who have no technical knowledge and want up-to-date and trouble-free wireless.

Good for Baden

THERE is no "man-made static" now in the German town of Baden-Baden. This highly desirable state of affairs is the result of a combined "drive" on the part of the local



Radio livens up the cadets' camp life! Here you see boys of Christ College, Finchley, operating a 20-metre transmitting and receiving apparatus—an interesting aspect of activities during the encampment of Public Secondary Schools at Cirencester.

civic and police authorities, assisted by the national broadcasting company and Post Office officials.

The two latter bodies took a hand in the experiment in order to investigate the position before framing a set of compulsory laws against broadcast interference in general. Baden was selected for a try-out because it is a fashionable health resort and contains more than the normal proportion of high-frequency medical appliances, which are particularly troublesome from the listener's point of view.

Altogether nearly 7,000 sources of local interference were silenced, thanks to the willing spirit shown on all sides. To some extent this was fostered by the fact that the static "silencers" were offered at specially reduced rates.

Of this the Post Office paid two-thirds to the owners of apparatus who voluntarily came forward within a given time. Presumably the others—if there are any left—will be forced by the new law to put matters right at their own expense and at full cost.

Thrilling Experience

ALTHOUGH the American attempt to reach the stratosphere must, from one point of view, be called a failure, the explorers can undoubtedly count themselves lucky in escaping with their lives. The account of the trip gave a real thrill to those listeners who picked up the story broadcast by the aeronauts themselves up to the time when they had to take to their parachutes. Unfortunately, the recording instruments were damaged in the crash, so that it is doubtful whether the trip will throw any fresh light on the stratosphere—or help to solve the mystery of the cosmic rays.

An interesting theory, which still remains to be proved, is that the moon creates tides in the stratosphere, just as it does in the sea, and so exercises a definite influence on the transmission of wireless signals.

Good for the Listener

THE other day I was chatting with that dynamic personality, Mr. Carleton Dyer. He told me in confidence something of a new scheme shortly to be launched—it may be made public by the time that this appears in print—which sounds like a bit of real good news for the listener. I cannot yet tell you what it is, since my lips are sealed for the moment; but when the details of this scheme are announced, it will create a pretty considerable sensation.

Radio Takes the Helm!

Once again the Marchese Marconi has demonstrated his capacity to capitalise his original radio research—this time by the development of a foolproof system of ultra-short wave beacon signalling to guide ships into harbour even when visibility conditions are extremely bad

THEN the chart-room blinds were drawn and, entirely without sights, the navigator steered the yacht back through the entrance of the harbour. You are right—radio took the helm. Once again Marchese Marconi had shown his faculty for making practical use of original radio research.

The occasion was a demonstration of the Marchese's latest wireless navigation apparatus at Sestri Levante, near Genoa. His famous yacht *Elettra* was equipped with 60-centimetre receiving apparatus, in touch by radio with one of the new type transmitters on the hill behind Sestri Levante, about 300 feet above sea level.

Culmination of Intensive Research

Thus comes about the culmination of three years intensive work by the Marchese on the behaviour of ultra-short waves. His latest aid to navigation may well prove his greatest—for it will enable a master to navigate his ship on a straight line into the most difficult harbour entrance, even with the worst visibility. Moreover, the apparatus will give the correct bearing of a ship in relation to the radio beacon.

This ultra-short wave system has the advantage of great accuracy over existing direction-finding systems and beacons. It is not only very accurate but amazingly simple, free from all known forms of outside interference—and quite inexpensive.

For the demonstration in the Gulf of Genoa, the yacht *Elettra* steamed out to sea with Marchese Marconi's guests on board. When

about ten miles out it was turned round for the voyage back to Sestri Levante, where two buoys were anchored in the bay to act as the imaginary entrance to a harbour.

Then the ship was taken about two miles off its course, in order to show how it could then be brought safely through the "harbour" while depending entirely on the action of the new automatic



Marconiphone photo

A new picture of the famous inventor—the Marchese Marconi—who has now added further laurels to his wonderful radio achievements

system. Signals from the beacon station were audible in the chart room through a loud-speaker, but in addition they were recorded visibly on a dial, divided into two sections, one half red and the other green.

As the ship was off its course, the pointer indicated this on the dial by swinging more to one side than to the other. Moreover, the audible indication of this off-course position of the



Wide World photo
Marchese Marconi, his wife, and guests on board the "Elettra" during the successful demonstration of the new radio-beacon system. This picture came over by air

ship was given by the loud-speaker, dashes on different notes giving port or starboard by their distinctive tones.

From these indications the navigator was able to get the ship back on to its direct course, and this was then shown by the even swinging of the pointer between the two sections of the dial—and at the same time by the character of the notes in the loud-speaker.

All the navigator had to do after that was to keep the ship's course in such a way that the pointer was dead between the two sections—meaning the ship was heading straight for the opening representing the harbour.

Simultaneous Radio and Air Signals

Within a two-mile limit the navigator can also determine from the new apparatus his exact distance from the harbour. This is very simply done by arranging that the transmitting beacon shall miss one tone beat every fifteen seconds. The next signal is then sent out simultaneously as a wireless signal and as an air-wave signal from a powerful loud-speaker.

The navigator then notes the exact instant of arrival of the wireless signal on a stop watch, and waits for the more slowly travelling sound-wave signal, which is picked up on the ship by a tuned microphone. From this time interval it is, of course, easy to work out the distance, since the wireless signal can be taken as instantaneous and the speed of sound waves is known. The harbour beacon station is really quite a small affair; about 6 ft. high and 4 ft. wide. Two small aerials and reflectors are mounted at right angles to each other on a platform forming the top of a cylindrical base.

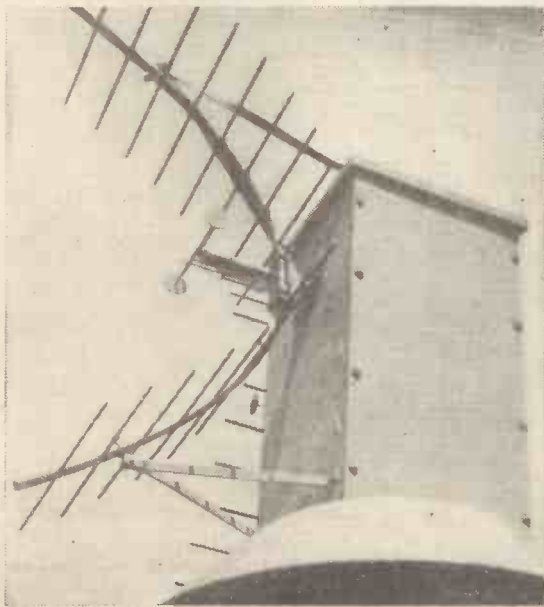
The whole platform and the aerial system swings left and right continuously about 2 in. from the centre line pointing to the harbour entrance. The aerials themselves are only a few inches long—don't forget the wavelength is only 60 centimetres!—and the reflector is only 3 ft. high.

Zones of Silence

Strange as it may seem, the idea of the swinging transmitting system is to create not the usual beam of wireless signals, but a narrow zone of silence. This zone comes at the centre of a purposely wide beam.

It could have been very simply arranged so that the zone of radio-signal silence coincided with the centre line of the harbour entrance, but this was thought to be too negative an indication for the navigator. So the zone of silence swings from left to right of the centre line—only a small swing, actually 6 degrees, being necessary.

When swinging towards the left, the beacon note is high; when swinging to the right it is low. The change of note takes place when the zone of silence coincides with the line for entering the harbour; it is bounded on each side, that is to say, by audible and distinctive limits. A great achievement!



Wide World photo
Part of the aerial system used for the 60-centimetre reception of the beacon signals. Two parabolic reflectors at right angles are in the foreground

Finding Your Way with a Meter

Using a Simple Combination Instrument to Test Your Set



No set designer can work without plenty of meters to check up what is happening at various points in the circuit

HAVE you ever spent hours and hours trying to fathom why your set has gone off colour? Have you ever been led right up the garden path by some mysterious fault, and then, after much hair-tearing and many uncomplimentary remarks about your latest radio creation, given it up in despair?

If only you had been able to get hold of that "posh" meter which your pal Brown has... well... the job would have been simple. A really good milliammeter and voltmeter is the cause of more envy than any other component. It has not always been within the reach of every amateur's pocket, as an accurate instrument used to cost quite a lot of money.

Within Our Price Limit

Many still do, but there is one instrument now on the market which not only falls within the limit of our budget as regards price, but it also offers the facilities which in the old days could only have been obtained from nine separate instruments.

Every amateur and constructor must have heard of the famous Avometer and longed to possess one. They have no doubt been prevented from realising their dreams by the question of £ s. d.

The makers of the Avometer decided that the amateurs should have a really reliable testing instrument, and by expending vast quantities of thought and grey matter produced a younger brother of the Avometer and duly named it the AvoMinor.

This only costs the modest sum of forty shillings, and offers the facilities hitherto only associated with its big brother. It is only 4 in. by 3 in. by 1 3/4 in. in size, and is housed in a handsome leather-finished case.

A very handy feature is provision of a pair of insu-

lated testing prods and leads fitted with interchangeable crocodile clips. These are most useful as they allow readings to be taken on parts of the set which would be inaccessible under ordinary conditions.

The actual instrument is of the moving-coil type, and can be used with the utmost safety and accuracy for any direct-current, voltage and resistance measurement. Without any external shunts—a great blessing this—it is possible to read the current in a circuit as low as .1 milliampere up to a very generous maximum of 120 milliamperes.

On the voltage scale it goes from 1 volt to 300 volts, while resistances can be measured from zero to 1,200,000 ohms.

The combination of such wide ranges is really wonderful, as it renders the meter applicable to so many tests. The makers claim "any and every test with ease and accuracy," and this is certainly no exaggeration when one is concerned with the direct-current side of radio measurements.

Each range of units is divided into three. For example, it is possible to read from zero to 6, zero to 30, and/or zero to 120 milliamperes. By being able to split the total range up in this manner one is always sure of getting a reasonable scale deflection.

This is very important when one is concerned with small and accurate readings, as it reduces any possibility of errors creeping in to a negligible extent.

The range changes are made in a most simple and effective way. One lead is plugged into a socket



With the AvoAdapter it is possible to make tests of valves very easily—and don't forget it is valves that are more often than not the cause of faults in wireless receivers

required. This procedure is not only quick but it does away with the use of any form of switching.

Let us consider the milliamperes scale first; suppose for a moment that your set has gone quite dead. The first thing to check up is the current supply, and to do this it is only necessary to connect the meter in the negative lead of the high tension.

For most sets it will be sufficient to plug in the 30-milliamperes scale, although if you have no idea of the current flowing it is always a wise policy to start off with the highest reading scale and reduce if necessary.

Preventing Harm to Meter

This prevents the meter being harmed by applying a greater current or voltage than that to which it is adjusted. Assume you know the normal current taken by your set is 10 milliamperes, but the meter now only shows 8. Plugging in the voltage section, we can check up the high-tension voltage. This we find is quite O.K.; therefore we know that something is not passing the current necessary for satisfactory operation.

The first thing one suspects is the valves, so it is best to satisfy ourselves in that direction. Remove these in turn from the set and test the filaments for continuity by applying the leads to the correct legs after plugging the negative lead into the socket marked ohms.

If you obtain no deflection you will know that the filament has gone or else the connecting wire in the valve legs has broken. The heater element in a mains valve can be tested in the same way. If these are all O.K. replace them in the set and test the anode current of each.

When doing this it is best to break the lead going to the anode at the terminal on the valve holder and connect the milliamperes range between this and the wire removed. The reading obtained will vary with the type of valve under test, but it is an easy matter to determine how much should be passing by consulting the maker's details and curves.

Characteristics

It is possible, if so desired, to check up the actual characteristics of any valve by applying the same values of high tension and grid bias as shown on the valve leaflets and noting the anode current flowing. This should correspond to the values shown by the anode current curve published by the makers.

To do this in a satisfactory manner it is advisable to utilise a separate valve holder fitted to a small base-board with a suitable variable resistance to vary the voltage applied to the grid of the valve. The makers of the AvoMinor have made an adaptor which can be used to carry out any valve tests.

It is well to note that the AvoMinor can be used to measure the current and voltage on a mains set or unit—that is, of course, after the rectifier in the case of A.C. sets. The AvoMinor is most certainly a wonderful little job, and without a doubt will uphold the prestige won by the Avometer.

L. O. S.

Crusaders'

A.V.C. 4

Specially Designed
by the
AMATEUR WIRELESS
Technical Staff

STOP! Drop everything and listen to this! The Crusaders' first set is here! Well, that's three exclamation marks right away. And we meant to start this all so calmly, too. Never mind, let's get along with the story—hoping you will forgive the opening outburst. Put it down to our natural excitement.

Not a Super-het!

Not a super-het? Incredible, we can hear you say. But you must believe us when we tell you that there are things about straight sets that are still undreamed of in the average constructor's philosophy.

The plain truth is that valves, as usual, are leading set designers along new paths. We must re-trace paths of technique many of us thought were never to be trodden again.

Who would have thought, a year ago, when super-hets were swamping the market, that a 1935 four-valver could possibly be "straight"? But that was before such valves as the double-diode-triode, the high-frequency pentode, and the push-pull pentode output types were produced for the battery set.

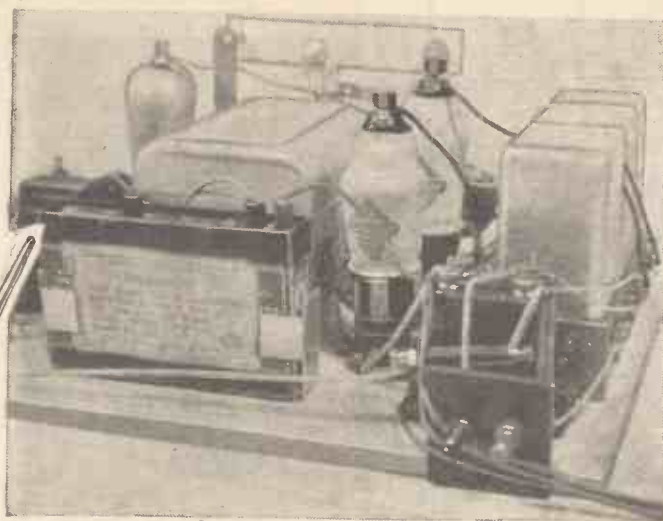
These new valve types provide the clue to the so-called "straightness" of the present set—of the Crusaders' A.V.C.4. It is straight only in so far as it is *not*—quite definitely *not*—a super-het.

Well, yes, it is straight in another sense—in the sense that there is a complete absence of frills. Yet, even so, we feel some qualification of the designation "straight" is needed because of the use of combination valves at every stage. What we mean is this: such a straight four as this could not possibly have been designed two or three years ago—simply because the special valve types did not then exist.

Straight Sequence

It is a straight set from the point of view of sequence: two high-frequency amplifying stages, detector, and power output. Four valves—but seven stages. You see, the detector is a three-in-one valve—a double-diode-triode; and the output valve is a two-in-one pentode—a QP21 valve.

Before we go into the details of the set, though, perhaps it



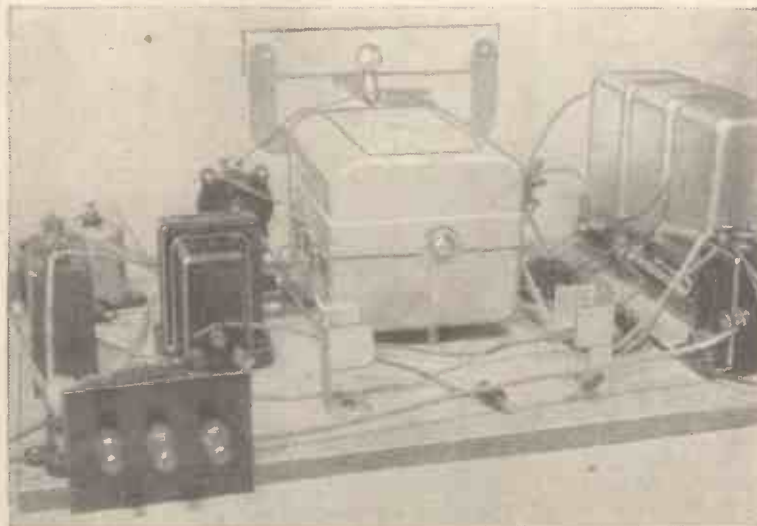
The Crusaders' A.V.C.4 is one of the first home-constructor's sets with a wavelength-calibrated dial. So easy for station finding!

is only right to say what it is expected to do. For a start, the Crusaders' A.V.C.4 is definitely designed to bring in foreign stations during daylight. It does this by virtue of the amplification that is obtained from the high-frequency pentode

valve. It is no stretching of the imagination for us to say that each of these pentodes is as good as two ordinary type high-frequency valves. The two together provide a stupendous degree of controlled high-frequency amplification.

These valves do more than give great amplification. They give all that with the very minimum of background noise. That is why, even when the set is tuned to the necessarily weak inputs of the daylight foreigners, good entertainment can readily be obtained. So just remember that very important point—good daylight range.

Secondly, we wanted to make the low-frequency side worthy of the high-frequency amplification—to give really ample volume



Everything is on the top of the baseboard, so the construction of the Crusaders' A.V.C.4 is extremely simple

Note These

Special Features . . .

⊙ Owing to the use of four of the latest valves, the Crusaders' A.V.C.4 is equivalent to a seven-valver.

⊙ There are two high-frequency stages, comprising two pentodes coupled by means of high-frequency transformers. An enormous reserve of power for daylight reception.

⊙ The double-diode-triode detector is equivalent to a separate triode and two separate diode valves.

⊙ The QP21 output valve comprises two pentode assemblies in one bulb. The output is 1,100 milliwatts.

⊙ In spite of the great output the high-tension consumption is only 12 milliamperes.

⊙ Full self-adjusting volume control is provided—and we have got over the ganging trouble thus introduced!

⊙ The tuning dial is calibrated in wavelengths for easy tuning.

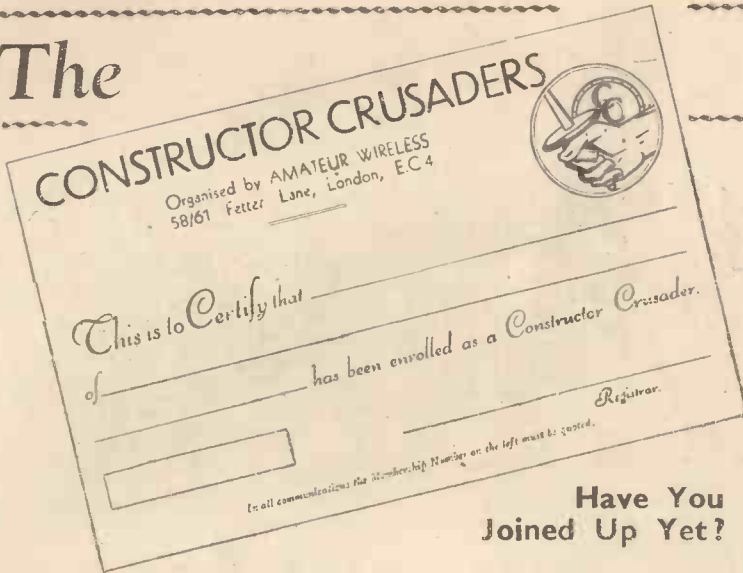
⊙ All the parts are mounted on top of the baseboard so that construction is particularly simple.

⊙ Provision has been made for straight pentode or class-B output if either of these is preferred to the QP21.

⊙ Every Constructor Crusader automatically gets a FREE full-size blueprint of the set immediately on enrolment!

The

Set for All Constructors



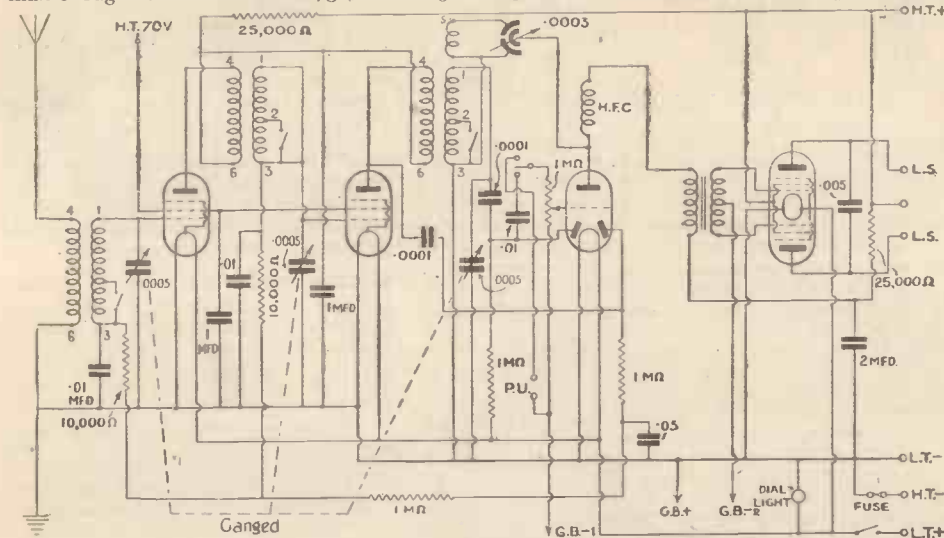
Have You Joined Up Yet?

output. We had to do this without vastly increasing the cost of running the set.

So we decided on quiescent-push-pull output, a system giving, with the 6P21 valve, an undistorted total output to hand on to the loud-speaker of 1,100 milliwatts—more than enough to fill to overflowing the average living room.

give fine results—with less circuit expense than ordinary screen-grids. What we mean is high-frequency transformers can be used instead of the familiar choke-fed tuned-grid circuit.

Moreover, in the interests of ganging efficiency it is definitely an advantage to use transformers.



Only four valves are used in the Crusaders' A.V.C.4, but they do the work of seven. Here is a circuit that pulls in the stations!

We realise, though, that this system is not the only one in popular demand; the rest of the set, beyond the detector, has therefore been designed and laid out in a very "open" way, so that you can take your choice of one of these systems—the other two will be given in due course.

Thirdly, and this really ends the actual stipulations we imposed upon ourselves in the design, we aimed to make the set up on a simple baseboard—rather than a chassis.

Not Playing to the Gallery!

No need to imagine that in adopting a baseboard layout we are playing to the gallery of radio fans—or that we fear contempt from the connoisseurs. For the truth of the matter is that a chassis, while invaluable to the set makers in a factory, is often a difficult proposition for the amateur in the home. Nor is a chassis necessary with every good modern home-constructor set. Just you take a look at our set in its finished form—you will be forced to agree that such a simple layout is much better on a plain baseboard than on a chassis involving an inevitable complication of the blueprint.

That's the whole point, of course. The blueprint. We want you—Crusaders all!—to be able to

make up this great new set as simply as possible. And you can if you use our FREE Crusader blueprint. It is the acme of simplicity.

In our final analysis of circuits and layouts we arrived at an arrangement giving all we were after—and a bit more for luck!—with a very minimum of components. We arrived at a circuit that, as already suggested, is in the straight category without being in any way "old game."

"Hot" valves from start to finish give the set a novelty that overrides all superficial novelties included in some sets just to catch the eye. Four valves, four bulbs, but seven stages of valve action.

We look upon the high-frequency pentodes as valves of great value in the continuance of the straight-set ideal. With the right sort of couplings these valves

One of the two diodes forms a half-wave detector. The triode then amplifies the resulting current. The second diode forms a self-adjusting volume control.

Just now, though, it might be said that there is always a certain bias applied to the high-frequency pentode. This is that these valves, if allowed to drop off badly in amplification. What would normally happen with a self-adjusting volume control circuit—back to nil, and the valves, just when amplification, would be running below par.

So, through a high-ratio transformer, the output stage actually incorporated the Crusaders' A.V.C.4. A 6P21 tube with two internally connected filament grids also internally connected to the contact.

A four-tube set, then, and a seven-stager!

There are some other points you ought to know about the circuit—just a few. For example, the aerial. It is fed into the first high-frequency pentode, as briefly mentioned already, through one of the high-frequency transformers, an arrangement, that is, of coils forming primary and secondary windings.

Reaction Application

Similarly, the high-frequency pentodes are coupled together, and so is the second pentode with the double-diode-triode. Reaction is applied to the secondary winding of the last transformer—reaction being fed back from the triode portion of this three-in-one valve. This is made possible by allowing a certain amount of high frequency to get through the diode half-wave detector to the triode low-frequency amplifier.

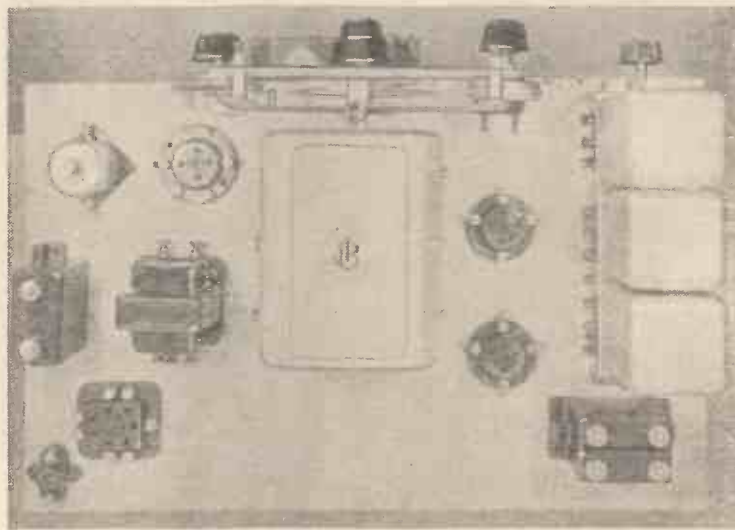
Incidentally, so far as we know, this is the first time the double-diode-triode type of valve has been used with reaction—and there is an advantage that nobody seems to have hit upon. We'll explain that later.

About the coils, or rather high-frequency transformers. The three of them are a gang, with internal switching for simplicity.

They are iron-core coils in these transformers, with small diameter formers, and a minimum of wire. The iron cores enable the wire amount to be cut down, of course, resulting in very good efficiency. The inductance conforms with the new coil standard—157 microhenries for medium waves and 2,200 microhenries for the long waves.

This is very important. For with the modern wavelength-calibrated tuning condenser scale accurate inductance makes all the difference between easy station finding and, well, chaos.

The tuning condenser is a well-known make of three-gang, with two trim-



This plan view of the Crusaders' A.V.C.4 before wiring is started shows its great simplicity

Constructor Crusaders!

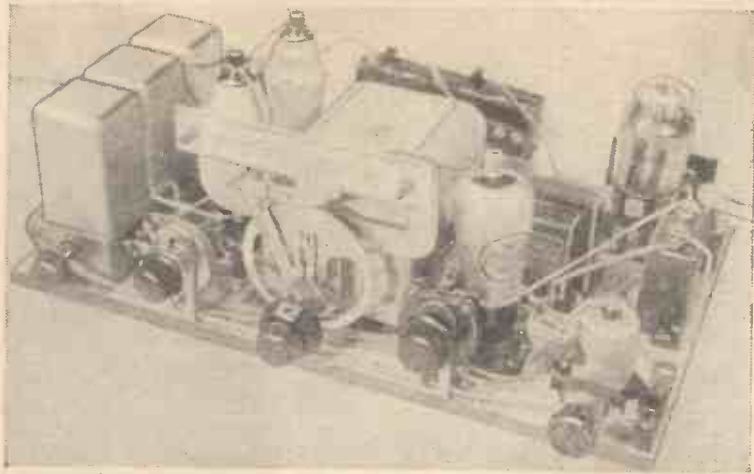
half-wave rectifier for the amplifies the very weak signal is used for the self-

well to explain that the arranged in such a way—actually 1.25 volts—cathodes. The reason for it to work without bias. Which, of course, is just a straightforward self-bias would be shot when needed for maximum low par.

former, we come to the in this first version of two-in-one pentode valve, filaments and auxiliary out brought out to one

mers on the side of the chassis and one important trimmer with concentric control on the main tuning knob. With this condenser the coils will tune from 200 to 550 metres on the medium waves and from 800 to 1,900 metres on the long, the scale marked in steps of 25 metres and 100 metres respectively.

Control has been kept simple enough for the novice, yet there is everything the critical expert would expect to find. That is to say, tuning is done mainly on the single-gang control knob, but the trimmer control enables the last ounce to be obtained by adjustment of the tuning of the detector grid coil. The two chassis trimmers are for the aerial and high-frequency-pentode circuit adjustments.

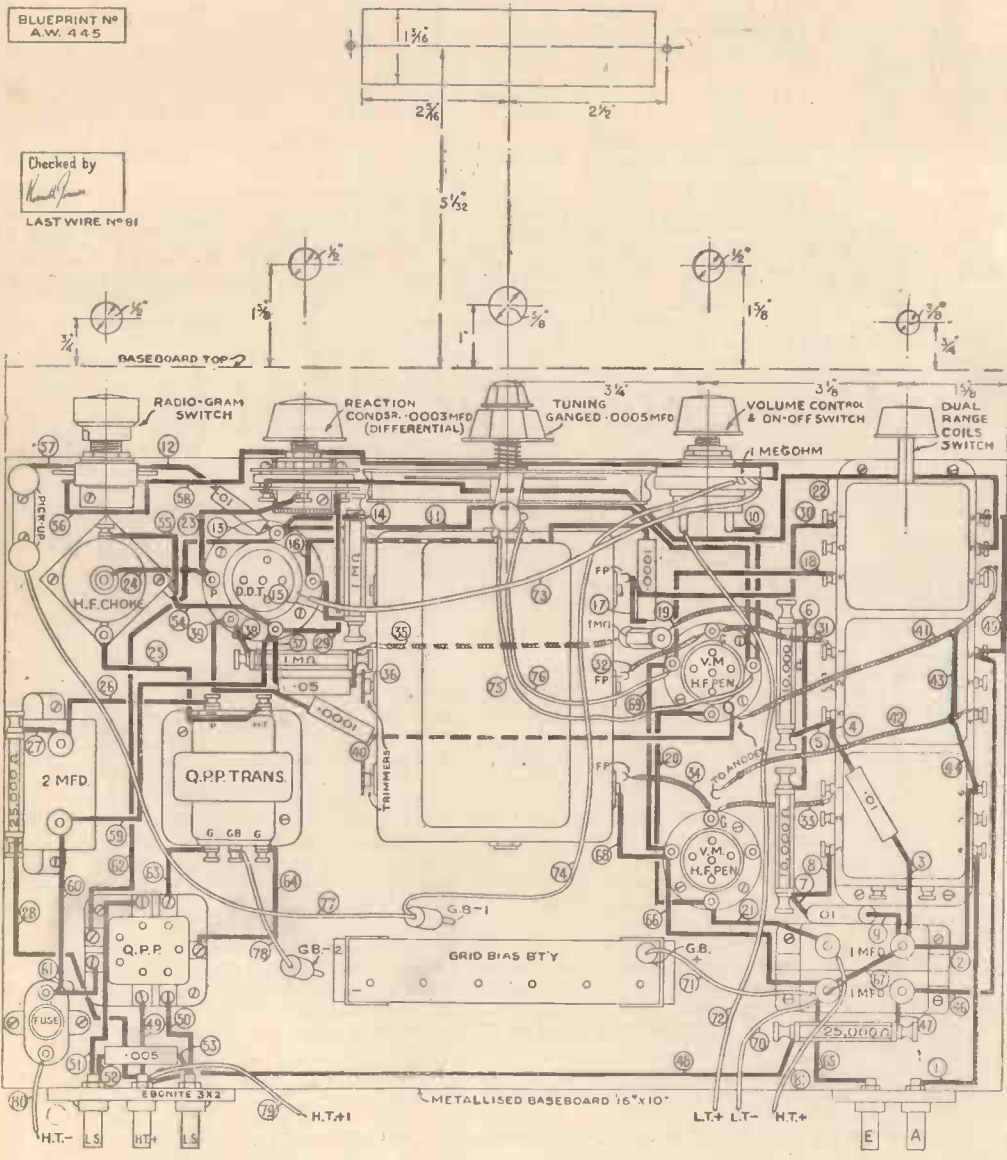


Another view of the front of the Crusaders' A.V.C.4, which gives full automatic volume control to prevent fading

Every Constructor Crusader Gets a FREE Full-size Blueprint of This Set—Fill in the Form on page 150

BLUEPRINT NO. A.W. 445

Checked by
LAST WIRE NO. 81



Apart from the tuning, there is a volume control on the left and a reaction control on the right. Quite an unusual volume control, too. It is a potentiometer giving a control of the input of the triode section of the double-diode-triode—acting at the same time as a grid leak. A variable one-megohm resistance, which, because it is in a circuit where there is no direct current makes no noise as it controls the volume. By the way, the volume control also includes the on-off switch.

Subtle Volume Control

This volume control's action is rather subtle. As the input is cut down, the amount of high-frequency getting through from the diode detector is also cut down, and so therefore is the possibility of obtaining reaction. This happens when the signals are very strong—when, therefore, reaction is not needed.

As soon as the volume is "pepped up" more high-frequency gets through to the triode portion; reaction is then obtained quite freely—just when it is wanted.

In practice this means, you see, that reaction is practically automatically applied when it is wanted; conversely, it is cut down when it is not. Almost needless to say, a differential type reaction condenser is used.

Full-vision Tuning

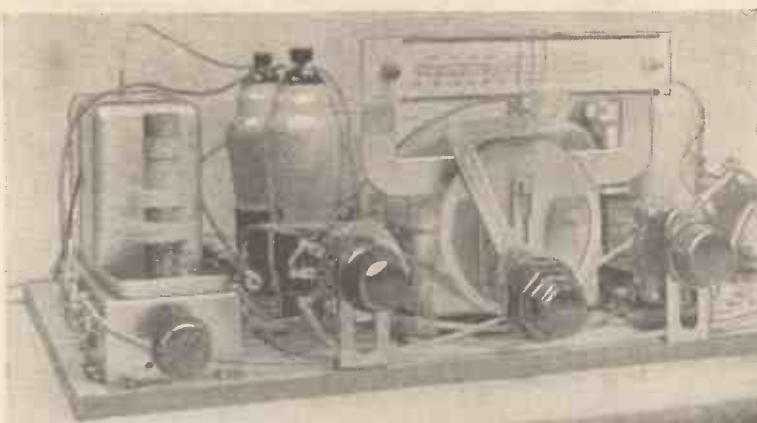
While on the subject of control, a word on the tuning dial. This is a full-vision affair, with a moving pointer over a scale you can read all the time—no fiddling aperture! The illuminating bulb is fixed so that it travels with the pointer, giving a really delightfully easy reading when you are logging those hundreds of stations.

It is a circuit without any frills. This, we say, in spite of the fundamental novelty of the valve stages. We have aimed at a minimum of components consistent with stability, and the standard of results required.

Perhaps a word on the output stage might be added. We have used one of the new W.B. loud-speakers with special-alloy magnet system. The Stentorian Senior it is named—quite appropriately, too. There is a built-in transformer for this job; with a neat switch to adjust the ratio to suit the valve in use.

Lastly, in this week's notes, a reminder that the set is just a plain

A full-size blueprint can be obtained for 1s. 6d., post paid, on application to the "Amateur Wireless" Blueprint Dept.; ask for No. AW445. This reproduction is at one-third scale. It shows the layout of all the components and the full details of the wiring connections



Here is the Crusaders' A.V.C.4 completely wired and all ready for use. It is a real winner, as our exhaustive tests have proved

baseboard job—which any ordinary reader can tackle with the utmost confidence. The variable condenser is mounted on its own feet on the baseboard, likewise the three-coil unit is easily screwed into position. Then there are the little brackets for the volume and reaction controls. The coil switch control is on the coil chassis and, of course, the tuning condenser control is self-mounted.

On the baseboard are two four-pin valve holders, one five-pin, and one seven-pin, the last named for the output valve. All the smaller condensers are of the new tubular type wired up with the connections to the other components.



Next week we will elaborate the construction details, and perhaps we shall have room, too, to tell you more about the operation. Meanwhile, you just chew over what we have told you—take a good look at the pictures and, if you can understand it, analyse the theory diagram at your leisure. It is a good circuit—straight but novel.

PARTS NEEDED FOR THE CRUSADERS' A.V.C.4

BASEBOARD

- 1—Peto Scott Metaplex, 16 in. by 10 in.
- CHOKE, HIGH-FREQUENCY**
- 1—Varley screened, type B P26 (or Telsen, Lissen).

COILS

- 1—Telsen triple unit, type W477.

CONDENSERS, FIXED

- 7—T.C.C. tubular type, values : .0001- (2), .005-, .01- (3), .05-microfarad (or Dubilier, T.M.C.).
- 3—Graham Farish 1- (2), 2-microfarad (or T.M.C. Lissen).

CONDENSERS, VARIABLE

- 1—J.B. three-gang .0005-microfarad with slow-motion drive, type Linatune.
- 1—Bulgin, .0003-microfarad differential.

HOLDER, FUSE

- 1—Bulgin, type F5, with fuse bulb.

HOLDERS, VALVE

- *4—Graham Farish, 4-pin (2), 5-pin, and 7-pin (or W.B., Telsen).

PLUGS, ETC.

- 5—Clix plugs and sockets: marked aerial, Earth, H.T., L.S. (2)
- 6—Clix wander plugs: marked H.T.+, H.T.+1, H.T.—, G.B.+, G.B.—1, G.B.—2.
- 2—Clix spade terminals, marked L.T.+, L.T.—.

RESISTANCES, FIXED

- 7—Graham Farish 1½-watt, values : 10,000- (2), 25,000-ohm (2), 1-megohm (3) (or Telsen, Dubilier).

RESISTANCE, VARIABLE

- 1—Ferranti 1-megohm with on-off switch.

SUNDRIES

- 2—Ebonite strips, 3 in. by 2 in. and 2 in. by 2 in. Connecting wire and sleeving.
- 3 yards of thin flex for battery leads.
- 1—Bulgin 2.5-volt dial lamp.
- 3—Peto Scott metal-mounting brackets, 2½ in. (2) and 1 in.
- 6 ft. screened sleeving.
- 1—Telsen pick-up terminal block.
- 1—Bulgin S82 switch.

TRANSFORMER, LOW-FREQUENCY

- *1—Lissen Hypernik, type QPP (or Ferranti, Wearite).

ACCESSORIES

BATTERIES

- 2—Lissen 60-volt high-tension, type LN233.
- 1—Lissen 9-volt grid-bias, type LN180.
- 1—Exide 2-volt accumulator.

CABINETS

- 1—Peto Scott table type for set.
- 1—Peto Scott for loud-speaker.

LOUD-SPEAKER

- 1—W.B. Stentorian Senior.

VALVES

- 2—Cossor 210VPT.
- 1—Ferranti H2D.
- *1—Marconi QP21.

* PARTS FOR ALTERNATIVE OUTPUT STAGES

PENTODE VERSION

- 2—Graham Farish 1-microfarad condensers.
- 4—Graham Farish valveholders, 4-pin (2) and 5-pin (2).
- 3—Graham Farish 1½ watt resistances, 800, 5,000, and 15,000 ohms.
- 1—Varley Micro 1 low-frequency transformer.
- 1—Mullard PM22C pentode.

CLASS-B VERSION

- 4—Graham Farish valveholders, 4-pin (2), 5-pin, and 7-pin.
 - 1—Ferranti class-B transformer.
 - 1—Ferranti HP2 valve.
- (Complete kit of parts for this set can be obtained from the Peto-Scott Co., Ltd.)

Radio and a Changing World

WHAT influence will radio have in moulding the world of the future? Will it have any considerable influence at all? Most people, emphatically answering, "Of course it will!" to the second question, will probably consider that a question likely to bring forth such a unanimous answer is scarcely worth asking.

That radio has already had a considerable influence on most of us is beyond question. Millions of people now listen joyfully to music which ten years ago they would have described as "nasty noises." We enjoy and discuss talks which, given to us in the early days of broadcasting, would have sent us to bed.

Influence of Broadcasting

Because broadcasting has influenced us in the past, and is influencing us in the present, there is a great tendency for us to assume that is must necessarily continue to influence people in the future.

Few of us would deny that our introduction to many of the wireless features which we enjoy to-day was not a painless process. The broadcasting authorities did their best to lead us on gently to the joys which lay ahead. But to listen to a talk on something of real importance, even though the subject was attractively presented, needed a distinct mental effort from those of us whose main concern in public affairs was the position of Chelsea in the Football League tables.

However, we made the effort. In the absence of alternative programmes from home or abroad, our only method of avoiding the talks and music which were offered to us was to switch off the set.

And we didn't want to do that, for the novelty of having sounds thus conveyed to us from miles away atoned for any apparent lack of inherent interest in the sounds themselves.

And, having thus been cozened into listening to something which we didn't want to hear, we found that our fears of being permanently bored by that sort of thing were groundless. It was only the first step that was painful. A little initial patience, we learnt, often led to immense pleasure, compared with which the discomfort of taking that first step was infinitesimal.

Neither Beethoven nor Hot Jazz would have become as popular as they are to-day if those early alternative-less wireless programmes had not shown us the soundness of the policy of listening to things which, at first hearing, seem unattractive.

Having learnt our lesson, we have, consciously or subconsciously, remembered it. If an item in the programmes threatens to jar our serenity because it strikes out on lines that are new to us, we do not always change over to one of the many alternative programmes of a more familiar type which are now available to us. For we have our past experience to suggest to us that we might thus miss something capable of leading us on to new pleasures.

That is why radio to-day, despite the large choice of programmes, still has an immense influence on the thoughts and ideas of the world.

But this influence will continue only so long as individual listeners give it the chance to do so. Listeners are obviously not influenced by programmes to which they do not listen.

The listener of to-morrow, not having been forced, as people of to-day have been, to learn from experience the wisdom of giving a hearing to something new which at first fails to attract, may slip back into the unenterprising state of listening only to what he knows he likes.

The most ambitious efforts of broadcasting authorities to point to the most desirable and pleasurable paths for the world to follow will be unavailing if listeners choose to listen to something from another station. Every station is almost bound to have its lighter moments, so there will always be something available for the listener who prefers to avoid exploring new ideas.

Listeners Must Help!

If radio is to continue to guide the world in a desirable direction, listeners of to-day must help it to do so. Experience has taught us the desirability of giving a hearing to new ideas; we know that this is a policy which, in the long run, makes life more worth living. But our children will not have our experience to guide them. Only our advice and example can teach them the knowledge which circumstances have taught us.

As our years advance, we must guard against the natural tendency to drop a good habit which we acquired in our youthful days. Our advice, if we fail to follow it wholeheartedly ourselves, will have little authority.

It is dangerous to consider that a continuance of the powerful influence of radio in helping the world to make necessary changes is inevitable. For, actually, it is inevitable only if we recognise that our help is necessary to make it so.

R. A. S.



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3 Graham Farish fixed condensers—1(2), 2 mfd.	7 0
1 J.B. Linatune 3-gang condenser .0005 mfd. with S/M drive	1 7 6
1 Graham Farish .0005 mfd. differential condenser	2 0
1 pair Bulgin G.B. Clips	6 6
1 Bulgin SPDT, type S103	1 6
1 Bulgin type F.5 fuse holder complete with fuses	1 0
4 Graham Farish valve holders (2) 4-pin (1) 5-pin, (1) 7-pin	2 11
5 Clix marked plugs and sockets	1 10 3
5 Clix marked wander plugs	7 3
2 Clix marked wander terminals	4
7 Graham Farish fixed resistances, 1 1/2 watt—10,000 (2), 25,000 ohms (2), 1 megohm (3)	10 6
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All About the New Sets



Eight-sided cabinet ensures a distinctive place at Radiolympia for this imposing-looking Burndept receiver

FURNITURE minded—that is the development epitomising the radio set makers' attitude at this year's Radiolympia. Sets themselves, though abounding in detailed and often unsuspected improvements, are not fundamentally different from last year. In fact, taken as a complete range, they show remarkable similarity of main design.

Two Groups

We can trace two main groups. First, and most popular, is the five-valve super-het, which consists of four receiving valves and a mains rectifying valve. Secondly, is the seven-valve super-het, with six receiving valves and rectifier.

Apart from these two main categories, which include the big majority of all the sets at the show, there are, of course, some specialised circuits, as exemplified in the three-valve super-het and the six-valve super-het.

Then, again, some makers have realised that with the keen competition of to-day value for money can be emphasised by the production of sets that do more than just receive ordinary broadcasting—in other words, sets for all waves.

Even though the short waves admittedly do not give entertainment in the same reliable way as medium and long waves, the modern all-waver with five or seven valves in a super-het circuit can very easily bring in trans-Atlantic programmes with great ease of operation.

Choice of Sets

From this point of view it is obvious that of two sets, one giving the short waves and the other ignoring them, the keen buyer will tend to choose the former—even when not specially interested in short-wave reception.

For the first time there will be quite a number of radio-gramophones covering on the radio side all-wave tuning ranges.

Talking of radio-gramophones, the main point of interest over last



Daring breakaway in cabinet design—Ekco circular bakelite model five-valver for universal mains working

year is the reduction in price—combination instruments can now be obtained for as little as 17 guineas, giving first-class results.

Although there are fewer automatic record-changers this year on radio-gramophones, you must not jump to the conclusion that the idea is proved a failure. Rather, it has settled down to two distinct types.

The one type is that adopted by the Hayes group—absolutely automatic, being set in operation simply by pressing a mercury switch, playing twelve records of either 10 or 12-in. records.

The idea of the mercury switch is to make sure that there is no interference with the radio section caused by arcing at the contacts. Then the second type—the Garrard—has three pillars, which, when turned one way play 10-in. records, and when turned the other way 12-in. records. This requires two knobs only to play the records automatically. There are other types of changers, but they are really specialised ideas not widely adopted.

As yet the American idea of playing both sides of the record has not really caught on—

though there is one instrument, the Autotrope, that will play 30 records on both sides—sixty tunes without any bother of changing the records!

Where are the straight sets of yesteryear? Plenty in evidence at the Show! Good quality and absence of background noise will always tend to keep the straight type of circuit in considerable usage.

This year manufacturers have augmented



Brand-new addition to the extensive Marconi range. A.C. automatic radio-gramophone. Includes de-luxe refinements, such as S.A.V.C., visual tuning and very useful static suppressor



Yankee radio "ops" call in at Cannes—and stay, no doubt, to sample the delights of an H.M.V. super-het battery portable. The girl isn't missing much, either!

their super-het ranges by the designing of some really wonderful straight sets, which quite frequently give better overall performance than the small super-hets. By which we think you can prove the point that a well-designed straight set is superior in quality and sensitivity to the very small supers, which set out more with the idea of ensuring first-class selectivity.

These new straight sets can be sub-divided into three groups. The straight three with one high-frequency stage, detector and output—generally using a high-frequency pentode in the first stage; the four-valve straight set, fundamentally the same as the three-valver, with the addition of a bigger power output stage, with class-B or Q.P.P. systems; and, thirdly, the long-distance man's straight set, with either two or

Continued on page 174

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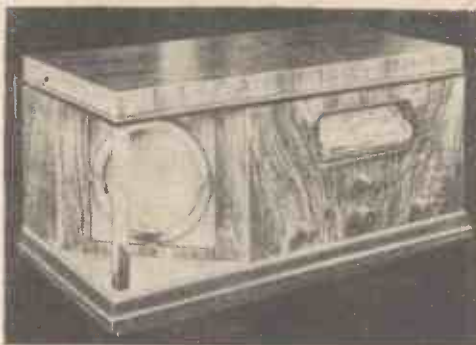
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All About the New Sets—Continued from page 172



Atlas scrap old models and concentrate on 7-5-8 super-het, seen here in original table cabinet. Seven tuned circuits and five valves

three high-frequency stages, detector and power output.

It seems that the two high-frequency stage set will finally prove the more popular of the straight sets, because it is inherently more stable than sets with three high-frequency stages, and as it will have a band-pass input the set coming into favour will be very little less selective than three high-frequency stage sets without bandpass. Of course, bandpass is ruled out with more than two stages—as the ganging of the multiple condenser would be too complicated.

Superior in Daylight

Incidentally, the straight set with two high-frequency stages is superior in daylight to the super-het. In fact, when you want to go in for really long-distance work, the straight set has the further advantage that the noise level or background is appreciably lower. This does not in any way detract from the decided reduction of noise that has been effected in modern super-hets, which for all ordinary listeners do undoubtedly offer a highly satisfactory number of stations really clear of interference.

We come now to a very specialised type of set—the car radio. This year, instead of being just simply a set fixed in the car, it has been so arranged that extension loud-speakers can be fitted, enabling it to be used, if necessary, as an ordinary family set. To this end the set can be readily removed from the car and taken indoors.

As the modern car radio gives a performance equal to the ordinary mains set, even when run indirectly from accumulators, they are being taken up in country districts where there is no electric-light supply, but where really good performance is wanted, especially in terms of volume output.

For Yachtsmen

For the first time you will see sets designed solely for use in small yachts. These sets are of varying types, one being a simple two-valver with headphones—for receiving weather news and so on. Another has two high-frequency stages and class-B output, running from a

vibrator converter like a battery-operated car radio. Yet another yacht set uses a super-het circuit, being complete with simple transmitter having a limited, though useful, range.

Some Outstanding Examples

In this short review it is, of course, impossible to do full justice to all the excellent sets at Radiolympia. For now we must be content to touch upon some of the outstanding examples that illustrate modern developments and trends in technical design.

One of the instruments in the H.M.V. (Stand Nos. 33 and 61) range that ought to attract a good deal of attention at Radiolympia is a nine-valve radio gramophone with automatic record changer. The price is only 48 guineas—remarkable value when one remembers the cost of such affairs even a year or so ago.

This particular model, H.M.V. 580, is called the Duo-Diffusion Auto-radiogram Nine. Its special feature is a duo-cone loud-speaker of paper and metal construction.

Going to the other extreme in this range is the new Long Three—a horizontal cabinet battery operated three, costing only £7 19s. 6d.

Perhaps the biggest bargain in the whole of this range, though, is the Concert Seven, a super-het at 17 guineas—available for A.C. or D.C. mains, the D.C. model giving the exceptional output of 3 watts.

Model 570 is an automatic radio gramophone with the latest H.M.V. feature of fluid-light tuning. It is priced at 33 guineas and ought to have a very popular appeal.

Specialised cabinet design is the feature of the new Atlas (Stand No. 85) receiver, available in table or console form. In the table cabinet a striking departure from the normal run of designs has been achieved by placing the loud-speaker fret section

at an angle of 45 degrees with respect to the rest of the front. Chromium-plated fittings—just enough and not too many—contrast strikingly with the very excellent woodwork of the rest of the set.

Then there is the special Atlas dial. In brief, it is a swivelling or tilting dial, adjustable to suit the eye level of the individual listener and operator. Stations' names—49 of them—are marked on this dial, but they are not



McMickael Twin Supervox—one of the first of the twin loud-speaker sets

visible when the set is switched off. As soon as the medium waves come into action the stations are illuminated in green, but on long waves the appropriate stations come out in red.

Short-wave listeners have been admirably catered for. The Stratton Super-Six (Stand No. 30) is a set many listeners have been waiting for. It is a six-valve super-het with tuning ranges between 13 and 70 metres and between

250 and 540 metres. Self-contained with moving-coil loud-speaker in a hard teak cabinet, suitable for use overseas. It is, of course, a mains-driven set.

While talking of Stratton's, we must mention the All-wave Four, supplied in an insect-proof cabinet, also as useful to overseas listeners as it undoubtedly is for home listeners.

Another firm doing very well for the short-wave fan this year is Peto Scott (not at the Show), an old-established firm now making three sets suitable for home or colonial use on short waves.

The Battery Four tunes from 12 to 550 metres, and uses a high-frequency pentode with two low-frequency stages and single-dial control. The special point about this set is that when enclosed in the cabinet the set can be adjusted for the different ranges by coils plugged into the front.

All-wave Set with Universal Valves

Another Peto Scott set is a four-valve all-wave set for A.C.-D.C. mains operation, using the new Osram 13-volt universal mains valves—the first short-waver to do so.

An interesting unit is a two-stage A.C.-D.C. short-wave converter, which can be used in front of any battery or any mains receiver having at least one high-frequency stage in its circuit.

This Peto Scott set tunes down to the low wavelength of 11 metres and should be very useful to broadcast listeners wanting a good short-wave unit for conversion.

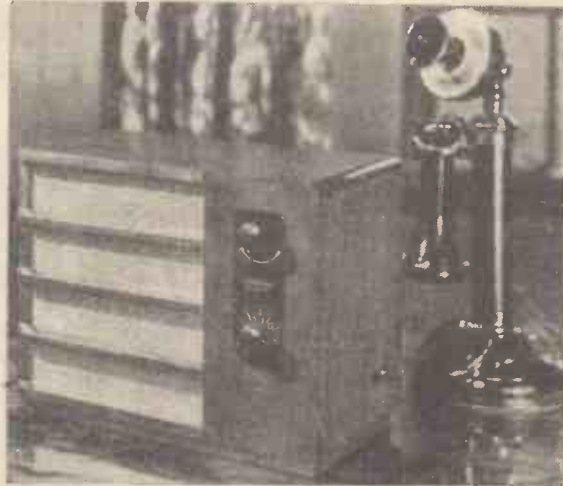
Continued on page 176



Super-het AVC5 by G.E.C., with 3 watts power handled by large-size energised moving-coil loud-speaker



Its lid protects the controls from dust—one feature of the modernistic Pye super-het



Really midget—the latest universal mains set from the Sunbeam factory. It works well!

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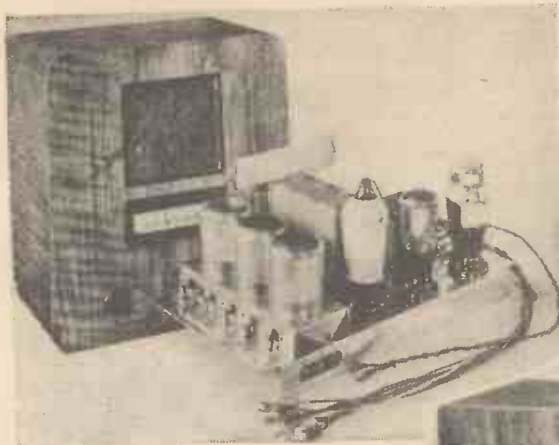
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All About the New Sets—Continued from page 174



Lissen Skyscraper kit as it looks when made up in neat metal chassis. The good-looking cabinet behind completes that professional touch

In another well-known range—the G.E.C. Overseas Seven (Stand Nos. 34 and 66) must be mentioned as being a really good short-waver that also tunes on the medium waveband. This set is designed for tropical use, gives 3 watts output, and has complete self-adjusting volume control.

Another good set in the G.E.C. range is the Battery Compact Three. A three-valve set, complete with moving-coil loud-speaker, selling at the very low price of £5 17s. 6d. Then there is the new A.C.-D.C. mains three, which, with an energised built-in loud-speaker gives a minimum of 2 watts output on either supply.

High Spot of the Range

Probably the high spot of the G.E.C. range is the new A.V.C. Five radio gramophone. Selling at only 22 guineas, this instrument gives 3 watts output, delayed and amplified self-adjusting volume control, and has all controls, except manual volume, mounted on the motor deck out of sight when the lid is closed.

Chief among the attractive sets produced this year by Ferranti (Stand No. 70) must be mentioned the Lancastria, an A.C. mains consolette at 12 guineas. Although only using four receiving valves there are many more stages of action. For these valves consist of a heptode, a high-frequency pentode and a low-frequency pentode, and a three-in-one detector.

Barreter Tube

A patented circuit is used with a barreter resistance, arranged to adjust the set automatically to the supply voltage. There are, therefore, no mains input tappings to worry over.

All Ferranti sets, we hear, are tested for six hours continuously on ordinary working conditions, after all the usual factory tests have been applied. This is claimed to ensure that every set leaving the factory has proved its worth in practice.

Cabinet design is again a high light in the Burndept (Stand No. 81) sets—the Etherdyne five-valve super-het for A.C. mains. What is referred to as “matched and balanced reciprocal

propagation of sound” is the technical feature that will attract some attention.

Two loud-speakers are arranged on the front at a critical angle, not only to give balanced quality, but to eliminate sound shadows or blind spots and inequalities in the sound propagation.

Model 203 in the Burndept range is a universal radio gram-

and, of course, an energised moving coil. For an A.C. mains set the price is remarkable—being only 12 guineas.

Attractive Bakelite Cabinets

Bakelite cabinets are now standardised among the Ekco (Stand No. 72) set range—which includes a very daring departure from the usual cabinet design. Nothing less than a circular bakelite moulded cabinet, with the tuning dial arranged round the outside of the moving-coil loud-speaker fret. This is arranged to rest on a neat stand. The cabinet can be obtained in either walnut finish or in black.

Two A.C./D.C. sets are in the Ekco range this year. Model AD65 is a six-stage set, and AD95 with nine stages. Full delayed automatic volume control, and a special pre-selector noise suppressor are features. The idea is



Good family set by Cossor—the model 350 battery three-valver, with built-in moving-iron loud-speaker

phone using a six-valve super-het circuit, suitable for either A.C. or D.C. mains at will. This instrument is complete with universal electric gramophone motor, automatic stop-and-start mechanism and other refinements—all for 32 guineas.

For constructors the Cossor range (Stand No. 73) is again notable

with its famous Melody Maker kit set. This year the kit consists of a three-valve circuit with variable-mu screen-grid stage, costing £5 19s. for the kit. It can also be obtained for mains operation, the price then being £7 19s. A feature of both models is the use of moving-coil

that the amplification of the set can be adjusted to receive only a select number of stations—that is stations above a certain field strength, thus ensuring that all those so received are worth hearing.

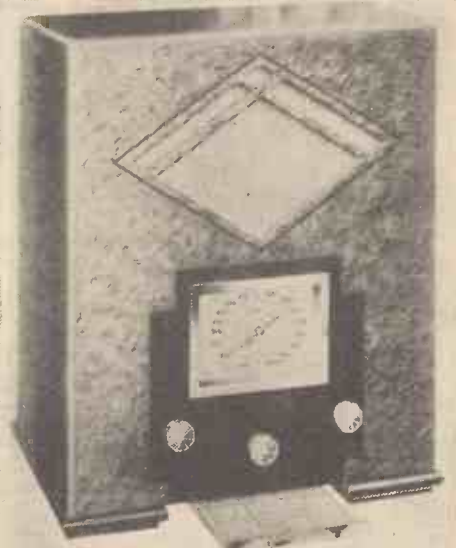
In the vast Marconiphone (Stand 76) range of sets it is difficult to pick out only one or two as being typical, for the sets range from a simple three-valve battery receiver to a nine-valve automatic radio gramophone.

Perhaps one of the most interesting is the five-valve super-het auto-radiogram—model 288 at 27 guineas. Without a changer it is only 20 guineas. The six-valve battery portable, model 269, is a super-het with A.V.C., bringing in almost as many stations as the average super-het with external aerial.

Special A.V.C.

On the model 292 there is an adjustable self-adjusting volume control circuit—the point being that when the station is below a certain strength the circuit is inoperative and therefore does not cut down signal strength.

Another very good range of sets that must be mentioned in this briefest of reviews is the Telsen (Stand Nos. 75 and 101). The six-valve super-het in this range includes full self-adjusting volume control, seven tuned circuits, and no fewer than



Clock-face tuning—sign of the times!—is a big feature of Ultra model 22 four-valve super-het, which uses a double-diode-pentode valve

loud-speakers.

Amongst the new Cossor sets for the ordinary listener is the model 535, which is a super-het with five valves, including neon tuning indicator, diode detection, automatic volume control, tone control,

(Cont. on page 192)



New battery six-valve super-het by the well-known Kolster Brandes group. Like the delicate cabinet figuring?

The **SENSITY**

COIL



SENSITY IRON-CORED COILS

Represent the greatest advance in scientific coil design in recent years. Comprehensive tests in all parts of the United Kingdom, under widely varying conditions, indicate their enormous possibilities.

The air-cored Litzendraht winding is disposed on a bobbin moulded of an entirely new material and is mounted on a white Steatite base having negligible H.F. losses.

The screening can, finished in dreadnought grey, adds just that touch of distinction to an already distinguished design.

Aerial Coil Type T.1 without Reaction ... 5/-
 Aerial Coil Type A. 1 with Reaction ... 5/-
 H.F. Coil Type P.P. ... 5/- **5/-**



FORMO SCREENED PAPER CONDENSER

An entirely new and up to the minute Tubular condenser design, supplied in the following capacities:

.1 mfd.	1/6
.25 "	1/6
.5 "	1/6
1 "	1/9
2 "	2/-
3 "	3/-

Test voltage 750v. D.C.
 Working voltage 375v. D.C. **1/6**



TWO-GANG CONDENSER
 Type DU5.

Extremely robust construction. Finished in dreadnought grey and supplied complete with Chrome and Bakelite full vision floodlit drive. Price 11/-

11/- Dust Cover 1/6 extra

For twelve years Formo leadership in the Component field has been a recognised fact. Details of the new 1935 Formo range will confirm that such leadership has been adequately maintained. Make a point of seeing the Formo Stand at Radiolympia. New ideas for the home constructor—new Components, practical and inexpensive, make it a Mecca of interest for every radio owner.

RADIOLYMPIA STAND 59

MAIN HALL

Stand 59 will show you exactly how far Formo Radio Components have advanced ahead of all others in design and purpose.

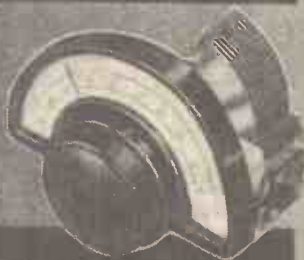


FORMO-DENSOR

The Formo-densor is eminently suitable for use as a Neutralising condenser, Aerial condenser, Grid condenser, Reaction condenser, and Tone Control condenser.

Available in the following capacities:—

	Max.	Min.	
F	0001 to 00005	1/6	1/6
J	0001 to 00025	1/6	
G	001 to 002	1/6	
H	002 to 001	2/3	



SINGLE UNIT TUNING CONDENSER
 Type SU5.

A really substantial Slow Motion Condenser supplied complete with full vision Mystic Drive requiring no special panel cut-out. Extraordinarily low losses and consequent sharpness of tuning. Dreadnought grey finish. The full vision floodlit scale of the Mystic Drive is engraved in dual colours.

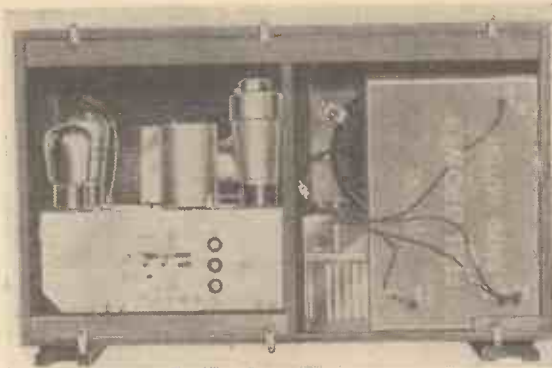
0005 mfd. Capacity with Mystic Drive **6/6**

Formo Products, Ltd.,
 Masons Hill, Bromley,
 KENT.

Telephone:
 Ravensbourne 3379.



To Ensure Speedy Delivery Mention "A.W." to Advertisers



The new Mullard MB3 receiver incorporates a combined high-tension and grid-bias battery in its horizontal cabinet

IT was with considerable interest that we put the first Mullard receiver through its paces. Although this company has from time to time sponsored the design of kit receivers, it has kept entirely clear of completed receivers.

The MB3 is the first of what we hope will be a number of Mullard receivers. Entirely different from the usual run of inexpensive three-valvers, it uses three pentode valves, which perhaps accounts for the exceptional results we obtained.

Horizontal Cabinet

The cabinet is unusually severe but attractive, and we certainly like the idea of having a loud-speaker alongside the receiver. The non-technical user will appreciate the fact that there are only two controls—on the left-hand side a combined on-off switch and volume control and on the right-hand side a combined wave-change switch and master tuner.

These controls require a little explanation. The volume control is a potentiometer with an internal switch. When it is turned in a clockwise direction the receiver is automatically switched on and the volume is increased to maximum.

Coupled with the tuner is a multi-point switch for wave-changing. When the control is pulled out, the receiver tunes in the long-wave stations between 850 and 2,000 metres., and when pushed in medium-wave stations are heard between 200 and 600 metres.

Most readers will be interested in the tuning dial. It is calibrated in half degrees so that stations can be logged very accurately, while the slow-motion drive which actuates the indicating pointer is geared down very considerably.

The circuit is comparatively straightforward. It uses three pentodes; a variable-mu high-frequency pentode as an amplifier, a straight high-frequency pentode as a detector, and a low-frequency pentode in the output stage.

No Reaction Needed

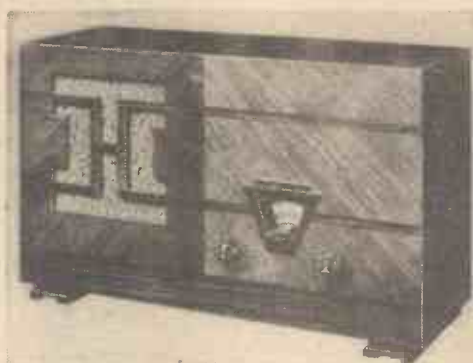
Owing to the extreme sensitivity of the high-frequency stage, no reaction is incorporated, which helps to reduce the number of controls and to simplify the operation. The detector valve, as it is a high-frequency pentode, is resistance-capacity coupled to the output pentode so that the quality is distinctly better than when a transformer is used.

A complete high-frequency filtering circuit is included between the detector and output valves, preventing any possibility of overloading in the output circuit.

We found that the sensitivity and selectivity were distinctly above the average, and when we examined the receiver chassis the reason was immediately obvious. Both the tuning coils are Litz wound on very special highly-insulated formers. Due to the design of the coil, the maximum stage gain is obtained from

the high-frequency pentode, which probably accounts for the fact that some twenty stations were received in broad daylight.

There are two tuning circuits controlled by a double-gang condenser, which is effectively balanced, preventing humped tuning. An alternative aerial tapping is provided should it be necessary to increase the selectivity when very close to a local station.



For accurate tuning the scale is calibrated in half-degrees. Although only three valves are used, there is no reaction

The output pentode has been very carefully matched to a sensitive permanent-magnet loud-speaker, and even though it is totally enclosed there is an entire absence of box resonance. This is probably due to the resistance-capacity coupling and the output pentode boosting the top notes.

We decided to check up on the current consumption to see whether or not the quality was obtained at the expense of anode and filament current. We were pleased to find that the low-tension consumption was only .56 ampere at 2 volts, while the drain from the high-tension battery was a little under 9 milliamperes.

A point we thought rather sound was that all of the battery leads were carefully marked A-plus and A-negative, for example, so that it was quite obvious the leads had to be connected to low-tension positive and negative. The American system of battery designation has been used, A standing for low tension, B for high tension, and C for grid bias.

Mullard Battery 3

We discovered the most efficient aerial was one having a total length of between 60 and 70 ft., and when the receiver was used at a distance of 30 miles from the local station only four channels were lost on either side.

Increasing Selectivity

By foregoing a few of the weaker stations, the selectivity could be further increased by using the aerial tapping, when selectivity was adequate for all normal requirements. It was very pleasant not to have to worry about a reaction control, for with the volume control set somewhere near the maximum position between thirty and forty stations could always be received without difficulty.

Actually the receiver is more or less a one-knob set for, by leaving the volume control set, plenty of alternative programmes were received on the medium waves. On the long waves, brought into circuit by pulling out

IN A NUTSHELL

Makers' Name : Mullard Wireless Service Co., Ltd.

Model : MB3.

Price : £8 8s.

Valve Specification : Variable-mu high-frequency amplifier with steep-slope pentode (Mullard VP2); high-frequency pentode detector (Mullard SP2) coupled to a low-consumption pentode (Mullard PM22A).

Type : Horizontal self-contained table model.

Power Supply : Internal combined high-tension and grid-bias battery and low-tension accumulator.

Remarks : This is the first complete receiver to be marketed by the Mullard Company and a very good set it is.

the tuning knob, the selectivity was sufficiently good for us to receive Eiffel Tower, Daventry, and Radio Paris entirely clear of interference.

With a little care, Luxembourg and Kalundborg were picked up free from mutual interference on Sunday morning, which is more than many super-hets can do.

We really feel that the first Mullard set will be the centre of interest on the Mullard stand at Radiolympia. It is a factory-built set at a kit price, and shows that Mullards, with their experience of the set-making trade, do realise just what the listener requires.

Amateur Transmitting in 1911

RADIO 2KT, who is to-day still being consistently heard, was originally on the air with a power of up to 1 kilowatt as far back as 1911.

This station, operated by J. E. Nickless, A.M.I.E.E., is well known to English listeners for its broadcasts on the 80- and 160-metre bands, which are picked up all over the country.

On the lower bands, 2KT has been heard in all parts of the world and is now as well known in India, for example, as in this country. The Indian station VU2FY is almost identical in construction as 2KT and both stations are in daily contact.

With improved design, coupled with many years experience, 2KT has discovered that 1 kilowatt output is no longer required as the

whole world, with very few exceptions, can be covered on 10 watts—the power now used.

The station is crystal controlled and can work on 160, 80, 40, 20, 10 and 5 metres, although the most used frequencies are 1,762, 3,583, and 7,151 kilocycles.

An inverted L aerial is used with counterpoise for the 160-metre band, but on the other wavelengths a "sausage" with a 66-ft. top and 40-ft. feeders is used.

The crystal oscillator has three main crystals that can be switched into circuit without alteration to the rest of the apparatus. Heising modulation is used, which accounts for the excellent volume and quality which is always commented upon in listeners' reports.

**“Yes, I’m fully charged
Look at my indicator”**



I am the Exide “Indicator” Battery. When I say “Full” I *am* full—and that’s that. When my hand approaches “Empty” it is time to get me recharged—and that’s *that*. The point is that with me you always know where you stand. I put an end to uncertainty. I put an end to the risk of being let down by a run-down battery.

PRICES WITH ‘INDICATORS’

Type DTG-C 2 volt	20 a.h.	5/-
Type DFG-C 2 volt	45 a.h.	9/-
Type DXG-C 2 volt	58 a.h.	10/-
Type DMG-C 2 volt	70 a.h.	12/-
Type DHG-C 2 volt	100 a.h.	15/6

* These prices do not apply to the Irish Free State.

Exide

“INDICATOR” BATTERY

For wireless H.T. get

Drydex

the Exide dry battery

Exide Batteries are obtainable in sizes to suit every set from Exide Service Stations and all reputable dealers. Exide Service Stations give service on every make of battery. ● EXIDE BATTERIES, Exide Works, Clifton Junction, near Manchester. Branches: London, Manchester, Birmingham, Bristol, Glasgow, Dublin, Belfast.

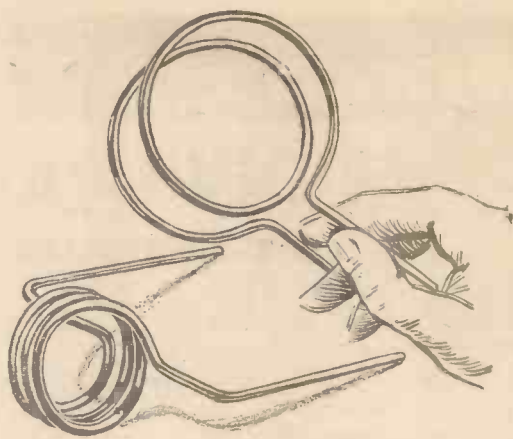
R.70.

‘STILL KEEPS GOING WHEN THE REST HAVE STOPPED’

Don’t Forget to Say That You Saw it in “A.W.”

With the Amateurs on the Short Waves

By KENNETH JOWERS



Any amateur can easily wind his own short-wave coils without difficulty. For ultra-short-wave coils not even a former is needed.

SOME few weeks ago I mentioned that the Norwegian station LA1G was getting rather worried about the number of amateur reports he was receiving from this country. As he was sending out some hundreds of QSL cards, all wanting the equivalent of 2½d. stamps, the postage bill was getting rather heavy.

The few words that I said on this matter did have quite a good effect, but, unfortunately, LA1G has written to me again, more worried than ever. In the last few days he had 140 letters from England of which only one sent postage and now he has sent over 600 cards since May.

Colossal Postage Bill

Although he likes to have these amateur reports, he really cannot afford such a colossal postage bill and he wants me to point out that in the future he will not be able to reply to English amateurs unless an international reply coupon is enclosed. BRS listeners will have their QSL cards sent via the R.S.G.B.

This sort of thing applies to all amateur transmitting stations who are often snowed under with reports, which all require replies. So do remember to send the international reply coupon.

Conditions in the south of England have, as far as I am concerned, been terrible during the past week or so. I have just got a new short-wave set using fifteen valves and even on that I have not been able to log very much in the way of DX.

During the week the only transmitters that have been coming over with any degree of consistency were W2DC of Scotia, New Jersey; W8BOG; W8CTE; W5IT of Texas; W3ATO; and W1UH. Of course, K4SA, W1CAA and W9USA were coming in all right, but these come in on even a single-valver these days.

Excellent Conditions

The English stations appear to have been getting over the other side very well indeed, for I had a number of reports from American transmitters commenting on the excellent conditions, particularly as regards G stations.

Jack Wilson's report this week rather bears out the fact that conditions are deteriorating. Amongst the stations that he has logged have been PAOPA, W3MD, W3AXT, and K4SA, in common with almost every other short-wave listener in the country, W1GPE, W3ATO and a Canadian

VE1EI, quite a poor log for him. Although Jack Wilson considers the 20-metre band is improving, at the moment conditions are definitely down.

I mentioned a little while ago that W9USA was the official amateur station at the Chicago State Fair. W1BAC tells me that any transmitter who has his licence in his pocket can go along to the Fair, operate this stations and obtain a diploma to that effect.

Several readers ask how they can obtain confirmation of reception of the schooner *Morrissey*. Well, reports should be sent via W2AV Brooklyn, New York, who schedules the *Morrissey* every day. Any messages for Capt. Bob Bartlett may be sent through W2AV.

Although the official call sign for this boat is W1OXDA, this is only for three frequencies, 8,655, 12,862, and 17,310 kilocycles. Frequencies of 6,425, 23,100 and 27,100 are also being used, but the call-sign is WHFZ.

Robert B. Moe, who has often been heard over this side, using the call W2UN, is in full charge of the radio gear on board the *Morrissey*.

R. D. Everard, of Standon, Herts, who lives just around my corner, is doing very well on the 20-metre band, using a Murphy A8 super-het and a short-wave unit. I don't know whether or not he is in a particularly good position, but he can always receive three stations to my two.

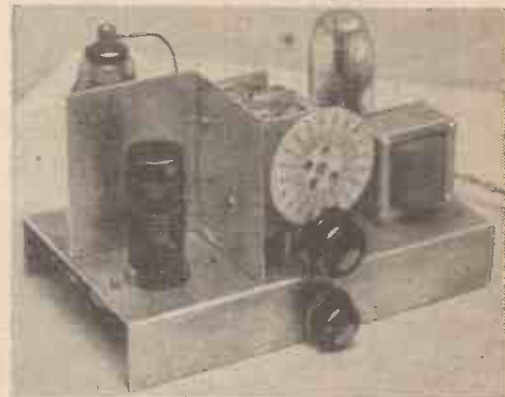
During the past week he has made some good contacts, including CM2NZ, W2CTS, W8TT, VE3JV, OH2ME and W8DLD. Funnily enough, although he cannot log W1OXDA at the moment, I have been picking this station up three or four times a week quite consistently.

At the moment I am going ahead with some experiments on a super-het with a variable crystal gate, so that I can really get some selectivity on the 20- and 40-metre bands. For those who are interested, crystals ready mounted in low-capacity holders can be bought from the Quartz Crystal Co. or the Brookes Measuring Tool Co. for about 30s. They are available for either 110 or 126 kilocycles, but I am not so sure that 496 would not be better.

Freedom from Interference

This frequency seems to give more complete freedom from troublesome second-channel interference, which is very bad indeed with 110 kilocycles. The advantage of the 110-kilocycle frequency is that I have some very nice intermediate-frequency transformers for this frequency that have an adjustable primary and secondary coupling.

As the two windings can be adjusted in this way, it enables me to vary the selectivity from about 6 to 15 kilocycles, which is very useful



A two-stage short-wave converter that will be shown at the Berlin Radio Exhibition. It uses a high-frequency pentode and a pentagrid oscillator/detector



A British-built amateur station that is breaking records in India. It is operated by VU2CY and is identical with 2KT over here

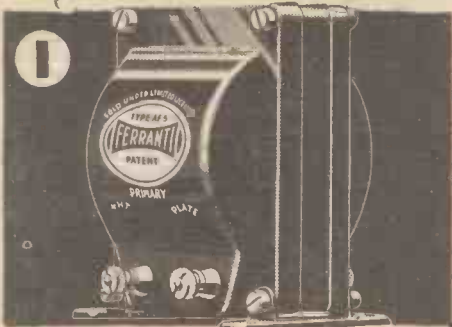
indeed. So I don't want to go over to 496-kilocycle coils with fixed coupling.

You will probably remember a few weeks ago that Wright and Weaire brought out some Mycalex short-wave components which were rather good. They have now designed a special highly efficient oscillator that goes down about 11 metres, so if you are thinking of making up a short wave super-het, bear this coil in mind.

When I compare the number of components that are available now to the home constructor and then remember the few on show at Olympia last year, I often wonder what has made the manufacturers suddenly realise that short-wave home constructors do exist.

Perhaps by this time next year we shall have a choice of component parts such as the Americans have.

OLD FRIENDS AND NEW.....



TRANSFORMERS

1 which make any set a better set. The AF5 illustrated here, price 30/- is the choice of engineers and musicians—specified wherever high amplification and nearly perfect reproduction are essential. (Ratio 1/3.5, Inductance 260/80 henrys, 0/10 m/A).

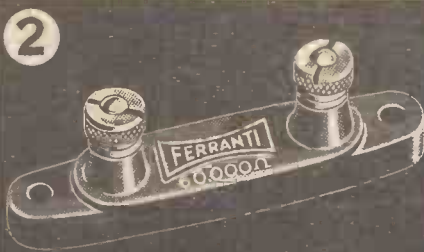
AT OLYMPIA

At Stand No. 70 you will see some old friends. The AF3 and AF5 will be there for instance, because after years of service, these transformers have proved their title to supremacy. But the many new friends will prove to be of interest to the Radio man whose watchword is "Quality." The AF9cs; the new Resistances; the Volume controls; the Electrolytic Condensers, and above all, the comprehensive range of Ferranti Valves. The new season's range of constructor's sets alone is worthy of the closest inspection. A display of Radio at its very best. A Wireless Exhibition in itself.

FERRANTI NEW RESISTANCES

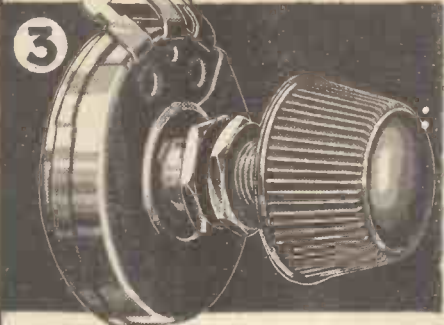
Types G·5, GH·5, G·1 and GH·1

2 Accurate to within 5% of their rated values, non-varying and maintaining the stated value even when working at full rate for long periods. Inductance and capacity negligible. From 300 ohms to 2 megohms. Price 1/- and 1/6 each. Without holder 6d. each less.



POTENTIOMETERS

3 Ferranti Potentiometers are constant in value and silky in action. Although not usually required to carry appreciable current they will dissipate 0.25 watt continuously. They have a slight negative temperature coefficient. Standard values: 50,000 ohms, 100,000 ohms, 250,000 ohms, 500,000 ohms, 1 megohm. Type P with knob as illustrated, Price 3/9 Type PS with knob and mains switch 4/6 Logarithmically graded types, 1/- each extra.



THE HEPTODE

4 The Ferranti VHT4 combines in one valve the function of both oscillator and modulator, and, in addition, is a variable Mu type, enabling full A.V.C. to be obtained in sets with only one I.F. stage. Price 20/- 2-volt Battery Heptode VHT2 also available Price 18/6



CONDENSERS

5 Ferranti (the lowest price quality condensers on the market) are made with extreme care to work efficiently and without possibility of breakdown. They are designed and made by engineers whose experience includes the building of condensers for working pressures of more than 1,000,000 volts. Prices from 1/-

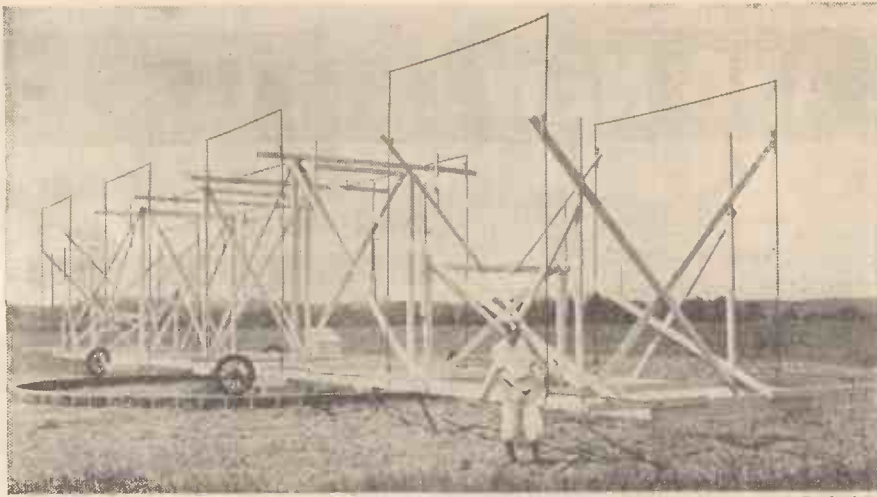
STAND No. 70



M.1. SUPER SPEAKER

After being unsurpassed for years the M.1. speaker is now available in a still better form. A new suspension better and freer than before and a remarkable magnet of aluminium steel with a gap half-inch deep, are now incorporated.

Write for leaflets to FERRANTI LTD., HOLLINWOOD, LANCASHIRE.



Saxl photo

This electrical telescope at Holmdel, New Jersey, searches the heavens for radio waves. K. G. Jansky designed it for his extensive researches into the highly complicated problem of static for Bell Telephone Laboratories

An Electric Lilliput Telescope Valves

FOLLOWING the lead of the astronomer who searches the heavens with his telescope, Karl G. Jansky, of the Bell Telephone Laboratories, has discovered a method of exploring the ether in search of static.

His electric telescope, shown in the photograph, consists of two parallel rows of zig-zag aerials, one placed behind the other to act as a reflector.

Sharply Directional Effect

The combination gives a sharply directional effect which enables the point of origin of each static impulse to be identified.

The arrangement is so sensitive that it responds to far-flung disturbances—just as a powerful telescope sweeps in a distant star—whilst the directive effect accurately "locates" each intruder as it arrives.

Each line of zig-zag aerials is made of $\frac{3}{4}$ in. brass piping, the whole array being mounted on a platform, which is constantly rotated by a synchronous motor at the rate of one complete revolution in every twenty minutes.

Observations taken by the "telescope" show that there are three distinct groups of static. The first comes from local thunderstorms and "storm centres," and generally travels through the atmosphere in a more or less straight path. Occasionally it sweeps around in a circular track and more rarely splits into two diverging lines.

Distant Storm Centre

The second group—which is of the "crash and rumble" variety—is the offshoot of a distant storm centre.

The third group is of the type which merely causes a "hiss" in the 'phones. It is easily distinguished from ordinary static, first by its strength, and secondly by the fact that its direction gradually changes during the day, so that from a wireless reception point of view it seems to "box the compass" once in every twenty-four hours.

It does not, however, quite complete the round. About midnight, when it has reached the north-west, it gradually dies away, and then reappears from a point nearer the east. The process is repeated day after day, and seems to indicate that its origin is in some way, not yet thoroughly understood, bound up with the apparent movement of the sun. L. S. K.

THE limit of the ordinary valve in short-wave working is reached at about 5 metres, though it is possible to handle still shorter wavelengths by putting a high positive voltage on the grid and using the so-called Barkhausen-Kurz circuit.

But in many cases the underlying idea in using these very short waves is that of portability. For instance, a portable 5-metre transmitter was used by an official at the recent Horse Show at Olympia for transmitting messages from the arena to other parts of the building. The whole set, including the short rod aerial, is no bigger than an ordinary rucksack, and is carried on the back in the same fashion. For this kind of work it is an obvious advantage to "scale down" the size of the valves and other components to correspond with the wavelength used.

Manufacturers are therefore beginning to produce valves to meet this demand. One American maker has marketed a small all-metal valve—somewhat on the lines of the Catkin. It is barely 1 in. long and only $\frac{1}{2}$ in. in diameter.

There is no glass bulb and no base. The outer metal covering forms the anode, and this in turn encloses the grid and filament inside. The leads are brought in directly, by a special sealing-in process, through end-plugs made of ceramic material.

Another type of "dwarf" valve is made in the shape of a button, something less than $\frac{3}{4}$ in. in diameter and half as thick. The electrodes inside the bulb are spaced apart by only a few thousandths of an inch, so as to reduce the actual distance through which the electron stream has to travel in passing from the cathode to the anode.

These button valves can be used to transmit and receive waves of the order of twenty

centimetres. The tuning coils consist of a few turns of wire wound around a former barely $\frac{1}{8}$ in. thick.

A five-valve short-wave receiver, fitted with "button" valves, complete in cabinet, will fit comfortably inside an overcoat pocket.

Another recent development in the short-wave field is the Magnetron, or split-anode valve, which depends upon the use of an external magnetic field to control the movements of the electron stream inside the bulb. L. S. K.

Station for Sale!

NOT very far from the Lizard is a wild part of Cornish coast where one of the most famous wireless stations in the world stands—Poldhu.

But it will not stand there for very much longer. Marconi's have just given orders for the sale of the whole of the transmitter.

Poldhu takes us back to the very beginnings of wireless—to Marconi's earliest struggles to convince the incredulous that wireless really was the eighth wonder of the world.

Right back in December, 1901, it was Poldhu that sent out the first signal across the Atlantic—thereby opening up vast possibilities.

It was during the next year—after the epoch-making trans-Atlantic transmission—that Marconi discovered the wonderfully increased range of signals at night as compared with the daytime.

Range After Nightfall

He found while crossing the Atlantic to Philadelphia that he could get Poldhu only up to 700 miles during daylight, but up to 2,000 miles after nightfall.

In the same year, too, a regular service was opened between Poldhu and Glace Bay, Canada, and two years later King Edward exchanged greetings with President Theodore Roosevelt by the aid of Poldhu on this side and Cape Cod on the other side of the Atlantic.

Since those early days of wireless pioneering the Poldhu station has played a wonderful part. During the war—especially it was invaluable for sending messages to all parts of the Empire.

As other stations grew up, though, the importance of Poldhu waned, and latterly it has been limited to experimental transmissions.

Not that it has been on the shelf entirely. For example, when the first telephonic communication was made between land and a ship at sea it was from Poldhu that the signals were sent—to the S.S. *Victorian* en route for Montreal.

It WAS Powerful!

Looking back, it is amusing to remember that when the Poldhu station was famous as the most powerful wireless station in the world its power was a meagre 10 kilowatts. How paltry this seems up against some of the high-power broadcasters of to-day, with their one to two hundred kilowatts!

Then again, the coming of the short-wave beam stations signalled the death knell of such old-timers as Poldhu, which has had its day.



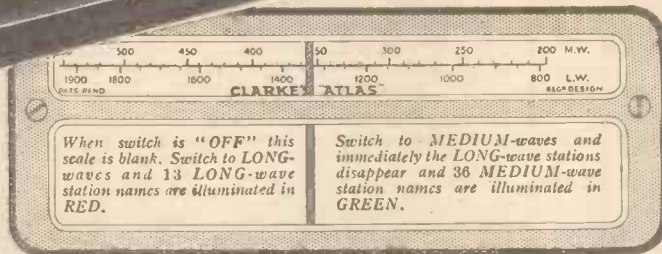
Saxl photo

American ultra short-wave transmitter tube

"SPECTRUM TUNING"



Pat. Pending



EXCLUSIVE

to the **NEW "ATLAS" SUPERHET**

No other radio set in the world gives such perfect superhet performance PLUS . . . "SPECTRUM TUNING" with Tilting Dial and the most beautiful of all cabinets. Only with "SPECTRUM TUNING" is there no confusion, no guesswork as to the station received. It gives the simplest and most certain station identification ever devised.

INGENIOUS TILTING SCALE

The revolutionary "SPECTRUM TUNING" scale tilts to any angle. It gives 49 of Europe's leading stations by name, and dozens of others can be received at full strength.

PERFECT SUPERHET PERFORMANCE

The wonderful "ATLAS" Superhet is a real joy to handle. Selectivity, range and volume are equal to any set, while its tone is unsurpassed for purity.

SPECIFICATION. 7 stages, 5 valves, 8 functions. For A.C. mains. Moving Coil Speaker, Band-Pass Tuning, Full Automatic Volume Control, Tone-Control, Noise Suppressor, Self-Contained Aerial. Guaranteed for 12 months. H.P. Terms 32/6d. deposit and 12 monthly payments of 25/- each. **CASH £14 14s. 0d.**

FINEST CABINET EVER MADE

Words cannot do justice to the beauty of the "ATLAS" cabinet. It is in every sense a triumph of the cabinet maker's craftsmanship. Chromium fittings strike a note that makes the "ATLAS" Superhet an asset to every room.

SEE IT AT OLYMPIA—STAND 85

POST THIS COUPON—NOW!

Messrs. H. Clarke & Co. (M/cr.) Ltd.,
Paticroft, Manchester.

Please send me full details of the wonderful new "Atlas 7-5-8" Set—the Super Superhet.

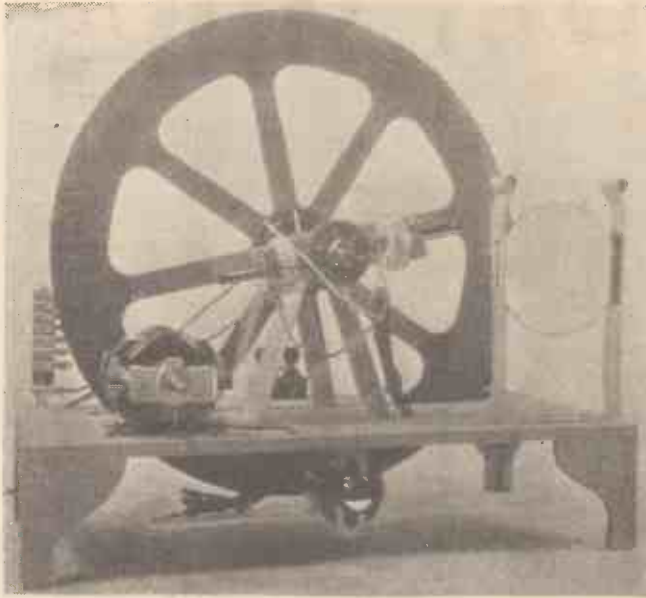
Name

Address

1/20

H. Clarke & Co. (M/cr.) Ltd., Paticroft, Manchester.
London: Bush House, W.C.2. Glasgow: G.E.S. Co. Ltd., 38 Oswald St. ☎1

Television for the Beginner



New television receiver made from a kit supplied by British Television Supplies, Ltd. The price is only £4 4s. for the A.C. model

BRITISH TELEVISION SUPPLIES, Ltd., are making a special point of producing simple equipment for beginners in television.

In addition to producing all of the important

driven off the motor shaft, the disc and motor are indirectly coupled by a simple gearing device.

This small point makes a very big difference to the smooth running of the disc as voltage

little components that are so hard to obtain, such as dropping resistances, lenses and power resistances, they have introduced a simple kit for battery or mains operation with which the amateur can obtain satisfactory pictures at a minimum of expense.

This kit is fundamentally similar for battery or mains operation, the difference being that for battery operation there is no need for a dropping resistance or power potentiometer, which accounts for the difference in price. The mains kit for either A.C. or D.C. costs 84s. and the battery kit (with a 6-volt 12-watt motor) 78s.

A 16-inch disc is used with a simple lens and holder and standard beehive type of neon lamp. A point which is rather interesting is that instead of the disc being directly

fluctuations do not appear to affect the revolutions of the motor to quite the same extent as they do when the motor and disc are directly coupled.

The high mains voltage is stepped down by means of a tapped resistance, so the motor is more or less suitable for all mains voltages. Final adjustments are made by means of a variable power resistance accessibly mounted.

Adding to the Enjoyment

It is unusual to find such a cheap kit equipped with a synchronising gear. The B.T.S. synchronising equipment enables the speed of the motor to be kept sensibly constant, greatly adding to the enjoyment obtained from the television transmissions. The kit is supplied complete with the synchronising coil, phonic wheel, and mounting bracket.

Complete details are given so that the kit can be constructed by the layman who is completely without any technical knowledge of television equipment. It will give good clear pictures from small receivers that give 1,100 milliwatts and upwards, so that users of battery sets are not prevented from interesting themselves in television transmissions.

Unlike a radio receiver, there are not any sensitive components likely to require adjustment or replacement. Connection to a radio receiver is simplicity itself, while synchronising is practically automatic.

For 78s. this kit should interest most amateurs, as it represents practically the lowest possible price for which one can obtain a television kit that will really give worth-while pictures.



PERFECT RECEPTION BETWEEN THEM!





NO-MAST
PATENT OUTDOOR
AERIAL

and

SILTIT
EVER-MOIST
EARTH

Neater, and far more efficient than the old-fashioned, ugly pole aerial. Enables you to tune in stations never heard before on your set, increasing volume and reducing interference. Is non-directional, designed for modern congested wavelengths. Especially valuable to flat dwellers.

The ever-moist 'earth' with maximum contact area through patent spreading antennae. No metal terminals to corrode or break away—the 8 ft. lead-in is an integral part of every "Siltit" earth. Completely efficient in any soil and any climate.

COMPLETE WITH ALL FITTINGS **10/6**

3/9

COMPLETE WITH 8 ft. LEAD-IN WIRE

See them at RADIOLYMPIA
NATIONAL RADIO EXHIBITION, OLYMPIA 1934
STAND No 4 Ground Floor

Sole Concessionaires:
CENTRAL EQUIPMENT LTD., 188/192 London Rd., LIVERPOOL

Forbes Keir Advertising.

You can get it!

- WITHOUT DICE



SEE & HEAR IT
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GRAND HALL
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MAGNAVOX PATENTS AND REGD. DESIGNS

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DOUBLE SIX!

MOVING COIL
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THE BENJAMIN ELECTRIC LTD. TOTTENHAM, N.17.

ON TOP AT OLYMPIA

SEE THE
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VALVES
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Osram valves

MADE IN ENGLAND

Sold By All
Wireless Dealers.

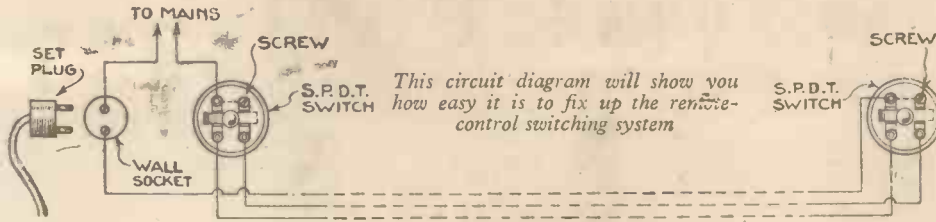
REDUCED PRICES

You can NOW buy OSRAM VALVES from 5'6

Adv. of The General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2.

Don't Forget to Say That You Saw it in "A.W."

Remote Switching for Mains Sets



THE small amount of trouble which the following suggestion involves is amply repaid by the fact that you don't have to leave your chair and wander off into another room to switch the set on or off.

Every listener has seen or used the switching method usually adopted in hall and landing lighting, whereby the light or lights can be controlled from the switch one is nearest. The arrangement is quite a simple one and it is a wonder that more use has not been made of it in respect to mains sets.

Special Switch and Three-Way Cable

A special type of switch is used, but these can be obtained from any electrical contractor together with the three-way cable used to connect them. It will be seen from the diagram that the switches are of the single-pole double-throw type, each being fitted with three terminals and one plain screw. The great advantage of this method is that it does not matter how far the switches are away. It can still be switched on and off at will.

It should be noted that one side of the socket which takes the set plug is connected direct to the mains. The other lead from the mains is taken to the terminal on one switch opposite, but on the same side as the plain screw.

The other two terminals on this switch are connected to their counterparts on the other switch. The third terminal is taken back to the other side of the set socket.

If the diagram is followed, the connections can be traced quite easily. The switch on the set must be kept in the "on" position.

Such a system as this installed between the living room and the bedroom, say, is a real boom, especially in the case of illness in the house. It is applicable to either alternating- or direct-current mains; in fact, it can be used in conjunction with battery sets if the length of wire is not too great, or else the voltage will be found to drop.

The plain screw in the switches forms a handy guide for the terminal connections, but it is not used in the wiring.

L. O. S.

will be available at low prices for aerial tuning, with and without reaction, and for high-frequency couplings.

As you can see from the accompanying photograph, the new Formo twin-gang condenser is a very striking component—the dial alone will attract a good deal of attention. It is one of the most pleasing aspects of the new components that they do set out to give a really professional touch to the amateur-made receiver.

Fighting Forest Fires with Radio

SINCE 1927 the United States Forest Service has utilised wireless as a help in combating forest fires, and now, after seven years of continual experimenting, the technicians employed by that service have evolved what must surely be the most efficient transmitting and receiving outfit that it is possible to carry on a man's back.

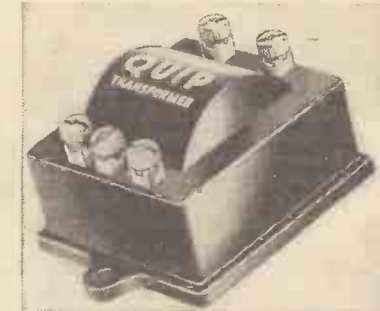
At first the lightest outfit they could design weighed, complete with headphones, batteries, and aerial and earth equipment, about 70 lb., but now their standard set weighs from 45 to 55 lb. only, according to the size of high-tension battery used.

Special Featherweight Outfit

They have also evolved a special featherweight outfit which weighs only 12 lb.; but, of course, it has a very limited range and, unlike the standard set, can only transmit morse-code signals.

The maximum guaranteed transmitting range of this featherweight outfit is but ten miles, and the time taken to assemble the set's aerial and earth equipment is about twenty minutes.

To demonstrate the use of this outfit, technicians recently gave one to a forest woodsman who was totally unused to a wireless receiver and, after showing him how to operate it, let him experiment for about an hour, after which time he was told to take it some distance into the forest, and transmit a short message that was written down for him in morse code.



Graham-Farish Quip low-frequency transformer, made in two ratios, one of 3 to 1 and the other 5 to 1

After walking some distance, the woodsman assembled his outfit, which incidentally only took him eighteen minutes to do, transmitted his message, received a reply, and then packed away his apparatus, all in 44 minutes.

These wireless outfits are for the use of the Forest Rangers who are continually patrolling the forests on the lookout for fires, and they are instructed immediately to inform the nearest look-out station by wireless whenever they discover a fire.

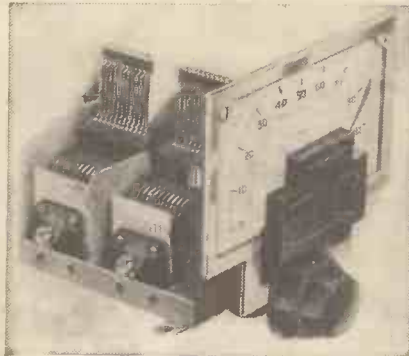
G. R. W.

Last-minute News

JUST as we close the Show number comes news of the latest Formo range of components, which this year includes some very striking apparatus.

The single-unit tuning condenser at 6s. 6d. is fitted with a really substantial tuning dial. As for the twin-gang condenser, priced at 11s., its very large open-scale type of calibrations is sure to create a favourable impression among constructors anxious to make the fronts of their sets extra attractive.

Screened paper condensers are an innovation that will also appeal to the home constructor. They are single-hole fixed. Sensity iron-core coils



New Formo two-gang condenser, model DU5

OSTAR-GANZ

UNIVERSAL HIGH VOLTAGE MAINS VALVES (Made in Vienna)

are the only Universal Valves that can be wired in Parallel. These's no wider, finer or more up-to-date range available. They work equally as well on either D.C. or A.C. supply without alteration of the Full Mains Voltage and they do not require Transformers, Barretters or Breakdown Resistances.

Because of their remarkable efficiency they have been specified and are fully recommended by "Wireless Press." KITS SUPPLIED FOR ALL TYPES OF RECEIVERS—RADIOGRAMS—AMPLIFIERS.

It is simple to convert Battery or any mains set to Universal AC/DC with Ostar-Ganz valves. Write now for full details of the range. Free technical assistance.

EUGEN FORBAT, 28-29, Southampton St., W.C.2
District Agents Wanted. Tele: Temple Bar 860

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The finest range of "Universal" A.C./D.C. All-Wave Receivers They operate on either A.C. or D.C. Mains from 100 to 250 volts

ALL models except the "Minature" cover Ultra Short Bands as well as medium and long wavebands.

ALL models are available as RADIOGRAMS in modern and compact cabinets.

ALL models are extremely economical in operation as no barretters or dropping resistances are employed and the filaments are connected directly across the mains.

ALL models, owing to the use of Ostar-Ganz Super Power output valves, give a greater undistorted output than corresponding sets on the market.

ALL models are completely hum-free on A.C. or D.C. mains.

UNIVERSAL HIGH VOLTAGE RADIO LTD., 28-29 SOUTHAMPTON STREET, LONDON W.C.2.



Write at once for full details and prices.

Telephone:
Temple Bar 4985.

Notes from a Short-wave Log

By J. GODCHAUX ABRAHAMS

CONDITIONS during the past week have been from fair to middling, but taken all round they have shown strong signs of improvement.

In recent notes I mentioned that Vienna OER₂ was again on the air; this station is used purely for experimental purposes and there is every reason to believe that a more powerful transmitter is to be installed at the earliest opportunity.

Searching around recently I happened to pick up WQV, Rocky Point (New York) on 20.27 metres (14,800 kilocycles) which was making arrangements with Radio Nations (Prangins, Switzerland) for a relay to the N.B.C. network of a broadcast from Vienna. This proves that OER₂ cannot be relied upon for the reception in the U.S.A. of the Austrian programmes, and shows a new channel for international relays of music.

Next year, and perhaps even this winter, we may look forward to a number of more powerful short-wave transmitters at our disposal. By the end of December, France may have its new Paris-Colonial station (25-60 kilowatts) in operation, for which channels in the 13-, 16-, 19-, 25-, 31- and 49-metre bands are to be used.

Also VK₃LR, Lindhurst, near Melbourne (Victoria), now on 31.29 metres, is proposing to erect further transmitters to cover wavelengths in other bands. In addition, the success achieved by LSX, Monte Grande (Argentine), has also induced the authorities to plan broadcasts on other channels, and China during the autumn may see an 18.5 kilowatt short-wave station in action for the purpose of diffusing musical programmes in the ether.

A Canadian transmission from Winnipeg (Ontario) has been picked up on 48.78 metres (6,150 kilocycles), of which it was thought the call was CTRO. If this is so, it would be VE₅CL, working the CJRX-VE₉JR programmes, and which has been out of action for over eighteen months.

As short-wave fans are continually scouring the ether, it is not surprising that little takes place which is not brought to their ears. The broadcast made during the recent—and almost tragic—ascend in the stratosphere from the United States was picked up by an amateur in the British Isles. Max Cosyns, the associate of the Belgian Professor Piccard in his first attempt, is shortly carrying out an ascent on his own. The date has not been fixed, but the call will be Bg, and the wavelengths 41.15, 41.53, and 41.78 metres.

I understand that another trial may be made from South Dakota (U.S.A.) during this or next month. Under call letters W10XCW, transmissions will be carried out on 22.99 metres.

These NEW Products TRANSFORM TRANSFORMER VALUES



4/6

One of the most astounding Graham Farish contributions to better and lower priced 1935 radio. Alternative ratios of 1-1, 1-2, 1-4, 1-3, 1-5, 1-6 and 1-7½ are obtainable with the same transformer. Fitted with the new type of terminal developed by Graham Farish for the home constructor. Without doubt the greatest value in radio to-day. Price 4/6

QUIP TRANSFORMER

Suitable for the new Q.P.P. double Pentode valves or any push-pull circuit requiring a high step-up ratio, parallel fed. It has a high primary inductance of 60/70 henries and straight line amplification over 50 to 9,000 cycles and a full step-up ratio of 1/8. Extremely low capacity windings and minimum flux leakage. Price 10/6



and a NEW Ohmite Volume Control for only 2/9

Yet another striking example of Graham Farish value. Element of extra high current-carrying capacity. Spring wiper operating through a cylindrical sleeve ensures a firm but positive point contact. Finished in black bakelite with dreadnought grey metal cover, complete with control knob. Price 2/9



Visit our Stand No. 59 at Radiolympia. August 16—August 25.

GRAHAM FARISH Ltd., BROMLEY, KENT

RADIO MADE EASY for the BEGINNER!

"An Elementary Wireless Course for Beginners" has been written particularly for the listener who wants to know how his wireless set works. It successfully avoids textbook style, yet every line in the book is technically accurate. 131 ILLUSTRATIONS! The unique illustrations, there are 131 in all, are a remarkable feature and constitute the finest series of explanatory diagrams ever included in any volume on the subject. AND OVER 270 PAGES! The 32 chapters of this book cover nearly 300 pages and, at the remarkable low cost of 3s. 6d. Send for your copy to-day, together with remittance for 3s. 10d. to the publishers: BERNARD JONES PUBLICATIONS, LTD., 58-61 Fetter Lane, E.C.4

ALWAYS SPECIFIED

Obtainable from all Good Dealers. In cases of difficulty send direct to: Sole Wholesale Distributors: **BRITISH RADIOGRAMPHONE CO. LTD.** Pilot House, Church Street, Stoke Newington, London, N.16.

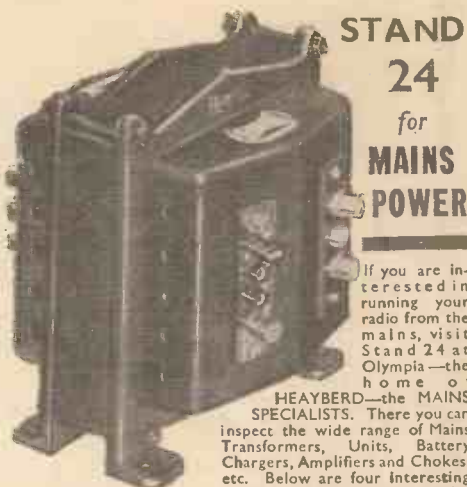
METAPLEX

EXCLUSIVELY SPECIFIED BY THE EDITOR OF AMATEUR WIRELESS

The Metallised Baseboard that has come to stay. REFUSE SUBSTITUTES.

BASEBOARDS

ADVT.



**STAND
24
for
MAINS
POWER**

If you are interested in running your radio from the mains, visit Stand 24 at Olympia—the home of HEYBERD—the MAINS SPECIALISTS. There you can inspect the wide range of Mains Transformers, Units, Battery Chargers, Amplifiers and Chokes, etc. Below are four interesting points about the NEW Mains

Unit Heyberd have introduced—Model 15/50.

1. The Voltage regulation remains practically constant at 150v. throughout the whole range of 15-50 m.a.
2. Can be used, with extremely satisfactory results from Class "B" operation.
3. Excellent smoothing. Absolutely free from all hum and background.
4. Made with BRITISH materials throughout.

MODEL 15/50—PRICE 88/6

Output: 150v. at 15-50 m.a. H.T.1, variable 40-110v. H.T.2, variable 60-130v. H.T.3, fixed 150v.

If you cannot come to the show, send your name and address, attaching this advertisement and 3d. in stamps for copy of the new 1934 Radio Handbook.

F. C. HEYBERD & Co.
10, FINSBURY STREET,
LONDON - E.C.2.

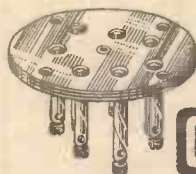


**WHEN BUYING
AN UMBRELLA
YOU LOOK AT
THE FRAME**



**WHEN BUYING
A RECEIVER,
LOOK AT THE
VALVEHOLDERS**

Ask the Salesman what make of Valveholders are used in the receiver you look at. If he says CLIX, and nine out of ten do say CLIX, then you can be satisfied that the receiver is modern and built of quality components throughout.



Many other "Clix" components are specified by "Amateur Wireless" and used by manufacturers. Get our New 1935 Folder "A" Free.

STAND 218 OLYMPIA

CLIX

**LECTRO LINX, LTD.,
79^A ROCHESTER ROW LONDON S.W.1**

My Broadcasting Diary

Sunday

A PERFECT evening. Reclined in the garden and listened to the London Philharmonic Orchestra, conducted by Aylmer Buesst, with Frank Laffitte as solo pianist. Thought the MacDowell concerto just the thing for a hot Sunday evening. Felt too lazy for Beethoven or Brahms. Ditto the Glazounov Suite.

There is something about classical music of the lighter type which appeals to me when I am tired, whereas to listen to rubbish would only irritate. One of the uses of wireless is to soothe yourself with it when you are feeling slack. Laffitte played remarkably well, I thought.

Monday

ONE thing about *Dancing Through*, with its 149 tunes, it didn't need listening to very carefully. I mean I shouldn't have minded recognising only 148, or anything like that. Geraldo must really try to do his 150 up next time, but it was all very good—except about 140 of the tunes. The other nine were really attractive, but I have always liked them. Our dance tunes want something doing to them badly. Only one in ten worth keeping.

Tuesday

CHARLES BREWER produced and "compèred" another of the *May-We-Come-Ins* to-night very successfully. I like his style as a "compère." The Third Jane being unavailable, the Three Janes were transmuted to Two Janes and a Jack. "Don't let your heart go wrong" very effective—and without suggesting sal volatile.

Patricia Rossborough pleased me in her syncopated piano solos, which is saying something, I may tell her. I generally regard that sort of playing as synthetic and not to be encouraged. Her touch, however, showed musicianship.

George Buck has improved his patter. I think he may soon come into the front line of comedians. He ought because he is able to sing. It always rejoices my heart to hear a man sing a comedy song with some tone in his voice.

Ronald Frankau has a very distinctive style. I liked his "What does it matter to us?" but I always think he is very charming in his child's verses. He might well adopt a plan for one of his future broadcasts and begin with something really picturesque in the verse line, and then branch out into wit and satire as much as he likes. Just a suggestion.

The Buggins Family scene at the photographers was quite good but suffered a little from length. On the other hand Mabel's sure technique was behind it, proved by the fact that it was so easy to follow. That is all about it. Wanted condensing. In fact, another item could have been squeezed into that show without unduly curtailing anyone.

Wednesday

DEFINITELY of opinion that these outside relays of variety are not the success they are supposed to be. To begin with, nearly all the theatres are wrong acoustically, and all the items are too long. To-night's relay annoyed me, to be candid.

Clifford Stanton, giving impressions, was probably excellent—at the Liverpool Theatre. The applause proved it. In the radio sense he became tiring. Had he been in a studio vaudeville he would not have been allowed that length.

Then again, Philip Ward, an instrumentalist, was excellent but... well, far too much of him. Arthur Prince and Leslie Weston I never heard at all. Cut off for the news. No: decidedly unsatisfactory.

Thursday

SOMETHING the matter with me to-night. Think I have contracted a Wimbledon Throat. Must have been through listening to the running commentary. Temperature 102. You'll excuse me, won't you? I'm for bed.

Friday

HENRY HALL, having a great reception to-night at the Palladium. Very glad. He deserves it.

Heard a bit of *Wild Violets* from my bed, but they sounded rather too wild. (Mercury 101). Aren't we radio critics a marvellous race? Devotion to duty and all that sort of thing! Still, admit to having shouted down stairs: "For heaven's sake shut that thing off." Ah, that's more like. Couldn't have endured another second.

Saturday

BETTER, thank you! A good variety. Bob and Alf Pearson seem to have sprung out of the past. Very glad to hear them again. Thought them better than ever.

Charles Heslop and Ronald Simpson excellent. No idea Ronald was equal to this sort of thing. *Highly recommended for promotion for a new style of wit.*

Tony Capaldi imitated trains and airplanes and all sorts of things on an accordeon. He has evidently discovered the real use for the instrument. I should like to hear him again—so long as he doesn't attempt to play anything on it.

Bertha Willmott excellent and evidently very popular.

Haver and Lee were really funny. Some time ago I suggested they should change their act from its rather sordid setting. This they seem to have done with excellent effect. Hold it like that, boys!

Jack Barty. Only his second broadcast? Why? He is tip-top. *Note to Johnnie Sharnan*: Just book that gentleman every time you find he isn't making pictures.

Twenty Years Ago interested me all through. I found myself sorting my facts a good deal. A fine broadcast, well produced. Impressive, too.

Hear Your Favourites at Radiolympia

Continued from page 153

music hall artists as before, with Sydney Baynes to back up the whole show.

Relays of this second bill are to be given on August 20 from 6.35 to 7.30 p.m. nationally, and on August 22 from 9.15 to 10 p.m. regionally.

For the third bill, lasting from August 23 to the closing night on Saturday, August 25, still more artists come into the picture. In addition to the Old-timers, Henry Hall and the Wade girls, we shall have Stainless Stephen, Alec McGill and Gwen Vaughan—not forgetting Stanelli and his Hornchestra.

Relays of this last show are arranged for August 25 on the National—from 8 to 9 p.m.

Broadcast Wavelengths

This week we give details of the principal short-wavers and the European long-wave stations. Next week we shall publish a list of medium-wave transmitters

Principal Short-wavers

Metres	Kilo-cycles	Station and call sign	Country
11.67	25,700	New Brunswick, N.J. (W2XBC)	United States.....
13.93	21,540	Pittsburgh (W8XK)	United States.....
13.97	21,470	Daventry (GSH)	Great Britain.....
13.98	21,463	Boston (W1XAL)	United States.....
14.00	21,420	Deal, N.J. (W2XDJ)	United States.....
14.17	21,160	Buenos Aires (LSL)	Argent. Republic
14.28	21,000	Podebrady (OKO)	Czechoslovakia ..
14.47	20,730	Buenos Aires (LSY)	Argent. Republic
14.72	20,380	Rugby (GAA)	Great Britain.....
15.25	19,540	Rome (IRV)	Italy.....
15.78	18,900	Prangins (HBF)	Switzerland.....
16.86	17,790	Daventry (GSG)	Great Britain.....
16.87	17,780	Boundbrook (W3XAL)	United States.....
16.88	17,770	Eindhoven (PHI)	Holland.....
16.89	17,760	Zeese (DJE)	Germany.....
19.47	15,410	Riobamba (PRADO)	Ecuador.....
19.56	15,340	Schenectady (W2XAD)	United States.....
19.64	15,270	Wayne (N.J.) (W2 & E)	United States.....
19.67	15,250	Boston (W1XAL)	United States.....
19.68	15,243	Paris (Colonial) (FYA)	France.....
19.72	15,210	East Pittsburgh (W8XK)	United States.....
19.73	15,200	Zeese (DJB)	Germany.....
19.82	15,140	Daventry (GSF)	Great Britain.....
19.84	15,122	Vatican (HVJ)	Italy.....
23.39	12,825	Rabat (CNR)	Morocco.....
24.53	12,230	Lisbon (CTICT)	Portugal.....
25.00	12,000	Moscow (RNE)	U.S.S.R.....
25.25	11,880	Paris (FYA)	France.....
25.27	11,870	E. Pittsburgh (W8XK)	United States.....
25.3	11,860	Daventry (GSE)	Great Britain.....
25.40	11,810	Rome (2RO)	Italy.....
25.45	11,790	Boston (W1XAL)	United States.....
25.51	11,760	Zeese (DJD)	Germany.....
25.53	11,750	Daventry (GSD)	Great Britain.....
25.63	11,705	Paris (Colonial)	France.....
26.83	11,181	Funchal (CT3AQ)	Madeira.....
28.98	10,350	Monte Grande (LSX)	Argent. Republic
29.04	10,330	Ruyselede (ORK)	Belgium.....
30.43	9,860	Madrid (EAO)	Spain.....
31.25	9,600	Lisbon (CT1AA)	Portugal.....
31.28	9,590	Philadelphia (W3XAU)	United States.....
31.28	9,590	Sydney (VK2ME)	New South Wales
31.3	9,585	Daventry (GSC)	Great Britain.....
31.35	9,570	Boston (W1XAZ)	United States.....
31.36	9,565	Bombay (VUB)	India.....
31.38	9,560	Zeese (DJA)	Germany.....
31.45	9,540	Jeloy (LKJ)	Norway.....
31.48	9,530	Schenectady (W2XAF)	United States.....
31.51	9,520	Skamleback	Denmark.....
31.55	9,510	Daventry (GSB)	Great Britain.....
31.55	9,510	Caracas (YV3BC)	Venezuela.....
36.65	8,186	Rio de Janeiro (PRA)	Brazil.....
37.48	8,035	Rabat (CNR)	Morocco.....
38.47	7,797	Radio Nations (HBP)	Switzerland.....
43.86	6,840	Budapest (HAT2)	Hungary.....
45.38	6,610	Moscow (RW72)	U.S.S.R.....
46.53	6,447	Barranquilla (HJ1AB)	Colombia.....
46.69	6,425	Boundbrook (W3XL)	United States.....
48.86	6,140	Pittsburgh (W8XK)	United States.....
49.02	6,120	Wayne (W2XE)	United States.....
49.08	6,112	Caracas (YV1BC)	Venezuela.....
49.18	6,110	Chicago (W9XF)	United States.....
49.18	6,110	Boundbrook (W3XAL)	United States.....
49.22	6,095	Bowmanville (VE9GW)	Canada.....
49.5	6,065	Nairobi (VQ7LO)	Kenya Colony.....
49.48	6,060	Byberry (W3XAU)	United States.....
49.48	6,060	Mason (W8XAL)	United States.....
49.5	6,060	Skamlebaek (OXY)	Denmark.....
49.59	6,050	Daventry (GSA)	Great Britain.....
49.67	6,040	Boston (W1XAL)	United States.....
49.83	6,020	Zeese (DJC)	Germany.....
49.92	6,010	Havana (COC)	Cuba.....
49.96	6,005	Montreal (VE9DR)	Canada.....
50.0	6,000	Moscow (RNE)	U.S.S.R.....
50.26	5,969	Vatican (HVJ)	Italy.....



1 Watt 1%
2 Watt 2%
3 Watt 3%

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- SEALED IN CERAMIC TUBES—MOISTURE PROOF
- USED EXCLUSIVELY BY LEADING RADIO MANUFACTURERS
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- EXPERTS CONTINUALLY SPECIFY
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- YET THE GREATEST REASON OF ALL IS —THEY BEAR THE NAME DUBILIER

DUBILIER RESISTANCES

Write for free NEW 1934 Illustrated Booklet
DUBILIER CONDENSER CO. (1925) LTD., DUCON WORKS, VICTORIA RD., N. ACTON, W.3.

Long-wave Stations

Metres	Kilo-cycles	Station and Call Sign	Country	Power (Kw.)
1,107	271	Moscow (RCZ)	U.S.S.R.	100
1,145	262	Madona	Latvia	20
1,154	260	Oslo	Norway	60
1,209.6	248	Scheveningen Haven	Holland	5
1,224	245	Leningrad	U.S.S.R.	100
1,250	240	Vienna (Exp)	Austria	3
1,261	238	Kalundborg	Denmark	60
1,293	232	Kharkov	U.S.S.R.	35
1,304	230	Radio Luxembourg	Grand Duchy	100
1,312.9	229	Ankara	Turkey	7
1,339	224	Warsaw	Poland	120
1,354	221	Motala	Sweden	30
1,395	215	Eiffel Tower (Paris)	France	8
1,442	208	Reykjavik	Iceland	16
1,442	208	Minsk	U.S.S.R.	35
1,500	200	Daventry National	Great Britain	30
1,570.7	191	Deutschlandsender	Germany	60
1,612.3	186	Istanbul	Turkey	5
1,648.3	182	Radio Paris	France	80
1,724.1	174	Moscow (I)	U.S.S.R.	500
1,807.2	166	Lahti	Finland	40
1,875	160	Hilversum	Holland	50
1,886.7	159	Brasov	Roumania	20
1,935	155	Kaunas	Lithuania	7

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GILBERT
Cabinet Maker - SWINDON
Estimates Free. Est. 1886

10,000 MOTORS

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The first firm to supply Wireless parts on easy payments. Nine years advertiser in "Amateur Wireless." Thousands of satisfied customers.

	Monthly Deposit payments
TELSEN Latest 323 Kit	29/6 4/- 7 of 4/1
TELSEN S.G.3 Kit	39/6 4/4 9 of 4/4
LISSEN Skyscraper 4 Kit	112/6 10/- 11 of 10/3
EXIDE H.T. Accu., 120-v.	60/- 6/- 9 of 6/8
ATLAS Eliminator C.A.25	59/6 5/- 11 of 5/6
BLUE SPOT 29P.M.	32/6 4/5 7 of 4/5
B.T.H. Pick-up Vol. Con.	21/- 3/10 5 of 3/10
EPOCH 20th C. M.C.	35/- 4/10 7 of 4/10

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and WHEN THE SHOW WAS OPENED

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ALL-BRITISH

CONDENSERS

The Telegraph Condenser Co., Ltd.,
Wales Farm Road, N. Acton, W.3.

**SEE THE
COMPLETE
RANGE ON
STAND 37**

5304

More High-power Stations

By JAY COOTE

MANY of you may have observed the great improvement in signals received from Königsberg (Heilsberg) since the beginning of the month. This amelioration is due to the fact that the Portuguese station CT1GL at Parede, near Lisbon, which was working on the same channel, has now closed down.

Although started when Portugal possessed no broadcasting system, it has not been able to face the competition put up by the official transmitter at Barcarena on 476.9 metres. (By the way, from the latter we now hear the call: "Emissora Nacional Radio Lisboa".)

Eiffel Tower Still Going!

Another station which was expected to disappear ere this—at least from the long-wave band—is Eiffel Tower, as the French state system is now using two channels above 1,000 metres for its broadcasts. In reply to a recent question in the Chamber of Deputies, it was stated that it was the Government's intention to reduce the wavelength of FL to 206 metres, but the work entailed for this alteration would take several months.

In the meantime the Eiffel Tower is to continue to broadcast on 1,389 metres with a power of 15 kilowatts until 1930 B.S.T.; after that hour the output is reduced to roughly 8 kilowatts. The question of power is one which, in view of recent events on the Continent, is again interesting all Europe. The great increase in the radiation of German stations is proving an incentive to other neighbouring countries.

Latest reports from Italy intimate that Rome, as soon as possible, is to be boosted up to the extent of 120 kilowatts; others will follow. Radio Romania, the new national station destined to Bucarest, is already being built; it will be of the 150-kilowatt class. On the other hand, although rumours have been current that Radio Luxembourg was not satisfied with the power of its station, the authorities have denied that it is their intention to enhance its output. As it is, the broadcasts are well heard over the greater part of Western and Central Europe.

A further addition, however, in 1935 to the list of Continental giants will be that of the 150-kilowatt which the Finnish Government has ordered from Marconi's Wireless Telegraph Company, and which is to take over the duties of the station now working at Lahti.

Improved Reception

With the temporary breaking of the heat wave and the advent of rain, reception of distant stations on the medium and long wave-bands has greatly improved. On most days it has been possible to listen to many foreign transmissions during daylight hours and with the coming of dusk the number has materially increased.

A station which I had not logged for some time was Radio Vitus, Paris, now on 223 metres; its call is somewhat misleading as it now styles itself "Radio Ile de France," which would seem to imply that it was installed on an island off the coast of that country—in effect it is also the French term for Mauritius.

But Ile de France is the name, dating from 1429, given to an old district or military province of which Paris was the capital.

The Italian stations such as Trieste, Turin, Milan and Florence come in as if they were locals, and recently both San Sebastian and Madrid have appeared frequently in my log.



"We're Fluxite and Solder— The reliable pair; Famous for Soldering, Known everywhere!"

"As a Wireless Constructor— there isn't a doubt; You can't go far wrong— if WE are about!"

ALL MECHANICS WILL HAVE **FLUXITE** IT SIMPLIFIES ALL SOLDERING

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Improved pedestal model, bakelite case, containing high-ratio transformer 15/-.

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CROONERS. Lapel Mikes for dance bands. American model, 12/6.

PARTS FOR HOME CONSTRUCTORS. Microphone Carbon Granules, in glass capsule, enough for four buttons. Grade No. 1, 8d.; No. 2, Medium, 1/-; No. 3, Fine, 1/6; Carbon, solid back, blocks, 3d. Mouthpieces, curved or straight, 10d. Carbon diaphragm, 5s m/m., 4d. Panel Brackets, pivoted, 5/-; Reed Receiver Unit, for amplifier making, 3/-; Headphones, 2/9 pair.

EISEL MIKE. The famous Eisel Public Address and Band Mike (Reisz principle), 55/-. Highest quality uniform response. Can be obtained from us only. Worth £5, but Our Price 55/-; Stand 15/- extra. Screened Imped Matched Transformer, 7/6.

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Postcard Radio Literature

Here "Observer" reviews the latest booklets and folders issued by well-known manufacturers. If you want copies of any or all of them FREE OF CHARGE, just send a postcard giving the index numbers of the catalogues required (shown at the end of each paragraph) to "Postcard Radio Literature," AMATEUR WIRELESS, 58/61 Fetter Lane, E.C.4. "Observer" will see that you get all the literature you desire. Please write your name and address in block letters.

New Cossor Melody Maker

EVERY builder of the original Cossor Melody Maker must get a copy of the folder describing the new Cossor Melody Maker, model 352. The circuit of the new receiver is variable-mu screen-grid detector and low-consumption pentode; the pentode feeds a moving-coil loud-speaker. The receiver, loud-speaker and batteries are contained in a superb cabinet 18 in. high and 14 in. wide.

Provision is made for extension loud-speaker and pick-up. 171

Goltone Components

WARD & GOLDSTONE'S new catalogue contains details of almost every accessory and component needed by the home constructor. Any little gadget you want you will find in the new catalogue.

Short-wave fans will also find this catalogue useful, for it gives details of numerous short-wave components and accessories. 172

"The Battery Book"

THIS useful little book is produced by Britannia Batteries, Ltd. It is a complete guide to the correct type of high-tension and grid-bias batteries and low-tension accumulator for your receiver.

Details of new blue-carton power batteries, which are of the 10-12 milliampere discharge range, are included.

The catalogue number, voltage, tappings, dimensions, and price of every battery are given.

The working of a high-tension battery is also explained. A very interesting booklet. 173

Parmeko List A

TO mains users, this catalogue will be of great interest. It gives details of transformers for all standard valve and metal rectifiers. Smoothing chokes for normal and heavy-duty working, permanent-magnet moving-coil loud-speakers and large-capacity high-voltage condensers are also described in this list. 174

New Loud-speaker Standard

THE Magnavox model Sixty-six sets a new standard in loud-speaker design. A booklet is devoted entirely to the description of this amazing loud-speaker. Every home constructor should make himself familiar with the design, construction, and performance of this new job.

A.C. and D.C. models are available. 175

Television Components

Peto-Scott Co., Ltd., of 77 City Road, London, E.C.1, have issued a folder of television parts and components. The items listed include all those likely to be required by the amateur constructor and experimenter. 176

Bryce Mains Equipment

THE new season's list of Bryce transformers is now available.

A Bryce transformer for almost any type of receiver is listed.

Astatic mains transformers, specially suitable for television and cathode-ray work because of their very small amount of external radiation, are included in the list. 177

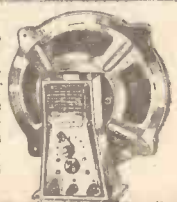
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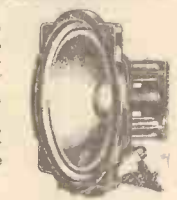
For Power, Pentode and Class "B." Send only 2/6 for 7 day's trial. If approved, balance in 7 monthly payments of 4/9. Cash or C.O.D. Carriage Paid, £1/12/6



BLUE SPOT "STAR" JUNIOR P.M. MOVING-COIL SPEAKER

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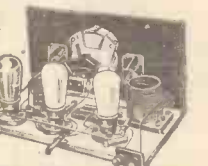
With 12-point matching transformer suitable for all outputs. Send only 2/6 for 7 days' trial. If approved, balance in 7 monthly payments of 5/-. Cash or C.O.D. Carriage Paid, £1/15/0.



TELSEN "323" KIT

Complete Kit of Parts for new Telsen Straight 3. Send only 2/6; balance in 6 monthly payments of 5/-. Cash or C.O.D. Carriage Paid, £1/9/6.

If valves required, add £1/8/6 to cash price or 8/- deposit and 9 monthly payments of 6/-.



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With 1 1/2-size Cone and tapped Input Transformer. Send only 2/6 for 7 days' trial. If approved, balance in 5 monthly payments of 4/8. Cash or C.O.D. Carriage Paid, £1/2/6. Power or 2-mode Model, same price and terms. When ordering, state which type required. De Luxe Model for power or pentode 30/- (Cash in 7 days) or 2/6 deposit and 6 monthly payments of 5/-.



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The amount of the Deposit and Fee must be remitted by Postal Order or Registered Letter (Cheques cannot be accepted), addressed to "Amateur Wireless" Advertisement Department, 58/61 Fetter Lane, London, E.C.4.

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AMPLION A.R.19 HORN LOUD-SPEAKERS, with A. Wooden Flare. Original list price, 105/-; our price, 9/11. Ideal for extension loud-speaker.

REVO HORN LOUD-SPEAKERS, Metal Flare. Original list price, 65/-; our price, 6/11. Suitable for extension speaker.

UNIVERSE PICK-UP AND TONE-ARM, complete with Volume Control. List price, 22/6; our price, 12/11.

IGRANIC 2-GANG CONDENSERS, complete with cover (plain boxes). List price, 12/6; our price, 6/9.

IGRANIC 3-GANG CONDENSERS. List price, 17/6; our price, 8/11.

WONDER MICROPHONES. List price, 7/6 each; our price, 4/9.

TRIOTRON CLASS-B AMPLIFIER with Tone Control, but without Valves. List price, 25/6; our price, 10/6 each.

MILLGATE A.G. TRICKLE CHARGER, fitted with Westinghouse Metal Rectifier. List price, 27/6; our price, 17/6. For 2-, 4-, or 6-volt.

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CHEAP condensers and resistors for the home-constructor are being marketed by the Franklin Electric Co., Ltd. These components can be obtained singly or on a card which holds all of the values likely to be wanted.

The resistors are of the 1-watt type and cost 6d. for all values between 50 and 500,000 ohms, while the 2-watt types cost but 1s.

These resistors are all colour-coded in the standard code so that the values can always be seen without having to bother about removing the resistors from the receiver.

Tubular condensers with wired ends are available in all values from .001 microfarad to .5 microfarad and prices vary between 6d. and 1s. 6d.

The Franklin Electric Co. will supply a card on which are mounted twenty-seven condensers of different values. Any constructor with this card can always be sure of having the correct value of condenser handy.

All About the New Sets

Continued from page 176

one hundred stations are calibrated on a station dial. It is claimed that all extraneous noises are eliminated and that daylight range is exceptional because of the extra high-frequency stage.

Telsen sets are among the few that include six receiving valves. A six-valve automatic-record-changing radiogram plays eight records without a break. The price is reasonable, being 32 guineas.

All the new Telsen sets feature the interchangeable Pointergraph, a special tuning dial calibrated in station names and wavelengths, while on the extreme right of the dial is a visual-tuning indicator device. Every set, almost needless to add, has self-adjusting volume control.

Skyscraper kits are again featured in the extensive Lissen (Stand No. 83) range this year. In addition to the band-pass three kit at £4 19s. 6d. there is the Skyscraper Three, an A.C. version of this set, and an all-waver.

The new Skyscrapers have all been equipped with band-pass input circuits, use a variable-mu screen-grid stage, and have special power output pentodes for good volume with pleasing quality. Tone control is also available.

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EKCO 4T. 60 m/A. Neg., S.G., 120-150. List Price, 75/-; 7/6 to clear.

EKCO IV. 20 m/A. Neg., 30, 60, 150. List Price, 55/-; 4/6 to clear.

EKCO IF. 10 m/A. Neg., 120. List Price, 17/6; 2/- to clear.

ATLAS 25 m/A. Neg., 40, 60, 90, 120. List, 57/6; 5/- to clear.

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SUPREMUS B. 25 m/A. Neg., 60, 120, 150. List, 37/6; 3/6 to clear.

MARCONI. 10 m/A. Neg., 60, 120. List, 35/-; 2/6 to clear.

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CLIMAX M66. 50 m/A. Neg., 40, 60, 120. List, 34/-; 4/6 to clear.

ISSEN. Type A. Neg., 40, 60, 120. List, 27/6; 3/6 to clear.

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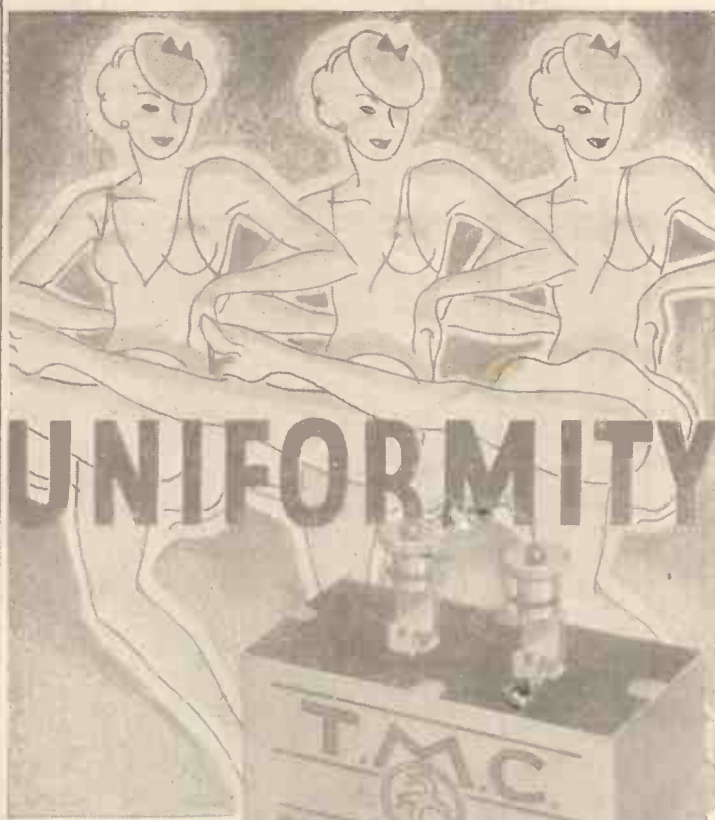
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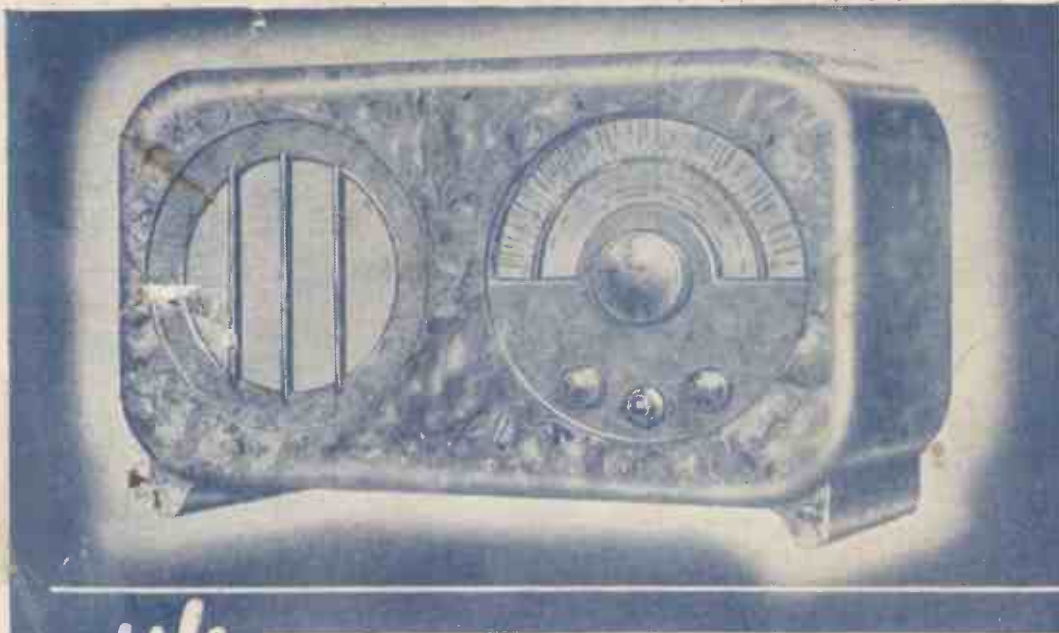
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