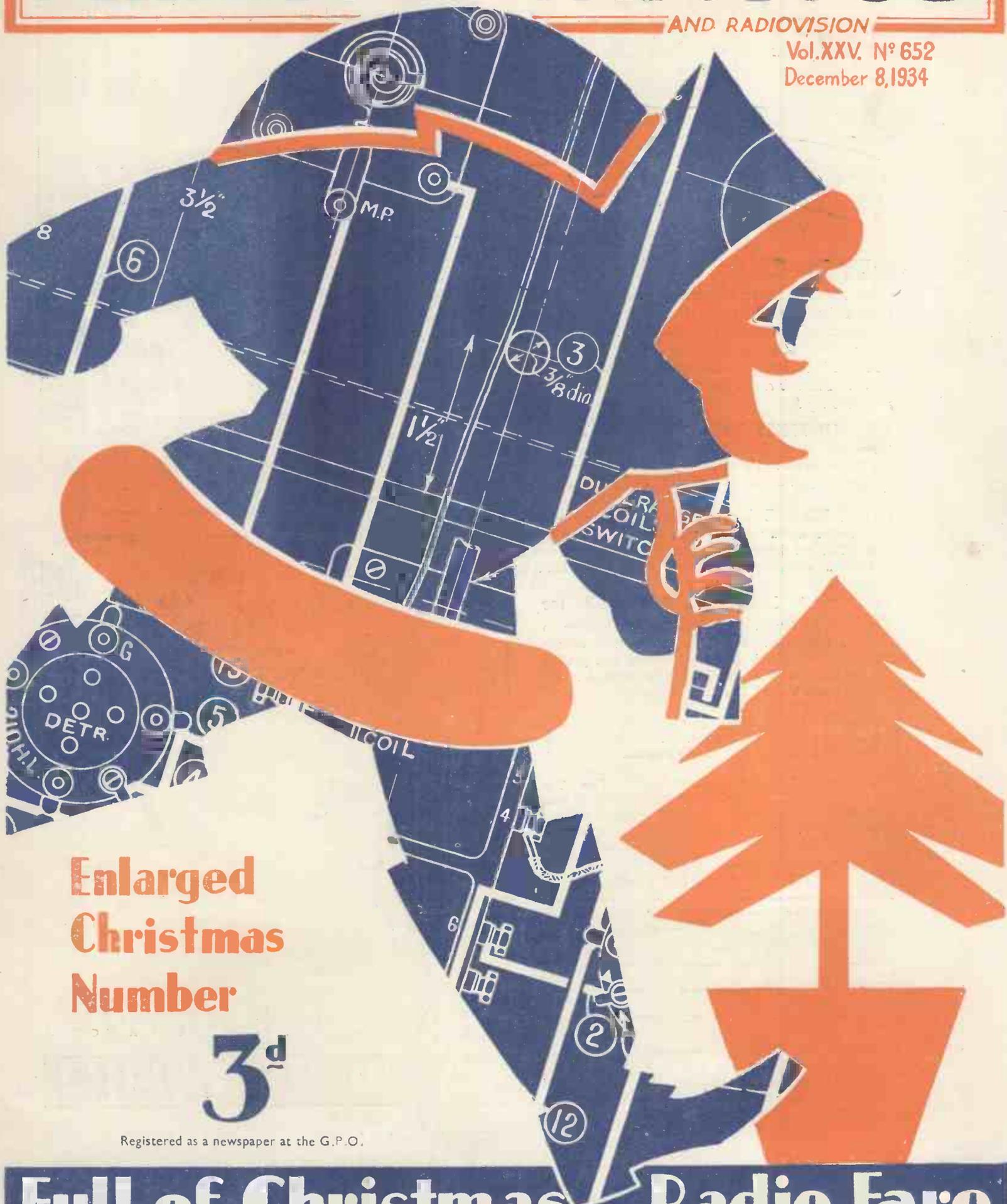


Amateur Wireless

AND RADIOVISION

Vol. XXV. N° 652
December 8, 1934



Enlarged
Christmas
Number

3^d

Registered as a newspaper at the G.P.O.

Full of Christmas Radio Fare

GET THIS FINE RADIOGRAM FOR CHRISTMAS

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What wonderful entertainment this beautiful "His Master's Voice" Radiogram offers you and your friends for Christmas! The pick of European broadcast programmes. Then Records! *Dancing whenever you want it*; variety stars; great orchestras; Paderewski playing; Chaliapine or Gigli singing; Gracie Fields larking—the world's greatest talent in your own drawing-room! *And this can be yours now, for 5/- a week! Ask your dealer for a demonstration to-day!*

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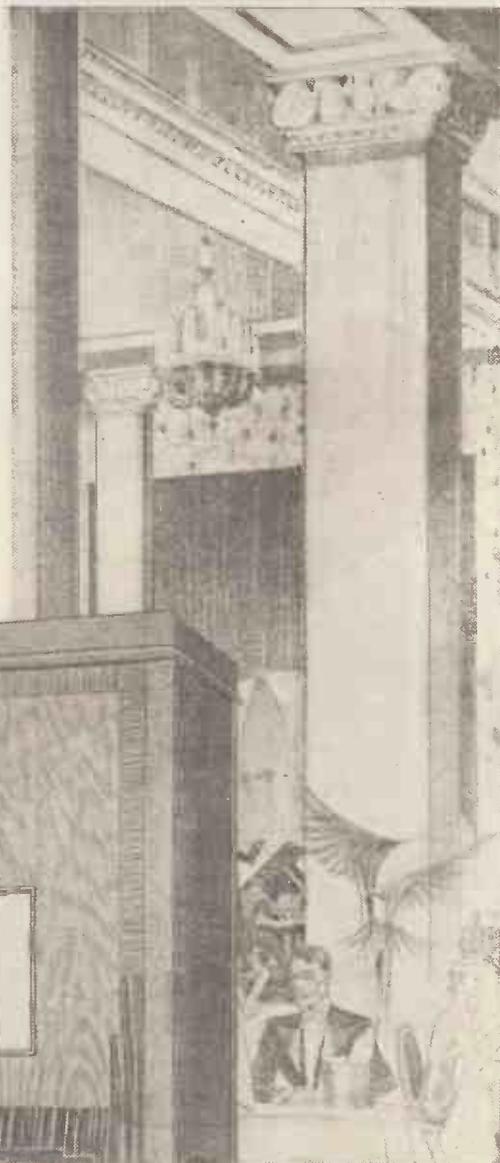
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ADDRESS

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8-12-34



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

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Radio Peace and Goodwill!

THE cheerily sparkling fire and the cosy armchairs in which we are seated round it give us all the comforts of home life; the loudspeaker in the corner of the room allows us to join in the merrymaking of the rest of the world without any of the discomfort of making a cold journey to do so.

That is our Christmas family party as we imagine it on Christmas Eve!

Dad quite looks forward to Christmas nowadays. It will give him a splendid opportunity of demonstrating his wireless set which, like everybody else's set, is considerably better than everybody else's set. It will be a treat to those relatives of his to have an opportunity of listening to a well-selected programme through a first-class receiver.

Good Accompaniment

Mum feels too that the wireless is an asset. A little soft music makes a good accompaniment to her tale of those awful people down the road who, despite general protests, still continue to hang their washing out in the garden every Sunday. With a musical background, the true drama of such tales becomes properly apparent.

Male guests also feel glad that they will be able to enjoy a radio Christmas. With wives shy of making a fuss in somebody else's house, husbands are likely to have more opportunity of searching for elusive foreign stations than is usually obtainable at home.

Of course, Dad's set will not be as good as their own sets, so it may be impossible to get any really worth-while stations. But then there will be the pleasure of making the man's mouth water by telling him all about the programmes that they listen to in their own homes.

That Bored Feeling

Female visitors feel that radio will help things along. By listening to it, they will be able to avoid the bored feeling that creeps over you when your hostess starts telling you about the sins of the people who live nearby.

There is a general feeling of relief that there will be a wireless set available, because Cousin Ethel, who sings, will be at the party, and people can't very well sing while the radio is going.

Even Cousin Ethel is not depressed by the thought of the wireless set for what a pleasure it will be to everybody, she

reflects, to have the Real Thing after an overdose of canned music.

In fact, wireless gives every promise of adding to Christmas a brightness which was lacking in pre-wireless days.

But what a tragedy it is, thinks Dad on Christmas Day, that the foolishness of the rest of mankind robs us of the benefits which science hands to us! Here is he, good-naturedly trying to give everybody a rich musical and scientific treat, yet all they do is to sit there looking as they do when Cousin Ethel sings to them. And they won't be even as tractable as that for long!

That brother-in-law of his is already sidling across towards the wireless set. It is ridiculous the way some men are never content unless they are doing the knob-twisting themselves!

However, the brother-in-law, having with polite Christmas-like apologies gained control of the set, is not really content. For his skill at picking a delightful programme to please everybody is cramped by his knowledge of the vulture-like attitude of the other men.

His host and the rest of them are, he knows, hovering round, waiting for a chance to pounce on him.

And before long they do. None of them, however, feels really happy.

Suddenly all the men realise how intensely pleasurable their occupation has been. For feminine protests threaten to put a stop to it. "We simply can't hear our own voices! Do, for goodness' sake, make it quieter and put it on to something that's worth listening to!"

Furtive Volume Control

Then the men cluster round the quietened loudspeaker so that their wives' voices shall not be entirely drowned in their murmur. But, from time to time, one of the men half hears from the other end of the room a libellous statement; something about the unreasonable amount of darning that his socks require or the damage that he does to the knitting needles when he uses them as pipe cleaners. Before he walks over to make his protest, he furtively turns the volume control a little higher so that he shall not be entirely out of range of the loudspeaker when he gets to the other end of the room.

After this has happened several times, feminine influence silences the wireless altogether.

And then Cousin Ethel's singing is, of course, inevitable! But the enthusiasm does not come up even to the level of pre-wireless days, or the men are so busily planning to walk unobtrusively across the room to switch on the wireless

directly the girl shows any signs of stopping, and the women are so much on the alert to prevent the men from walking unobtrusively across the room that nobody remembers to show the poor girl the appreciation which the spirit of Christmas demands!

Knob-twisting Maniac

The number of delightful programmes that is broadcast on Christmas Day is astounding. Music of unbelievable beauty, almost forgotten melodies that you have been waiting for years to hear again, make a fleeting appearance out of the loudspeaker for just long enough to tantalise you; and then some knob-twisting maniac pushes you away from the set so that he can get silly noises out of it!

But don't for a moment get the impression that it is unwise to try to combine radio with your Christmas festivities. On the contrary, the final result is delicious calm and contentment. For, with Christmas over, you realise what a delightful luxury a wireless set is when there are no interfering fathheads in the house to spoil the pleasure!

R. A. S.



Naughton, Jimmie Nervo, and Billy Carlyle, members of the famous Crazy Gang, having a spot of fun at the Variety Ball held recently at Grosvenor House, London. A foretaste of Christmas!

News from Broadcasting House

New Aerial for Droitwich?

SOMETHING ought to be done about—Droitwich, this time. Listeners are asking what the B.B.C.'s plans are for counteracting the fading and night distortion.

The answer, in the words of a bland official, is short but inconclusive—"we are investigating."

Is It Seasonal?

ACCORDING to the engineers, who ought to know, the fading and the associated night distortion are due to a seasonal effect that has been noticed for some years on the Daventry transmissions.

Every week, says the B.B.C., there is an improvement in Droitwich reception.

The pity is that Droitwich began just when the seasonal effect was due to make itself a nuisance. As a result, the big station has not earned quite the number of bouquets anticipated by its sanguine designers.

That Upward Ray

TROUBLE seems to be that the upward ray of such a powerful transmitter as Droitwich tends to accentuate the seasonal effect—tends to make the fading and night distortion at radii of from 150 to 250 miles much more pronounced than with the old 35-kilowatt Daventry plant.

Remedy? See what other countries have done—notably America and Germany. They have erected special anti-fading aerial systems, designed to restrict the upward ray—to shoot it off at a low angle, thereby putting the fade point beyond the normal service area.

It Would Be Costly

IN theory, the B.B.C. admits, such an aerial might appreciably reduce the present Droitwich trouble—although they rightly say that as the seasonal effect is waning any new aerial would earn unfair credit.

And, added to that, they point out that a new aerial mast system of the anti-fading type would cost anything from twenty to thirty thousand pounds—phew!

Waiting a While

BEARING all these facts in mind, it is not surprising that the B.B.C. has decided not to make any move for another few weeks. By the end of say a month they will know just how they stand on the seasonal effect.

They will know whether the remaining fading and night distortion is still appreciable. If it is, why then someone will have to fork out quite a few pounds to put the matter right.

Empire Experiments

TALKING of aerials, they are also trying out vertical and horizontal systems at Daventry for Empire transmissions.

As with Droitwich, the seasons have a lot to do with the efficiency of propagation—and it is thus slow work waiting for every condition to arise for each type of aerial.

By the way, the old 5XX aerial is now coming down to make way for still more Empire aerials arrangements.

Odious Comparisons

OFTEN enough we hear from listeners in distant parts telling of the superiority of continental short-wavers as compared with the Daventry Empire stations.

Perhaps it is not realised that

More Money Wanted

IF the Federation of British Industries has its way, the Treasury may see fit to allot more of the licence revenue to Empire programmes.

At Broadcasting House the feeling is that more money would be spent on this service if it could be obtained. Those responsible are doing all they can with somewhat meagre means.

Not So Impressive!

BACK from their wanderings in Germany and America the members of the P.M.G.'s Television Committee are now settling down to prepare their eagerly awaited report.

It should be ready for publication early in the New Year. Unless rumour lies some of the foreign systems examined were

so much so that four new engineers have been taken on. We don't envy them some of the tricky jobs ahead.

Full of Snags

LIFE for the "O.B." men is just one darn thing after another. They get everything fixed for a dandy relay of a band and then move on to another job.

Meanwhile, the well-meaning band conductor shifts round all his players—and the microphone hanging from a fishing rod to pick up the strong gets an earful of the heavy brass.

Then the O.B. men start all over again. And so on!

For Christmas Day

SOMETHING very special in dramatic-control panels has just been erected in one of the fifth-floor listening rooms at Broadcasting House.

It will handle no less than fifteen channels—instead of the usual maximum of eleven.

Some of these will be for outside points and all fifteen will be in use for the Christmas Day programme at 2-o'clock in the afternoon.

His Majesty Again

ONCE more we shall have the pleasure of hearing the King's voice in the Christmas Day programme.

He will speak as before from his study at Sandringham House, Norfolk. Four circuits will connect the house to Kings Lynn telephone exchange and the best at the critical moment will be actually used for the relay of his Majesty's voice to London.

Most Complex

WE gather that Australia, New Zealand, Tasmania, South Africa, India and Canada will all take part in the great Christmas Day programme—which the O.B. department regards as the most complex it has yet attempted.

Moscow Expands

ON the site of a proposed cathedral never completed, the Russians are now building a new Broadcasting House, using the thick walls already erected as effective sound insulators between the studios.

Television, plays and large orchestral studios are going up.

Lew and Billy

ON Christmas evening, Lew Stone and Billy Cotton will share the honour of playing our dance music.

There will be dance music from 9.40 p.m. until midnight—so send out those invitations to the domestic hop in good time.



Stanley ("Pick Up the Musket") Holloway and Jack Barty in a scene from "In Town To-night"—a new British Lion musical now in production at the Beaconsfield studios

the continentals usually broadcast a narrow beam to cover a fairly restricted area—whereas the B.B.C., with only two stations at any given time, has to cover a much wider service area.

No More Asides

WHAT a pity the B.B.C. has seen fit to put a ban in future on the relaying of after-dinner chatter from the tables.

This follows the slight embarrassment at the asides picked up by the microphone during the recent Guildhall banquet.

Only the Hum

IN future, therefore, the chance remarks that lent a little humanity to the proceedings are to be dimmed.

All we shall be allowed to hear is the hum of conversation—a soporific we could do without.

not so impressive as has been made out.

"Orion" Launch

AFTER all the false alarms, the Orion launch will be relayed by the B.B.C. on Friday.

The Post Office has fixed the lines and the B.B.C. has decided that, although the quality may not be up to the usual high standard, it is good enough for broadcasting.

It should be a good show. The Duke of Gloucester, you recall, is to launch the Orion by remote control from Australia.

More "O.B." Men

WHAT with shows from St. Georges Hall, from the No. 10 studio and other relays around London, the "O.B." department is rather overworked at the moment.

Christmas Radio Wherever You Go!

Here the "A.W." Technical Staff Presents Details of the

GOODWILL THREE

for Battery Operation
and the

GOODWILL TWO

for A.C./D.C. Mains

Both are Completely Self-contained and Transportable



Here's to Christmas, 1934—and we hope you enjoy yourself as much as these jolly listeners appear to be doing. The set in the middle of things is the Goodwill Three

At no time of the year is radio so much appreciated by the family as at Christmas. As each year goes by, the average home seems to depend more and more on the broadcasters to supply it with entertainment during leisure hours.

Radio seems to have taken the place of the conjuror, the charades, and, indeed, most of the formalised types of fun and games beloved of our ancestors.

Lazier?

Perhaps it is that we are growing lazier in our amusements. Certainly radio offers a practically effortless means of idling away holiday hours—unless twiddling a knob can be called an effort.

There is really no need for us to labour this function of the radio at the festive season. As a reader of this paper you are already aware that what we have said is true.

Possibilities

Granted that radio now provides an indispensable background to Christmas activities, we have to ask ourselves whether we are really fully equipped with the necessary installation to do justice to the illimitable possibilities of radio entertainment.

Is that standard set ideal for the job? Or does the occasion warrant something specially designed and constructed? Not for a moment are we asking you to scrap a perfectly good set in favour of the designs presented to you herewith. On the contrary, we suggest that possibly an auxiliary set—an extra, in other



Although we don't claim that the Goodwill sets are hikers' companions, we emphasise that they are entirely transportable

You may say that an extra loud-speaker is all that is wanted—but is that quite true? Isn't it asking rather much of a party to expect them all to want to listen to the same programme? The young ones will want the dance music and suchlike broadcasts, whereas the older and more staid members of the party may prefer something a little more tangible.

Then, again, you may be going away to friends or relations this Christmas, and be sighing because you will miss your favourites

words—might be a very good idea.

Especially as such a set can be assembled with the minimum of expense; and at the same time provide an invaluable aid to Christmas enjoyment.

What we have in mind is a set essentially more mobile than the normal installation. Portables, as such, have lost favour because they are not portable. There remains the great advantage of self-containedness in so-called portables—or transportables as we prefer to call them.

A self-contained battery or mains set has very wide advantages for Christmas functions. With friends overflowing from the living-room in the "best" room or parlour, an extra set is all too often wanted.

over the air owing to the lack of a good installation at the holiday venue.

To take a neat set with you, then, is a solution—assuming that the friends or relatives do not belong to the small class that "cannot abide the wireless."

It all comes to this: The Christmas season ahead of us makes big demands on the existing installation, which, under many conditions, may not be able to fulfill all the calls made upon it.

Wealth of Entertainment

It is therefore up to you to provide yourself with equipment that will obviate these difficulties—and that will materially add to the wealth of entertainment that can undoubtedly be derived from this coming Christmas's programmes from home and foreign stations.

We have been working out suitable designs for you for some time, having finally arrived at what we imagine will prove to be an arrangement of wide appeal. The basis of the design is a completely transportable set for local-station reception; this to be available in either battery or mains versions.

A simple detector and low-frequency amplifier circuit has proved sufficient for the purpose, even when working from the self-contained frame aerial.

The fields strengths of modern broadcasting stations, at least after dark, are now very great. With



One of These Sets Is Just What You Need for Xmas!



From this front view of the Goodwill Three you can see that the control is simplified. Note also the full-vision tuning scale, which is wavelength calibrated

but its advantage of utter self-containedness is real.

To make it so, the aerial and earth are replaced by a frame aerial, the windings of which are wound round a wooden framework—supporting the set, the loud-speaker, and housing the batteries.

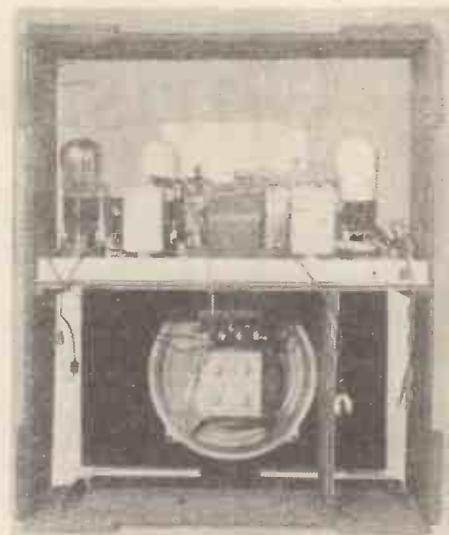
A point that will appeal to all keen constructors is that the complete hook up can be fully tested out before it is inserted in the cabinet. The framework with all its subsidiary parts is entirely independent of the cabinet.

This facility will be greatly appreciated by most constructors.

Question of Sensitivity

At first sight it may be wondered how a simple detector and low-frequency amplifier circuit can be made sensitive enough to give loud-speaker results with a frame aerial. We would remind readers that the amplification factors of modern valves are very much higher than they used to be in the old portable-set days. Moreover, we certainly must not forget that stations are of very much higher power than they were two or three years ago. This combination of circumstances results in an entirely different attitude towards design.

Then it may be asked how we obtain sufficient selectivity from one tuning circuit to cope with the admittedly difficult conditions in the



How the Goodwill Three looks when the metal baseplate and the loud-speaker have been placed into the wooden framework. Note the ample space for the batteries below

PARTS NEEDED FOR THE GOODWILL THREE (BATTERY TRANSPORTABLE)

BASEPLATE

1—Aluminium, 18 in. by 7 in. by $\frac{1}{8}$ in.

CONDENSERS, FIXED

1—T.C.C. .0003-microfarad, tubular type (or Dubilier).

1—T.C.C. .0002-microfarad, tubular type (or Dubilier).

1—T.C.C. .001-microfarad, tubular type (or Dubilier).

1—T.C.C. .01-microfarad, tubular type (or Dubilier).

2—Formo 2-microfarad, screened paper type.

CONDENSERS, VARIABLE

1—J. B. Popular Log, .0005-microfarad.

1—Graham Farish, .0005-microfarad type reaction (or J.B.)

CHOKE, HIGH-FREQUENCY

1—Wearite screened, type HFP.

DIAL, SLOW-MOTION

1—Wilkins and Wright, single ratio type W346.

HOLDERS, VALVE

3—Telsen 4-pin baseboard mounting (or Benjamin).

PLUGS, SOCKETS, ETC.

5—Clix wander plugs, marked G.B.—1, G.B.—2,

G.B.—3, H.T.—4, H.T.—5 (or Goltone).

7—Clix insulated sockets.

1—Clix metal socket.

7—Clix plugs.

RESISTANCES, FIXED

1—Graham Farish Ohmite, 1-megohm (or Eric,

Franklin).

1—Graham Farish Ohmite, .5-megohm (or Eric,

Franklin).

1—Graham Farish Ohmite, 20,000 ohms (or Eric,

Franklin).

1—Graham Farish Ohmite, 30,000 ohms (or Eric,

Franklin).

1—Graham Farish Ohmite, 10,000 ohms (or Eric, Franklin).

SWITCHES

1—Wearite rotary switch, type I22.

SUNDRIES

2—2-inch metal mounting brackets.

Connecting wire and sleeving (Goltone).

32 yards Goltone 9/40 Litz wire.

2 oz. of Goltone 30-gauge double cotton covered wire.

2—Bulgin No. 5 type grid-bias battery clips.

2—Bulgin 2-volt .06 ampere dial lamps.

2—Bulgin knobs, type K14.

1—Bulgin knob, type K12.

2—Bulgin reducing sleeves, 3/16th.

2 yards thin flex (Goltone).

TRANSFORMER, LOW-FREQUENCY

1—Ferranti, type AF10.

ACCESSORIES

CABINET

1—Kehtex, type BWD.

BATTERIES

1—G.E.C. 120-volt, type L255.

1—G.E.C. 9-volt grid-bias battery.

1—Exide type DIG accumulator.

LOUD-SPEAKER

1—W.B., type Stentorian Baby.

VALVES

1—Cosor 210HL met. (or Record Radio H2, 362 HL2).

1—Cosor 210Det met. (or Record Radio L2, 362 L2).

1—Cosor 220P (or Record Radio P2, 362 LP2).

either to-day. Here, again, the general trend must not be lost sight of. We no longer necessarily build all our sets to log fifty or sixty stations, being much more concerned with building a set that will give us a reasonable number of *alternative programmes*.

Say a dozen high-power foreigners at the minimum and you have that reasonable number of programmes available even on such a simple circuit as this. Add to the well-known selectivity effect of reaction the directional properties of the frame aerial and you have enough to go on with.

Under-estimating Capabilities

By dubbing this a local-station set we know that we are under-estimating its tested capabilities. We would sooner do that than lead you to suppose that the world is at your feet with a detector, no matter how efficient, and a couple of low-frequency amplifying valves.

Perhaps it will be best to deal with the two designs separately, so we will begin with an analysis of the circuit and layout of the battery version.

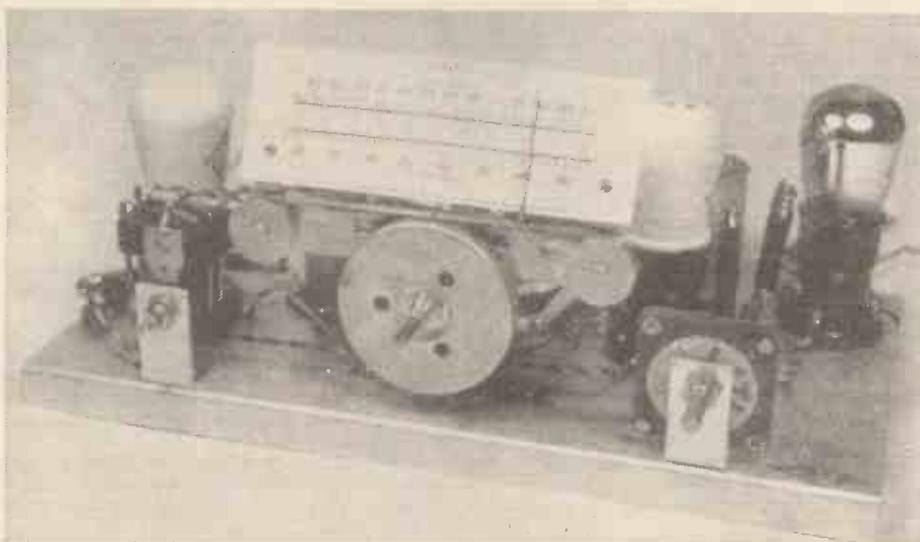
If you look for a moment at the theoretical circuit diagram you will see one very important thing: the frame windings are shown in the form of coils—numbered connections being marked from one to six. There is a reason for this.

the simplest of circuits, provided that they have a fair measure of selectivity, it is now possible to put at least a dozen stations on to the loud-speaker with good volume.

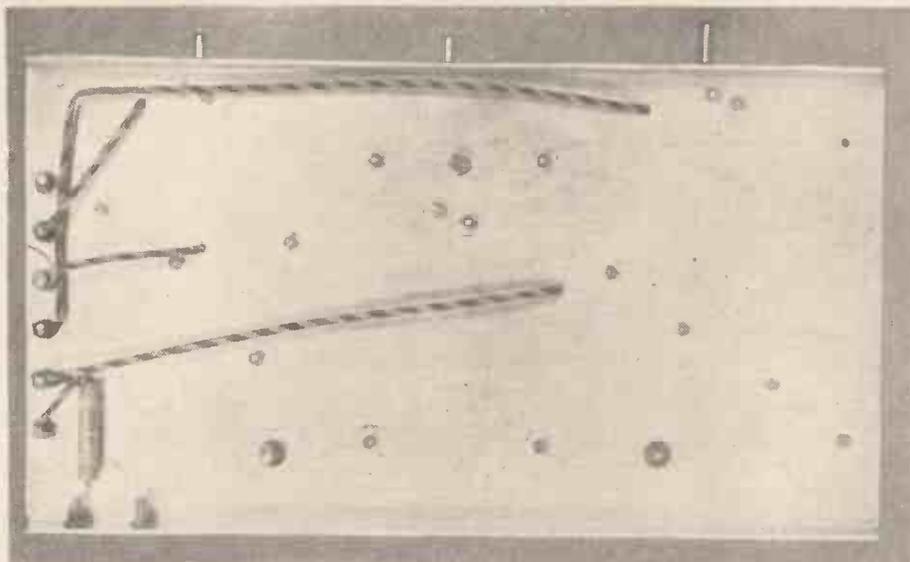
So that, although it is called a local-station set, the transportable described and illustrated in these pages is in reality more than that. Even under the most adverse conditions it should be quite easy to log the round dozen foreigners suggested—and with a little care in knob-twiddling, many of you will greatly exceed that number.

The mains version, which can be used on either A.C. or D.C. supplies without any alteration in the wiring, is slightly different. We will deal with the individual differences later.

For the moment, a few more broad design points. The sets are complete in themselves, remember. Nothing is needed external to the cabinet. A handle on the top enables this cabinet to be carried from room to room with ease. We don't suggest that the weight is low enough to make the set a hiker's companion—



How the Goodwill Three looks from the front when the valves have been inserted. A metal baseplate set, with practically no sub-chassis wiring or components



We said it was simple underneath—and this picture proves our point! Just the aerial series condenser and one or two of the lengthy leads—that's all



Looking from the back of the metal baseplate of the Goodwill Three you gain a good idea of the layout. Note the aerial and earth connections on the right of the baseplate

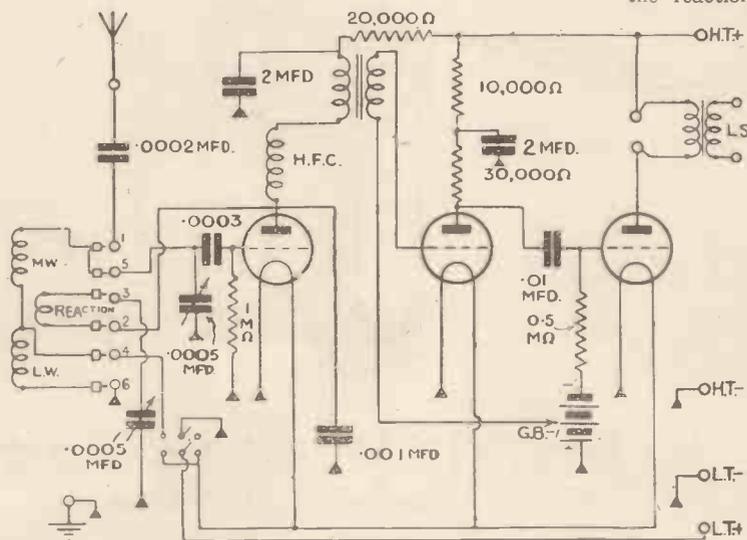
high-frequency choke between the anode of the detector and the primary of the low-frequency transformer.

This primary is, on the other side, well decoupled with the usual 20,000-ohm resistance and 2-microfarad fixed condenser. Similarly, the anode circuit of the second valve is decoupled with a 10,000-ohm resistance and a 2-microfarad condenser to earth.

Switching

As for the rest of the circuit, perhaps the only other point needing comment is the switching. There is a double-pole double-throw switch for the wave-changing and battery "on-offing." This is a convenient type of switch for such a set, with a centre "off" position.

Then, when it is switched anti-clockwise the medium waves are brought in, at the same time the filament circuit



Theoretical circuit diagram of the Goodwill Three, showing the detector with reaction, transformer-coupled low-frequency stage and resistance-capacity-coupled power output—all triode valves, note

being connected by the lower section of the switch. When switched to the clockwise direction the filament circuit is likewise completed, but here the long waves are brought in by the series connection of the two windings.

Earthed Chassis Points

At first sight you may not be able to see how this is done, because for simplicity we have marked all earthed chassis points with small black triangles. You must visualise all these little triangles joined together to get a fair idea of the circuit arrangement.

For medium waves the long-wave coil or frame is shorted to earth, whereas for long waves this winding is brought into series with the medium-wave winding—the 0.005-microfarad variable tuning condenser being in parallel whichever arrangement of windings is involved.

Just one other circuit point. The circuit shows a transformer between the anode circuit of the power triode and the loud-speaker. This is not a set component, as the transformer is built into the loud-speaker chassis fitted to the front part of the frame work.

All else is perfectly simple to follow, and we won't waste any more space detailing the components not mentioned—save to ask you to stick to the values specified. They are best for this set.



Full-size Blueprint

When you come to the construction of the battery model you certainly must take a look at that blueprint, for it includes not only the layout of the set chassis, but also gives the various arrangements of frame, loud-speaker, batteries, and so on.

As can be seen, the basic layout is a metal baseplate—not a chassis in the full sense of the word, although the mains version certainly is.

As many as possible of the components have their negative connections taken direct to the nearest earthed part of the metal baseplate and the saving in wiring alone justifies this form of construction.

Note that the large tubular condensers have only one connection—at the top—the other being made automatically to earth as they are fixed to the metal baseplate.

Similarly, there is only one connection for the reaction condenser and for the tuning condenser, the earthed connections being made to the metal brackets fastened to the baseplate. All this saves wiring and worry—as does the use of a metal socket for the earth connection, which is made straight to the back lip of the baseplate. The aerial terminal is, of course, insulated.

Negative Points

All the negative filament terminals go to nearest bolts holding the components to the chassis. This point is made clear by the full-size blueprint, which in a set of this type is invaluable.

About those two dial lights. The negative sides go to the fixing bolts at each end of the scale. The bulb holders, you will find, are adjustable. Get them just right, so that the calibrated scale is evenly lighted when the set is switched on. The fixing wires hold these

Continued on page 593



The battery that
will give you
**BETTER
RADIO
THIS XMAS**

PRICES: 99v: 9/- 180v: 10/- 120v: 11/-
60v: 5/6 139v: 12/9 150v: 14/- Also
124½v: 11/6 60v: 8/6 120v: 17/6

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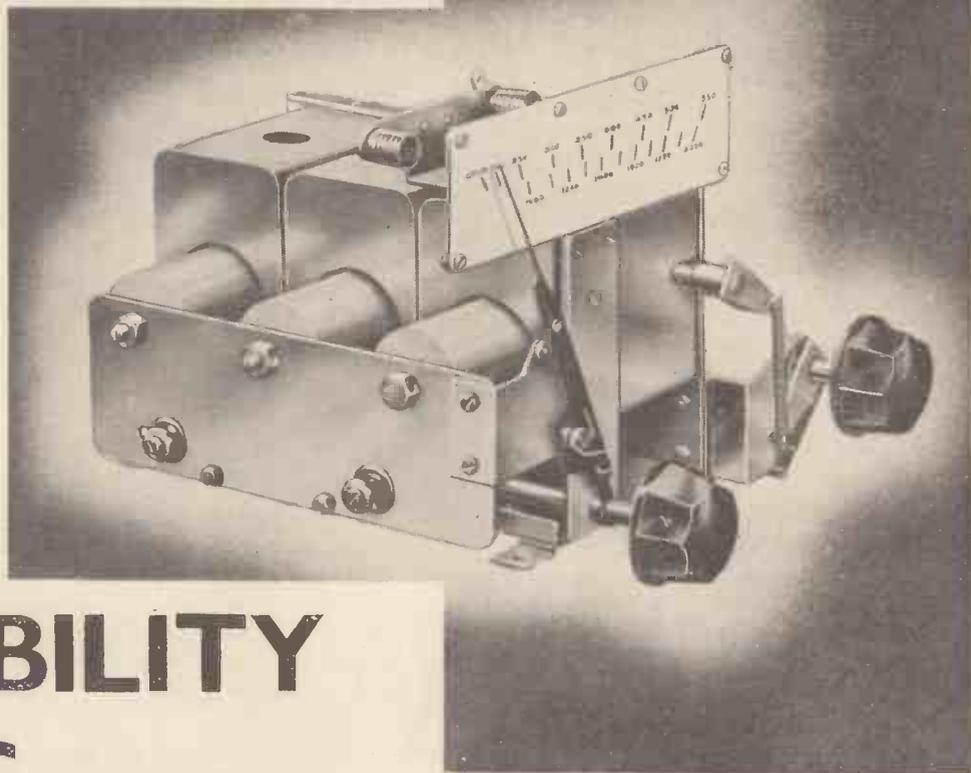
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PERMEABILITY TUNER

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PERMEABILITY TUNING

a new tuning system
that will greatly improve
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Varley

(Proprietors: Oliver Pell Control, Ltd)

Permeability tuning is here—
Varleys great improvement on
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denser tuning that has held
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What a difference it could make
to your set—giving you better
radio entertainment than you
have ever had before.

Be one of the first to use
this great new Varley tuner.

Write for full information today.

Christmas Radio Wherever You Go!

Continued from page 590

bulbs in position once they have been adjusted to suit. By the way, these bulbs take .1 ampere each—so perhaps you will prefer to forego the luxury of an illuminated scale if the drain on your accumulator is too great.

Only one or two long wires are underneath the baseplate, and the only component under there is the aerial series condenser. All else is clearly shown above board.

Working Outside the Cabinet

A good feature of the set's design, as already hinted, is the easy way the completed job can be tested under working conditions before it is inserted in the cabinet.

The batteries can, therefore, be connected up, by inserting the grid bias in the clips provided at the top of the framework, leaving the larger compartment below for the 120-volt high-tension battery, and the smaller compartment for the 2-volt accumulator.

For the present we will not go into any more details of this set, although there will be more for you in next week's issue. Meanwhile, it is worth noting that the frame windings have been designed to provide some sort of accuracy in the dial calibrations.

In other words, the windings have been fashioned so that when the scale says, say, 350 metres, the winding and condenser in circuit will be tuning to that wavelength.

This does not apply so well when a coil is used—but, then, the use of a coil is in the nature of an alternative to the main specification.

When we come to examine the mains version, we find that there is a completely different line-up of valves, although the main constructional outline—never fear!—is much the same as for the battery job!

From the circuit diagram it will be seen that there is first a high-frequency pentode, which is transformer coupled to an output pentode. Thus the mains version is only really a two-valver—but a very powerful one.

Because it was desired to make the mains model of the universal type a half-wave rectifier has been used for the A.C. conversion, so that when the set is used on D.C. this allows the current to pass through.

The input arrangement to the high-frequency pentode detector is precisely as for the battery job, so that we need not mention any more about that. This first valve, by the way, is a 13-volt .2-ampere valve of very high efficiency.

It has a resistance in its anode circuit, with full decoupling into the bargain. Then there is a feed condenser from the anode to the primary of the low-frequency transformer. It is parallel-feed coupling, with perfectly standard connections.

Note especially that the cathode resistance for the pentode output valve has been chosen to suit this valve. On no account try to work the valve with any other value.

The pentode in the output circuit is another prodigious worker. It has a 35-volt filament, passing .2 ampere as for the detector.

Note.—As the valves are in series the voltage rating of each filament does not matter so long as the current passed by them is the same.

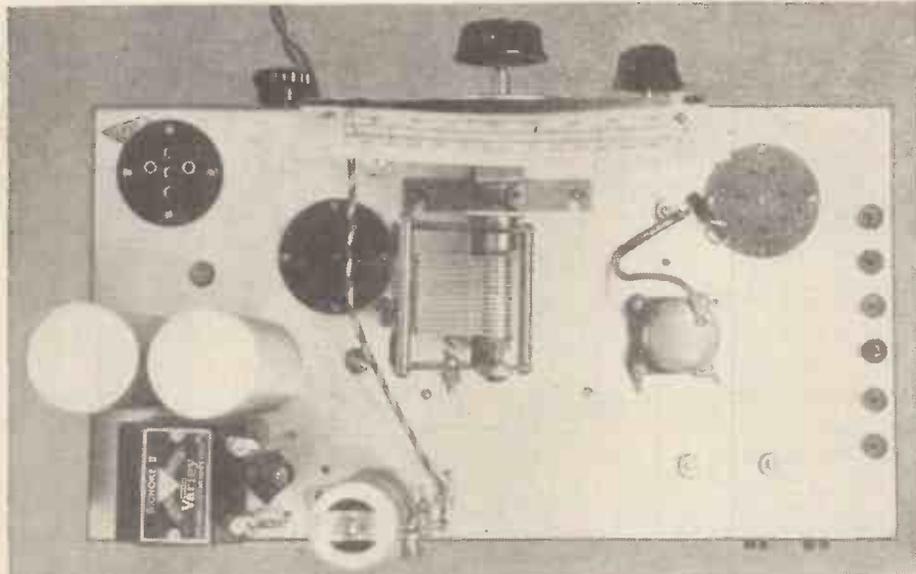
A maximum undistorted power output of 4,400 milliwatts can be obtained from the pentode output valve—a condition that is fulfilled only when the strong locals are brought in, but it shows there is plenty of power in hand.

Then about the rectifier. This has a 40-volt filament just to complete the variation—but again its current is .2 ampere.

These valves have their filaments wired in series with a tapped resistance and the mains input. Also the two bulbs for the scale lighting are wired in this series arrangement.

The smoothing is done very simply with a couple of 8-microfarad electrolytic condensers and a series 30-henry choke passing 60 milliamperes. The position of the smoothing can be clearly seen.

Lastly, there is a small difference in the switching. This is necessary owing to the mains supply. There is a three-pole



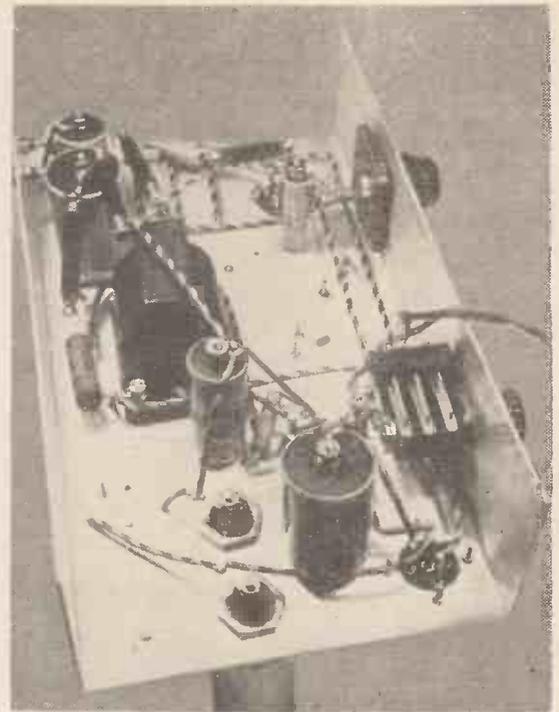
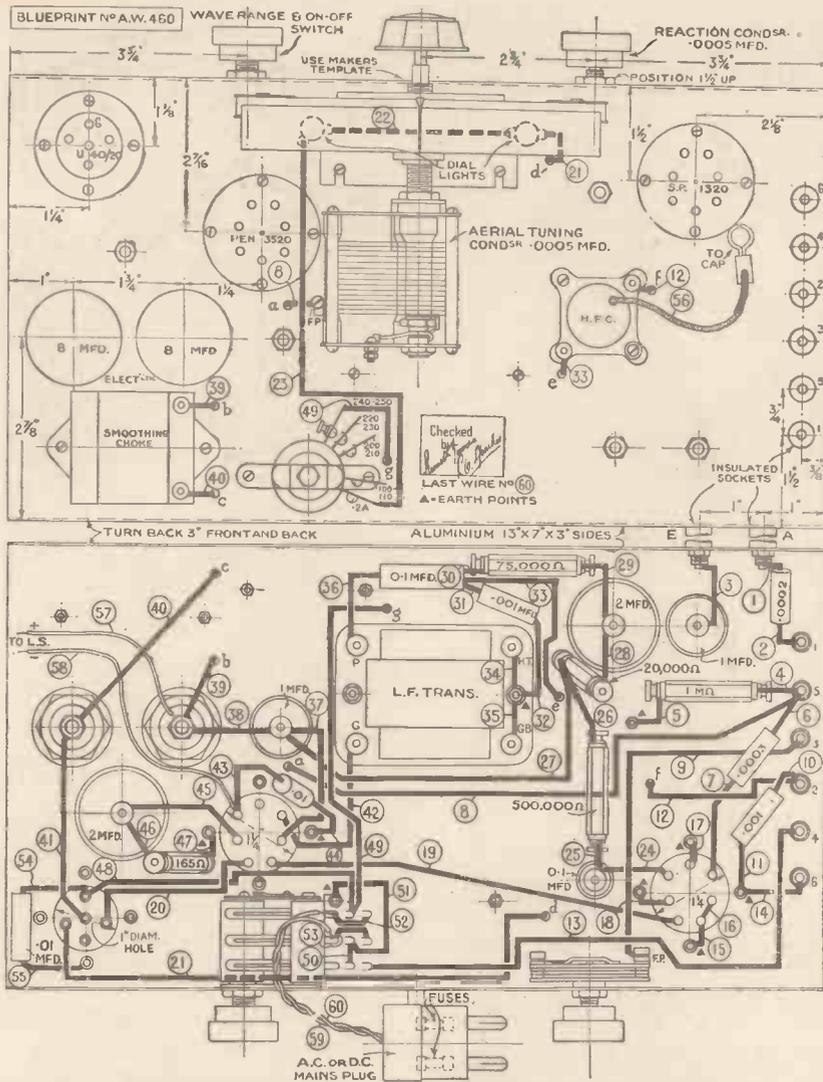
Plan view of the Goodwill Two—a universal mains set built upon chassis lines, with some of the components above and the rest below the main baseplate

PARTS NEEDED FOR THE GOODWILL TWO (AC/DC TRANSPORTABLE)

- CHASSIS**
 - 1—Aluminium, 13 in. by 7 in. by 3 in.
- CONDENSER FIXED**
 - 1—T.C.C. .0002-microfarad, type tubular (or Dubilier).
 - 1—T.C.C. .0003-microfarad, type tubular (or Dubilier).
 - 2—T.C.C. .001-microfarad, type tubular (or Dubilier).
 - 2—T.C.C. .01-microfarad, type tubular (or Dubilier).
 - 1—T.C.C. .1-microfarad, type tubular (or Dubilier).
 - 1—Formo .1-microfarad, type screened paper.
 - 2—Formo 2-microfarad, type screened paper.
 - 2—Formo 1-microfarad, type screened paper.
 - 2—Dubilier 8-microfarad, 500-volt working, type electrolytic.
- CONDENSERS, VARIABLE**
 - 1—J.B. .0005-microfarad, type Popular Log.
 - 1—Graham Farish .0003-microfarad, type reaction (or J.B.).
- CHOKE, HIGH-FREQUENCY**
 - 1—Wearite type HFPA (screened).
- CHOKE, LOW-FREQUENCY**
 - 1—Varley Nichoke II.
- DIAL, SLOW-MOTION**
 - 1—Utility type W346.
- HOLDERS, VALVE**
 - 2—Clix 7-pin chassis-mounting.
 - 1—Clix 5-pin chassis mounting.
- PLUGS, TERMINALS, ETC.**
 - 8—Clix insulated sockets, (or Goltone).
 - 8—Clix insulated plugs (or Goltone).
 - 1—Clix top cap connector (or Goltone).
- RESISTANCES, FIXED**
 - 1—Graham Farish 1 megohm, type Ohmite (or Erie, Franklin).
 - 1—Graham Farish 500,000-ohm, type Ohmite (or Erie, Franklin).
 - 1—Graham Farish 75,000-ohm, type Ohmite (or Erie, Franklin).
 - 1—Graham Farish 20,000-ohm, type Ohmite (or Erie, Franklin).
 - 1—Graham Farish 165-ohms, type Ohmite (or Erie, Franklin).
 - 1—Bulgin for 88-volt .2-ampere.
- SUNDRIES**
 - 2—Bulgin pilot lamps 6-volt .2 ampere.
 - Connecting wire and sleeving (Goltone).
 - Thin flexible wire (Goltone).
 - Frame aerial wire, 30 yd., type 9/40. (Goltone).
 - 2 oz. 30 gauge D.C.C. wire (Goltone).
 - 1—Clix 2-pin 5-ampere fuse-plug.
- SWITCH**
 - 1—Wright & Weaire, rotary, three-pole double-throw, type 123.
- TRANSFORMER, LOW-FREQUENCY**
 - 1—Ferranti, type AF10.
- ACCESSORIES**
 - CABINET**
 - 1—Kebtex type BWD.
 - LOUD-SPEAKER**
 - 1—W.B. type Stentorian Baby.
 - VALVES**
 - 1—Mazda SP13/20.
 - 1—Mazda Pen 35/20.
 - 1—Mazda U40/20.



This back view of the Goodwill two-valver clearly indicates the position of the mains resistance, with the two electrolytic condensers for smoothing on the left



Underside view of the Goodwill Two, showing the mains and wave-change switch and reaction condenser on the control side of the chassis. Note, too, the large terminals for the electrolytic connections

Look Out Next Week for Further
 Constructional and Operating
 Hints on the
GOODWILL THREE
 and the
GOODWILL TWO

Reduced reproduction of the full-size blueprint of the Goodwill Two, which can be obtained price 1s. post paid from AMATEUR WIRELESS, Blueprint Dept., 58-61 Fetter Lane, E.C.4 Ask for No. A.W. 460 when ordering

change-over switch, arranged to cut out both the mains leads when neither long nor medium waves are in action. A condenser in the earth lead effectively prevents any mains leakage.

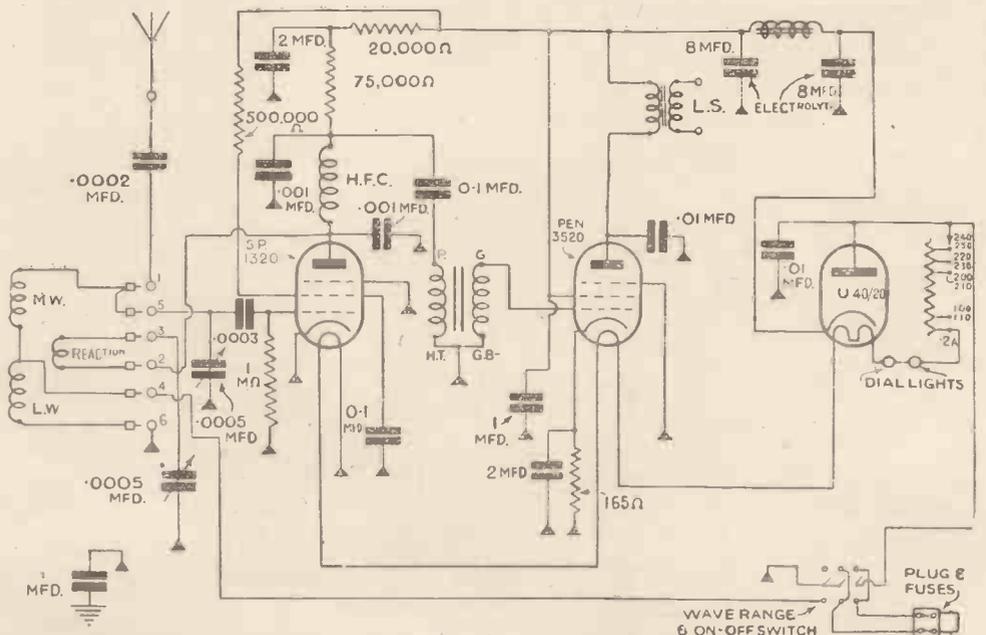
This universal-mains version will work on any A.C. or D.C. supply down to 190 volts and up to 250 volts. And that without any alteration to the wiring of the set, remember.

In the practical interpretation of this circuit we have resorted to a chassis-type construction; with some of the components below and the rest above the main baseplate. Underneath, for instance, are the low-frequency transformer, the decoupling components, the business ends of the electrolytics, not forgetting the connections for the chassis-type valve holders—two seven-pin and one five-pin.

Slightly Different Controls

Controls are a little differently arranged, too. The reaction and switching are reversed—reaction on the left and switching on the right.

One point we noticed about this set for universal mains working is that the valves heat up in 35 seconds—which is just about as quick as any A.C. set, in contrast to the one and a half minutes taken by many universal mains sets with other valves.



Theoretical circuit diagram of the Goodwill Two, which has a high-frequency pentode detector, transformer coupled to a power-pentode output valve. A half-wave rectifier supplies the high tension from the A.C. mains. Look out for further notes about this set next week

Mystery in France

By JAY COOTE

SOME mystery appears to surround the construction of the new high-power station which the French State is putting up at Thourie, near Rennes. There is no doubt it is to be one of, if not the most powerful of the French transmitters, but so far nothing very definite has been stated regarding its ultimate power.

Rumour in Paris now has it that the original plans have been altered to meet new requirements and that the broadcasting plant to be installed will eventually give an output exceeding that of Droitwich, in fact, more in the neighbourhood of 200 kilowatts.

New-type Aerial Pylon

For the aerial system a new type of pylon is to be used and its height will exceed 200 metres, roughly 660 feet. Rennes, as the crow flies, is about 185 miles from our southern coast, say from Bournemouth, so that such signals on 288.6 metres (1,040 kilocycles) are quite likely to wipe out any reception—over a wide area in that district—of transmissions on neighbouring channels.

As regards the B.B.C. programmes, listeners on the south coast will not be affected. The nearest British wavelength is 285.7 metres (Scottish National), which is not called upon to feed this part of Great Britain.

Moreover, when the new Midland Regional comes into operation, Scottish National will take over the London National channel, which is separated from Rennes-Thourie by 109 kilocycles.

Other Regional Changes

Other changes will be made at the same time. Midland Regional will leave 391.1 metres to work on 296.2 metres (the present North National allocation), and will hand over 391.1 metres to Scottish Regional. West Regional will adopt 373.1 metres and pass on its channel (307.1 metres) to the new Belfast high-power station.

Such changes, generally speaking, do not affect listeners with the exception that it means a slight alteration to the printed condenser scales. However, as and when new high-power transmitters crop up on the Continent, we may expect a readjustment of channels if severe interference is to be avoided. A certain amount of juggling in wavelengths is inevitable in view of the crowded state of the broadcasting band.

A correspondent who during the past week has been devoting entire nights to searches of U.S.A. stations, expresses his surprise at hearing the same items on so many different wave-lengths.

We speak glibly of American networks in conjunction with the N.B.C. and Columbia organisations, but few listeners realise the number of stations included in these systems. When the Columbia people from their WABC station "hook-up" for a special broadcast through their entire chain, they bring into action one hundred and two medium-wave transmitters, and in addition feed the programme to some short-wave outlets.

No wonder when you twirl the dials in the middle of the night you pick up the same

sponsored entertainment in many dial positions.

Budapest, without doubt, to most listeners with multi-valve sets, is one of their star stations nightly; it is the top reading with most receivers on the medium broadcast band, and except for spasmodic interference by morse from shipping, can be relied upon as a powerful signal.

The Hungarians now want an alternative programme and are hurriedly erecting their second capital transmitter. As its power will be 20 kilowatts, we may also get the benefit of the extra entertainment offered.

The same wavelength will be retained, namely, 227.1 metres (1,321 kilocycles), which is just above the channel used by the Frankfurt group of relays.

It is a pity there exists no definite policy regarding the announcements of foreign stations in respect to their call. All studios do not now give the name of the city from which the broadcasts emanate; in fact, there is a tendency to adopt a call which makes identification difficult unless the listener is in the know.

Two stations in France may be given as an example, namely Lille, which regularly terms itself *Radio P.T.T. du Nord*, and Radio Vitus hidden behind *Poste de l'Île de France*. Generally speaking the Germans make the matter quite clear, although Königswusterhausen camouflaged as *Deutschlandsender* may still prove a puzzle to some people.



Listening with pleasure to Ekco model 65 six-stage super-het

Rome, on the other hand, has so far extended its call that it might be taken for an announcement of items in the programme. I picked it up the other night when the announceress "spilt a bibful" in this fashion: *Eh Yah! Radio Roma, Napoli, Bari, Torino secondo c Milano secondo*, the four last words indicating that the programme was being simultaneously broadcast by both Turin No. 2 and Milan No. 2.

Prague's Network

Prague also reels off all the names of the stations in its network, as does Warsaw for such transmissions as news bulletins and so on.

It is a pity that some arrangement cannot be made to induce the foreign stations to give out their calls in several languages as is customary with Budapest; it would be of great assistance to foreign listeners.

My Short-wave Log

By J. GODCHAUX ABRAHAMS

WITHOUT doubt, the new Rome (I2RO) station on 30.67 metres (9,780 kilocycles) is a vast improvement on its forerunner working on 25.4 metres. The wavelength chosen has been found more favourable and in addition the power of 20 kilowatts is also making itself felt.

So far, there has only been a skeleton schedule of broadcasts, but the best time to find them is G.M.T. 2330 on Mondays, Wednesdays, and Fridays.

Many tests are being carried out also on other nights, as I have heard Italian transmissions on 30.1 metres (9,966 kilocycles) probably through IRS, Torrenova, and on 30.52 metres

(9,830 kilocycles) which I believe is the IRE station in the same locality.

For the I2RO broadcasts the Italians are authorised to use a number of channels of which I gave the complete list in *AMATEUR WIRELESS*, issue October 6 last. Of these they have favoured 30.67 metres (9,780 kilocycles) and also 49.3 metres (6,085 kilocycles), which may be adopted for their night broadcasts of special entertainments to the United States. You may, however, until all four transmitters are in full operation, find them on some of the other channels mentioned.

German Push

In the same way, Germany is pushing on with the building of her 50-kilowatt short-wave stations at Zeesen. Tests have already been carried out of the DJA programme on 31.38 metres and through DJN on 31.45 metres (9,540 kilocycles) and also with DJC on 49.83 metres, and through the new channel DJM on 49.35 metres (6,079 kilocycles).

The other wavelengths on which experiments are to be made are DJR, 19.56 metres, DJQ, 19.63 metres, DJP, 25.31 metres and DJO, 25.43 metres.

FREE XMAS PRESENTS FOR LISTENERS

CHRISTMAS numbers are in the air just now. We have ours—and our contemporaries are making equally gallant efforts to interpret the festive spirit of the season. The Friday, December 7, issue of "Radio Pictorial" is a real bumper number, crammed with seasonable articles and stories.

A. J. Alan, the inimitable raconteur of the B.B.C., has written a story that will appear in "Radio Pic." first

of all papers after its broadcast. In addition, there will be features by many well-known broadcasting stars, including Henry Hall and Christopher Stone.

Then, too, you will find no less than 80 dozen 10-in. records and £25 in cash as prizes in a simple competition of radio star "jumbles."

These will make useful prizes for your friends—unless you decide to make a present to yourself!



Is she rehearsing for the party? Or learning a radio dancing lesson? Anyway, with a set like the Marconiphone, 257 four-valve battery model, as shown in the foreground, you can have lots of fun this Christmas

"Mr. Mike" at the Party!

By PETER SHIPLEY

One other point: Keep the loud-speaker-cum-microphone away from the loud-speaker proper. Otherwise there may be what the telephone engineer graphically describes as "singing round the ring." A sort of acoustic interaction that spells howls.

Carbon Mike

Possibly you are not content with such a makeshift arrangement for your microphone equipment. If that is so, a carbon-type "mike" can always be purchased quite cheaply. It needs a little more doctoring, of course.

As a rule, a microphone transformer will be wanted. The secondary, as shown by Fig. 2, will go direct to the pick-up terminals of the set—to the input of the detector valve, that is.

In the Primary Circuit

An energising battery will probably be needed in the primary circuit of this transformer. The microphone is connected in series, therefore, with the battery, the primary and rheostat and an on-off switch.

All this is clearly shown by the Fig. 2 diagram, but, of course, values will depend very much on the particular microphone

FORGIVE me if I seem to be reviving what the French would call "old game." Christmas radio seems inextricably bound up with messing around with "mikes." If you want to give your Christmas party a radio-twist you should certainly invite

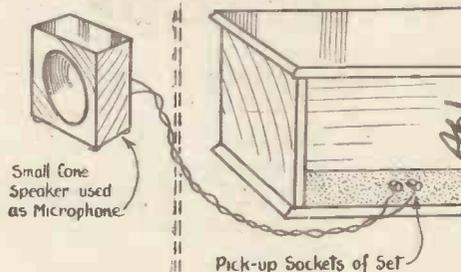


Fig. 1.—That old cone loud-speaker you thought was done with can be brought into service as quite a useful "mike"

"Mr. Mike" to join in the fun. My four diagrams may be of some help, then.

Let us start off with something quite simple. Using the old cone loud-speaker as a microphone, in fact. As you can see from Fig. 1, the idea is to connect this cone through a length of flexible wire to the gramophone pick-up terminals of the set.

Any old cone loud-speaker will do. So will any old set—although best results will be heard from a set with a good low-frequency amplifier.

Quality Will Be Throaty

Speak fairly close to the opening of the loud-speaker. About 6 in. away ought to do the trick. If you put your mouth too close the quality will be rather throaty—in fact, the rest of the party may not be able to recognise your voice.

Don't use a moving-coil type of loud-speaker unless you must—it is not so sensitive as a cone and may not give enough volume to satisfy the party with a small set.

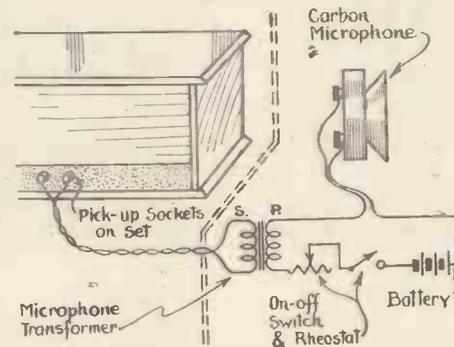


Fig. 2.—Of course, to do the thing properly a carbon-type microphone is wanted, wired up to the pick-up sockets

installed. The on-off switch is needed to cut the battery out of action when the "mike" is not wanted, while the rheostat is used to adjust the battery voltage for the best results during actual speech.

Easy Enough to Fit

Perhaps I have been assuming too much. Perhaps your set—battery or mains model—hasn't any pick-up terminals. Well, it is easy enough to fit them.

Fig. 3 shows how to do this with a typical

battery set. The grid lead has to be broken, for a start. Disconnect the grid terminal of the detector valve from the wire coming to it from the grid condenser.

Take the grid to one of the microphone leads, and the other microphone lead to the 1½ volts negative socket of the grid-bias battery. The

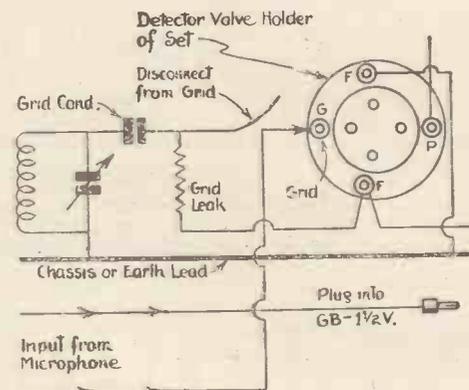


Fig. 3.—If the set hasn't any pick-up terminals the circuit must be modified by breaking the grid lead as shown here. The existing bias battery can be used

valve will then take up a negative bias and act as an efficient low-frequency amplifier for the microphone.

Radio or Mike

If the job is to be permanent a single-pole change-over switch must be introduced, so that the grid of the valve can be switched at will either to the condenser for radio or to the microphone for public-address work.

Fig. 4 shows you how the same idea can be applied to a mains set.

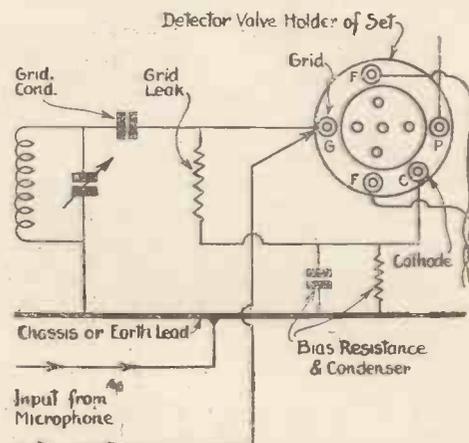


Fig. 4.—With a mains set the bias can be introduced for the microphone by the usual cathode resistance and bypass condenser. No need to break the grid circuit, though



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better
radio at
Christmas
use a

UNIVERSAL MODEL (Type B.P.U.)
Complete 65/-
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J. B. LINACORE



At Christmas, more than at any other time, your radio entertainment must be at its best. So use a J. B. Linacore tuner for your set—it gives a 3-valve set performance equal to a Superhet. There are three models.

Send 4d. in stamps for a copy of "VIVID RADIO"—a large broad sheet with three full-size blueprints to help you incorporate a Linacore tuner in your set.

Give Your Set a Tonic!



A poor DETECTOR VALVE is a Brake on the performance of your Set

The majority of broadcast receivers prior to 1933 used a Triode Detector. This valve may be said to be the 'key' stage in the set as upon its proper functioning depends the sensitivity, selectivity, quality of reproduction and general absence of background noise so essential to the correct working of a set.

QUALITY of REPRODUCTION and ABSENCE of BACKGROUND NOISE.

Absence of clarity in the reproduction or the presence of background noises can be removed by fitting a new Detector Valve. Long experience and attention to fine detail in the design of OSRAM Detector Valves has led to many improvements in mica bonding of the electrodes and special treatment to prevent parasitic noises.

Do not put up with inferior reception when your set can be so much improved by fitting a new OSRAM Detector Valve. There is a type for every class of broadcast receiver.

WRITE for the OSRAM VALVE GUIDE (1934 Edition). Sent post free.

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HL2/K or HL2.....5/6
For 2-volt Battery Sets.

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Treat your friends to a set of OSRAM VALVES this XMAS!

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On Your Wavelength!

By Thermion

The Wedding Broadcast

NO ceremony, I suppose, has ever received such a world-wide broadcast as the wedding of the Duke of Kent and Princess Marina. As soon as it was known that arrangements were being made, both for a running commentary on scenes outside the Abbey and for a relaying of the whole service from within the building, the B.B.C. was approached by the wireless authorities of countries here, there, and everywhere who wanted to "take" the broadcast.

Both of the big United States networks received it by means of the short-wave radio link and relayed it from all their stations. Canada had it, too, and it was picked up and relayed by many of the South American stations.

European countries were so keen on having the broadcast that many of them made special arrangements to receive it by land-line for re-diffusion, whilst others picked it up from Droitwich and passed it on to their stations. Austria sent a special commentator to give an account of the proceedings in German.

The whole thing was Blättnerphoned and sent out during the various Empire transmissions in the course of the following twenty-four hours. Thus there was probably no one possessing a wireless set who could not hear the proceedings, no matter in what part of the world he was living. A marvellous feat, when you come to think of it.

Television for the Next?

WHEN the next Royal wedding will be I don't know, but I'll be very much surprised if by the time that it comes along we aren't able to televise it and to see as well as hear in our own homes all that goes on. The present position of television is a very interesting one.

The high-definition system must be confined to the ultra-short waves, owing to the enormous band width required for the transmissions. Most of the technical difficulties have already been surmounted, and I have seen myself transmissions over ten miles which were very nearly as good as regards definition, clearness and freedom from flicker as the best of ciné films.

The main snag at the moment is that transmissions on wavelengths in the neighbourhood of 6 metres have a very limited range: you can, in fact, broadcast very little farther than you can see from the top of the aerial mast.

This means that to give the country a television service a network of low-powered ultra-short wave transmitters would be required, and this would, of course, cost a good deal of money. Still, television will come, and, personally, I don't think that it will be more than a year or two before it does.

Everyone is waiting impatiently for the report of the P.M.G.'s Committee.

Reception in the East

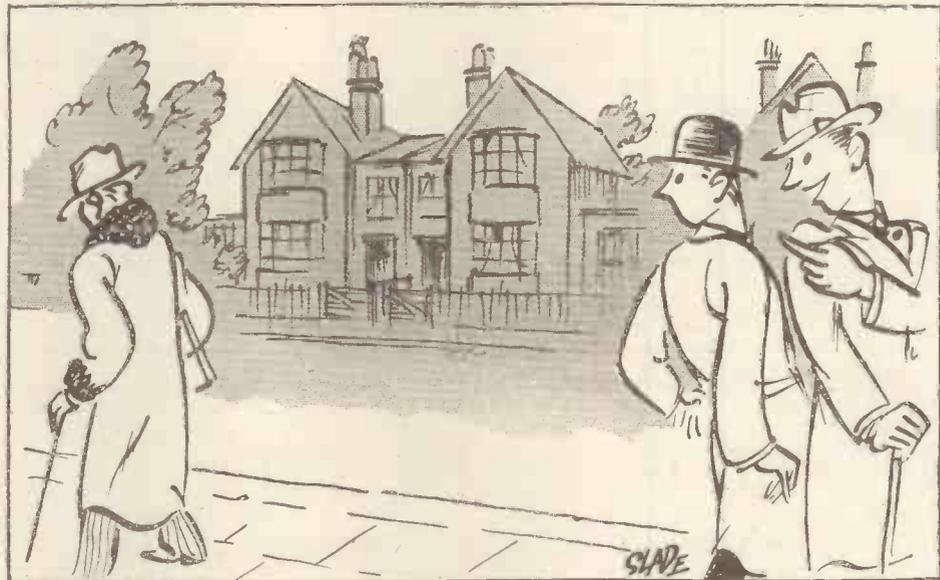
SOME time ago I mentioned that I had sent an all-wave receiving set to a young relative of mine who is stationed near the North-west Frontier of India. Recently I have had a long letter from him telling me of his results, and it contains one or two surprises.

Though he is always able to receive the Empire transmission on the short waves, he says that the best results, taking them all

the wireless licence. He then stated that he must examine the wireless set and, after looking it over, announced that he must take it away for further examination to make sure that it complied with the regulations. Quite a few receivers disappeared in this way.

'Ware "Second-hand" Sharks

ONE of the latest dodges is particularly neat, and it is almost a sure trap for the unwary. Here it is. A well-dressed affluent-



"He's one of those mystery singers at the B.B.C.—mystery why on earth they ever let him!"

round, come from the long- and medium-wave stations of Europe. Droitwich is frequently very good, and many of the more easterly European medium-wavers can be heard just now at fine strength.

India has a few medium-wave broadcasting stations of her own, but at present most of them operate at such small power that their range is very limited.

The Radio Trickster

THE number of wireless sets that are stolen each year is much larger than most people imagine, and those who do the stealing are extraordinarily clever in the tricks they invent for acquiring other people's property.

Some time ago their great dodge was the Post Office inspector's stunt. A fellow called at the house at a time when he knew that the husband would be out and, posing as a Post Office official, demanded to see the

looking chappie calls at your door and says that he hears that you want to dispose of your present set with a view to buying a new one. Even if you hadn't thought of doing so, it may cross your mind that there is something in the idea.

He inspects the set and offers a price much higher than the market value of the apparatus. He explains, though, that before he can come to a decision, he must try it in his own home to make sure that its beautiful tone is preserved in its new surroundings.

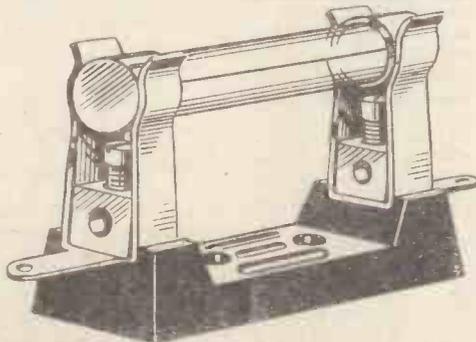
He gives you an address in a good locality and says that he will send his man round for it in the morning. If you part with that set to the aforesaid man you will probably never see it again.

Where Do Stolen Sets Go To?

YOU may wonder what happens to sets after they have been stolen by one of the many tricks that thieves practise. Obviously these gentry don't "want them for their own use"; one highly-skilled fellow cleaned up two hundred pounds' worth recently as the result of a single week's work in one town.

Actually they are sold at low prices to certain shops which offer them—again at attractive prices—as phenomenal secondhand bargains. Sometimes, if they are of recent date, they are even re-polished and offered as brand-new sets.

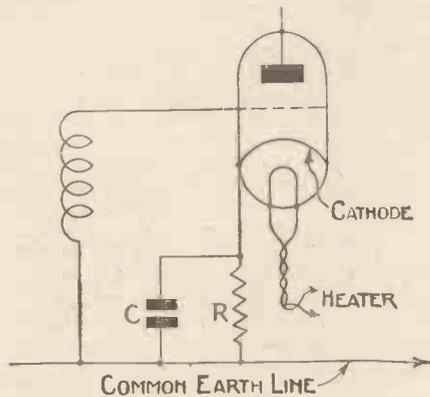
Beware of any set offered to you with the



A fuse in time may save nine valves—if your set has nine valves, of course! Seriously, though, every set ought to include a fuse in the high-tension circuit

"A.W." Reference Sheet—No. 10

Automatic Mains Grid Bias



Circuit for mains automatic grid bias

AUTOMATIC grid bias can be obtained, when indirectly heated valves are being used, by the simple process of connecting a resistance in the cathode lead. This has the effect of causing a voltage drop in a similar manner to the resistance inserted between the negative high- and low-tension points in a battery receiver.

There is one difference which is very important, and that is the bias obtained depends upon the current flowing in the anode circuit of the associated valve, and

not, as in the previous case, the total current of the whole circuit.

This enables the bias to be controlled to a very accurate degree, while valve changing does not involve any considerable amount of calculation or alteration to the circuit. The cathode is normally at earth potential and completes the anode current circuit.

It will be appreciated, therefore, that any current flowing along this path will cause a certain voltage drop if resistance is inserted. (Ohm's Law, Sheet No. 8.) The value of this voltage will depend on the current flowing, which in this method will be the current taken by the valve, and the amount of resistance.

It is necessary to connect a condenser across the resistance to provide a by-pass for any high- or low-frequency currents, thus preventing their return to the grid of the valve and the possibility of instability through feed-back.

The method of calculating the value of the resistance is

$$R = \frac{\text{Grid bias required} \times 1,000}{\text{Current taken by valve.}}$$

The by-pass condenser should have a value of, say, .1 microfarad for high-frequency circuits, and a minimum capacity of 2 microfarads where low-frequency circuits are concerned.

makers' number on the chassis erased. If it hasn't been stolen, the odds are that there's something pretty queer about it. Remember, too, that these "second-hand" bargains carry no service guarantee and many of them are pretty cleverly faked up.

The Vistogram

AN important manufacturing company is, I hear, shortly to place on the market a remarkable home-entertainment device. In a word, it consists of a combined wireless and television receiver which also handles film records containing both sound and vision tracks. The vistogram is the rather neat name chosen for it.

It is stated that the complete apparatus will not cost more than £20 and the talkie film records, running for a full twenty minutes, will be sold at only two shillings apiece.

If this is so, they cannot be of ordinary ciné film, even of the miniature type, for the cost of these would work out to several pounds for a twenty minutes' run.

No further details are available, but I expect that there is something pretty good in the invention, since it has the name Edison Bell behind it. Anyhow, I'll await further particulars with interest.

Servicing Ramps

LATELY I have come across several cases of what I consider ramps in the matter of servicing wireless sets. Let me hasten to say that one or two big concerns, such as Philco, Ekco, and Aerodyne, have water-tight service guarantees which let you know exactly where you are should one of their sets go wrong.

A good many other guarantees, however, are much less satisfactory. They undertake to make free replacement of defective parts within the guarantee period, but tucked away in them is a stipulation that a charge will be made for the labour involved.

I have seen labour charges of fifteen shillings

or more made for replacing defective parts that were not themselves worth half as much. This is utterly unsatisfactory, for the customer who finds that "free servicing" means in reality a pretty big bill, naturally feels that he has been "had."

France's Radio Chaos

ALL is far from being well with broadcasting in France, as those who do much listening to foreign stations must have noticed for themselves.

The main cause of the trouble is that no French Government in recent years seems to have lasted more than a month or two. The broadcasting is under the control of the Minister of Posts, Telegraphs and Telephones (PTT), but no sooner has a new Minister settled down to tackle the problems with which French broadcasting bristles than his Government is defeated, and his successor replaces him at his desk.

Minister after Minister has "closed" down the Eiffel Tower. Placing a metaphorical thumb to its metaphorical nose, the Eiffel Tower still carries on.

Radio Vitus and Radio LL wander as they like over the medium waveband, heterodyning all and sundry. The common-wave stations occupy any wavelengths but their own. And so it goes on.

Meantime several of the French high-powered stations under the Ferrié scheme are nearing completion, and just how they are going to be fitted in to the broadcast band no man knoweth.

Fifty Fifty

THE I.E.E. Committee says that artificial static is developing into a widespread and serious source of annoyance to the broadcast public, and agrees that prompt and effective steps are necessary to relieve the situation. And so, I may add, say all of us.

But it goes on to suggest that listeners do

not make sufficient use of the various devices that are now available for getting rid of such interference.

To a certain extent I agree, but, on the other hand, this kind of argument can easily be stretched too far. There are so many cases in which listeners have tried their best in vain, that it is time some steps were taken to compel those who actually cause the trouble to "desist."

I don't say we want things all our own way, but if the real offenders won't fall into line voluntarily then they should be legally "warned off" the ether.

Supersonic Sounds

MOST of us have suffered from time to time from the effects of the other fellow's too-loud speaker. If he is overdriving the set there is nearly always pretty fierce distortion, and then it is hard to say which hurts the most—the high notes or the low.

However, according to recent experiments, it seems that the higher the note the more deadly it can be. For instance, supersonic sounds can be produced by means of piezoelectric crystals, which are so high-pitched that they will instantly kill certain kinds of insects and larvae, whilst other forms of life—including bacteria—give up the ghost after a very short struggle.

Strange to say, some kinds of plants—in the seedling stage—appear to flourish under this form of high-frequency treatment, though others do not, on the principle, apparently, that one man's meat is another man's poison.

Mobile Sets

MANY of the problems peculiar to fitting a motor-car for radio reception on the road apply equally to aircraft wireless installations. The difficulty, for instance, of cutting-out ignition noise at close quarters exists in both cases, as well as that of providing an effective form of aerial.

Of course, on an aeroplane it is necessary to be able to transmit signals as well as to receive them, and here the long trailing wire gives the best results—in spite of certain obvious disadvantages.

One cannot very well use a trailing wire on a motor-car—nor is it necessary, because the modern receiving set will do wonders on the pick-up from a few feet of wire in the roof, or from a strip of metal laid underneath the running board. When one wants to transmit from a motor-car, as is sometimes necessary in mobile police work, a telescopic rod can be used for the aerial.

The Three-Valve Set

ONE is always reading nowadays about the "world's finest three-valver," the "finest three-valve set ever made" and so on and so on. Is one three-valve set really vastly better than another?

A badly designed three-valver—I am talking of the high-frequency detector and low-frequency set—is a pretty poor performer as a rule. Its selectivity is hopeless, and its sensitiveness ditto, mainly because the reaction control is fierce and floppy.

When we come to the well-designed three-valve set, matters are rather different. Here you can obtain the greatest attainable magnification by the use of three pentodes, and if you have perfectly smooth reaction you can afford to use highly selective tuning coils.

In three-valve sets there are limits beyond which you cannot go and myself I think that the three-valve sets designed by the "A.W." and W.M. Staff have all the sensitiveness and the selectivity that it is possible to obtain. In a word, you won't get better results whatever kind of three-valver you build or buy.

They'll Spend Xmas at Sea!

BUT WILL 'PHONE HOME FROM THE LINER

ON Christmas Day ships at sea will be in almost constant communication with the receiving stations at Baldock, England, and Rocky Point, New Jersey.

This year, more than ever before, ship-to-shore telephony will enable passengers to keep in touch by sending messages to friends and relatives in all parts of the world. Such vessels as the *Empress of Britain*, *Duchess of*

"Duchess of York"
—just one of the liners that will keep in radio touch with land over Christmas



From her state cabin she can send telephone messages via radio up to 5,000 miles—a scene on the "*Empress of Britain*" during a recent voyage

station at Rugby and picked up by the vessel wherever she may be, up to about 5,000 miles.

During a world trip last year the *Empress of Britain* kept in constant touch with Rugby, even when as far off as Australia and New Zealand.

You can get no end of fun listening on the 65/75-metre band for these ships and hearing the official messages giving speeds, and location, etc.

Christmas Day this year will be even busier than usual. There will be more than a dozen large liners somewhere between Ireland and New York, all of which can be picked up on a fairly efficient receiver.

P. & O. boats between Australia and Colombo will also be calling Rugby, while several vessels will be cruising off the coasts of Portugal and Spain and in the Mediterranean. Remember that all of these ships will be using a wavelength between 65 and 75 metres or between 20 and 23 metres, according to locality and time of day.

Rugby is now the central clearing station of the world for ship-to-shore telephony, while to a lesser degree the high-power station of Rocky Point, New Jersey, handles traffic for Bermuda, South America, and some of the Atlantic liners.

The Rocky Point transmitter will be calling the *Empress of Britain* on Christmas Day and onwards until it reaches the West Indies, and these messages can be picked up and will be of considerable interest to short-wave listeners. Passengers on boats will be able to exchange greetings with passengers on other vessels in any other part of the world, and you can be sure that on Christmas Day all liners will be working their radio telephones to full capacity.

Listen to the "Homeric"

Another vessel which can be picked up quite easily is the *Homeric*, and its call sign of GDLJ is well known. Tune in to 67.72 metres or 22.52 metres and see what you can hear. This vessel is equipped with a very efficient Marconi ship-to-shore gear, and although its working range is restricted to about 5,000 miles it has from time to time been heard in almost every part of the world.

By means of the Baldock receiving station and the Rugby transmitter, telephone subscribers in all parts of the world will be put in touch with radio-equipped liners almost as simply as they would make a local telephone call.

The P. and O. liners *Rawa-Pindi*, bound for China, and the *Comarin*, will be between Marseilles and Port Said, the *Strathair* between Bombay and Aden, and the *Cathay* at Colombo. Messages will be exchanged between these vessels and Europe during the whole of the Christmas period. Confirmation of reception cannot always be obtained from these liners, but generally the engineer will send a card.

Last year many readers were able to follow these vessels on their way to Australia for days at a time. The power used is very high, somewhere in the order of 20 to 30 kilowatts, and the wavelengths are carefully picked.

Why Rugby has been called the world's telephone exchange will readily be understood after you have spent an hour or so listening to the messages handled. Telephone subscribers from Asia, Africa, Australasia and so on will all be calling up friends on Christmas morning. K. J.

York, *Homeric*, and *Monrose*, will all be somewhere in mid-Atlantic on Christmas Day.

The *Empress of Britain* leaves before Christmas with a full complement of passengers on a trip to the West Indies, via New York.

Passengers on board will make full use of the radio telephone to speak to friends on both sides of the Atlantic, while official messages are sent out at regular intervals.

Short Waves

Christmas is becoming a time for the short-wave enthusiast to log and, in fact, follow these boats on their voyages across the world. Tune your short-waver to 67.99 metres and listen for the call sign GMBJ, the *Empress of Britain*.

These messages are picked up at the receiving station at Baldock, and then transferred to the normal telephone lines.

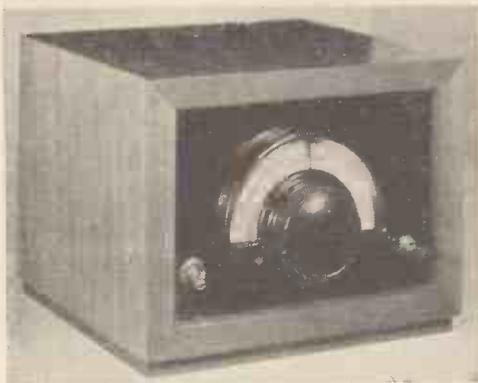
The replies are transmitted back through the high-power



This is the business part of the radio link maintained with shore stations by the "*Empress of Britain*." Marconi short-wave equipment is used for the radio-telephone contacts

Radio Gifts Will

Some Useful Pointers by THERMION



"I cannot imagine a present more welcome . . . than a nursery crystal set." The 150-mile set made by National Radio Service

ONE of the happiest households I know has found a delightfully simple way of solving the Christmas-present trouble. When He and She were newly-weds there used to be awful trouble.

You see, She would give Him a box of cigars or half a dozen neckties; and you can take it from me, dear reader, if you don't know by personal experience, that the kind of cigars or ties that lovely woman chooses for mere man are usually pretty fearsome things.

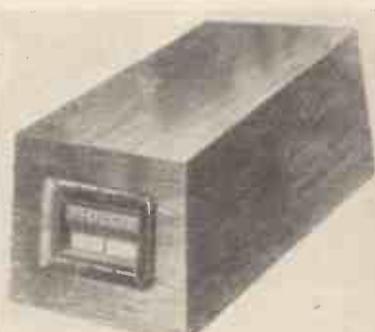
Then He felt impelled to present Her with a fur or umpteen pairs of silk stockings. Believe me or believe me not, mere man's taste in furs and stockings is even worse than lovely woman's taste in cigars and neckties. Furs always have heads where they should have tails, and stockings are beige when they should be sun-tan or vice versa.

Inspiration

For some years these two grinned and bore each other's Christmas presents. Then one or other of them had an inspiration, and now all is well. He gives Her cigars or neckties and She gives Him silk stockings or furs.

You see the idea?

Now, that strikes me as being an excellent



"You can now buy excellent tuning indicators of the shadow type." Here is the Philco unit

way of settling the wireless Christmas-present problem within the family. Wifey will be delighted to find beside her plate on Christmas morning a microammeter or a couple of double-diode-triodes, for does she not observe by hubby's plate a new blouse of the right colour and from the right shop, or the latest thing in saucy berets



"Better still is the multi-range test instrument. . . ." The well-known Avominor

equally well chosen!

Perhaps the best of all ideas is to make the present a combined one. The lady presents her lord with half a wireless set and he gives her the other half. The result is eminently satisfactory both to them and to the rest of the family.

This is the year, if ever there was one, for a combined present of that sort, for never has it been possible to obtain so much for one's money in the way of a wireless set as it now is.

From 10 to 15 guineas will purchase the very finest of A.C., D.C., or A.G./D.C. super-hets. And it is well worth while to have a new set, for this year's models leave most of last season's a long way behind as regards both efficiency and the quality of their reproduction.

Should you not want anything so ambitious as the super-het, there is always the straight, whose price will range from rather over 7 to rather under 10 guineas.

Supposing that you haven't mains of any kind, it must, of course, be a battery set; and

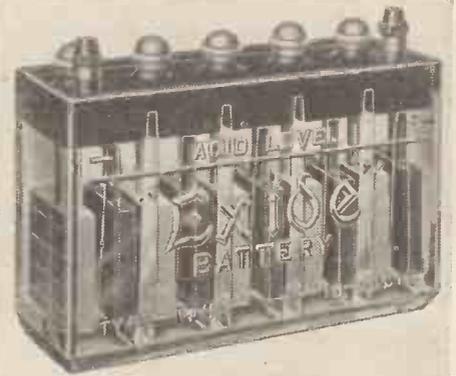


here again those of the 1934-35 vintage represent a pretty big step forward over the products of yesteryear.

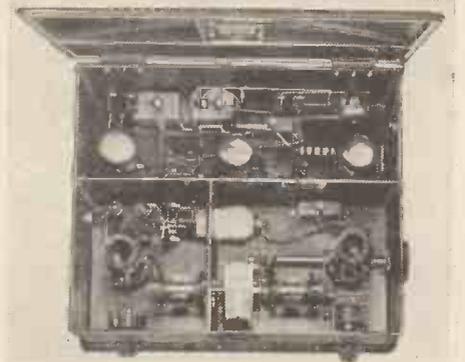
A first-class battery super-het with class-B or pentode output will cost from 10 to 14 guineas, whilst a battery straight—far more selective than the old set and capable of a really fat output—will cost no more than from 4 to 8 guineas complete.

The Jolliest Presents

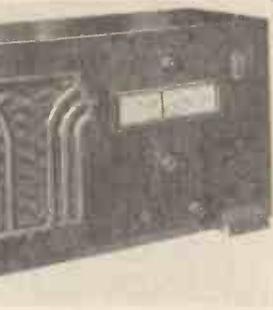
There are lots of other opportunities for giving the jolliest of wireless presents within the family. Should you live reasonably near a broadcasting station, I cannot imagine a present more welcome to the kiddies than a nursery crystal set of their very own. The



"Accumulator high-tension units for battery users." An Exide unit of sound design



"There is no more delightful present than an all-wave set." The Eddystone All-world Four is one of the best all-wavers



"From 10 to 15 guineas will purchase the very finest . . . D.C. super-het." The G.E.C. type D.C.5 Super-het.



What could be better than to wake up on Christmas morning and find an H.M.V. Super-het Portable Six by the bedside?

crystal set is absolutely safe and you can let them mess about with it to their heart's content, without any fear of possible untoward consequences.

For older children there is no present quite so good as a kit of parts for one of the up-to-date "A.W." set designs. Schoolboys, and schoolgirls, too, love building things; and no set ever gives quite so much pleasure as the one which you make for yourself.

Some of the young hopefuls may be grown up or nearly so. If they are real wireless enthusiasts, there is nothing they'll appreciate better than first-class measuring instruments. Everyone who does a little wireless experimenting needs a milliammeter.

It needn't be expensive, though it should certainly be of the moving-coil

Be the Fashion!

type. Probably one that reads from 0 to 25 milliampers is the best all-round instrument. Then there is the high-resistance voltmeter, also of moving-coil pattern. Here I would recommend a range of 0 to 200 volts.

Better still is the multi-range testing instrument of which many types are available at most reasonable prices. One kind consists of a basic instrument for which a large variety of shunts and resistances can be purchased,

Here's another idea. Some member of your family or some friend is not going in for a new set, since the old one works quite well. But the old set has one rather big drawback: it is a super-het without a visual tuning indicator. You can now buy excellent tuning indicators of the shadow or neon-tube type made up in neat little units which



"Another kind of multi-range measuring instrument is self-contained. Here is the Pifco Rotameter"



"Devices which enable the wireless set to be turned into a gramophone." Try the Rottermel piezo-electric pick-up



"Mains units for those with battery sets plus electric light." Extraordinary well designed is this Atlas model

enabling it to be used for reading anything from a few microamperes to tens of amperes or from millivolts to hundreds of volts.

If the Christmas present takes the form of the instrument with just two or three shunts and resistances, the recipient of the gift can add others from time to time.

Self-contained Testers

Another kind of multi-range measuring instrument is self-contained, there being no external shunts or resistances. Either there is a switch, by means of which changes from one range to another are made, or there are different sets of terminals for the connections. In whichever way they are arranged, these "multi-rangers" instruments make inexpensive gifts.



"There is no present quite so good as a kit of parts." Unpacking a Pilot Kit for "A.W.'s" All-Britain Three

are easily connected to the "works" of the set.

Then there are the devices which enable the wireless set to be turned into a gramophone at will. The simplest of all methods is to fit a pick-up to an existing mechanical gramophone, connecting the pick-up



Elsie and Doris Waters know a good set when they hear one; here they are with their Ekco RG84 radio gramophone



(Left) "What about disturbance suppressors?" This T.C.C. unit would be appreciated by many mains users

Additional loud-speakers for use in other rooms; remote controls, either for cutting in or out an extra loud-speaker or for actually tuning the receiving set; car radio sets; accumulator high-tension units for battery users—those of the type which can be charged from a 4- or 6-volt filament battery are particularly acceptable; mains units for those with battery sets plus electric light in their homes.

Mains Noises

And what about disturbance suppressors? Many of your friends who run all-mains sets must be plagued out of their lives by a variety of noises caused by electrical machinery and so on. Investigations have shown that an enormous proportion of this kind of interference is brought in by the mains themselves, and that it can be eliminated by means of suitable, but quite inexpensive, suppressing devices. Can you think of a more welcome present?

And now I want to mention the case of the relative or friend who is living in some out-of-the-way corner either in a country of the British Empire or in some foreign land. Here there is no more delightful present than an all-wave set. As a rule, it must be battery-



This Exide cell shows you when it wants recharging



A fine A.C./D.C. set made by Ferranti's; it is the Universal model

leads to the terminals provided for them. A large variety of good pick-ups is now available.

There is also the self-contained unit with motor, turntable, and pick-up housed in a flat cabinet which makes a stand for the receiving set.

Nearly all the presents I have mentioned are just as good for giving to friends as for members of the family. Here are a few other ideas.

Continued on page 613



Some Seasonable Technical Stunts Disclosed by PERCY W. HARRIS

THERE is no reason whatever why radio should not be drawn into the Christmas festivities. On the contrary, properly handled, it can provide excellent fun. But only, mark you, by the aid of good wholesome old-fashioned deception, properly pre-arranged and carried off with a well-assumed innocence.

Take that new set of yours. You are very proud of it, and it gives excellent quality. If it is a well-known design, so much the better. The more the advertisements boost it, the more fun it can provide, always assuming that the

speaker terminals beforehand, so as to remove every trace of top should not worry you. That is your guests' worry.

They will look slightly puzzled at first, and then come to the conclusion that you must be right and that it must be the sherry. In a few minutes they will be reasonably well persuaded that it is not the set, but they, who are wrong, or else it is the room, or something.

If someone suggests that the set does not sound any too good, you will find plenty of others to say it does, just to be polite. You have no idea what people will put up with after a few minutes' listening.

And then there is your new crystal set with the enormous range.

This wants a little preparation, but is worth it, for it will deceive even the wireless enthusiasts if properly "worked."

First of all you want some kind of a case or cabinet as a stand for your wonderful set, made as shown by Fig. 1. It should be open at the

some beading or in some way so as to conceal them and then thread them under the carpet to the set output. The set must be concealed somewhere and tuned to some well-known and easily recognisable Continental station.

Screw a false top on the underside of the transformer and bring the backpiece down so that people cannot notice the thickness of the top which conceals the transformer. This is made quite clear in the drawing.

Fit a shelf half way down as a "blind." Now make a wooden box big enough to take a second and similar transformer—an ordinary low-frequency transformer will do if the primary winding inductance is not too high.

Fit a tuning dial to the front, fixing it so that it cannot turn, and equip the top of the box with the conventional crystal holder and catswhisker. 'Phones should be connected to the primary winding and you can fit another knob or two if you so desire. (Fig. 2.)

No Direct Pick-up

Now, owing to magnetic leakage the upper transformer will pick up a good loud signal from the lower, without any direct connection at all. After the necessary preliminary boasting, together with circumstantial stories of what you have been offered for the invention, you

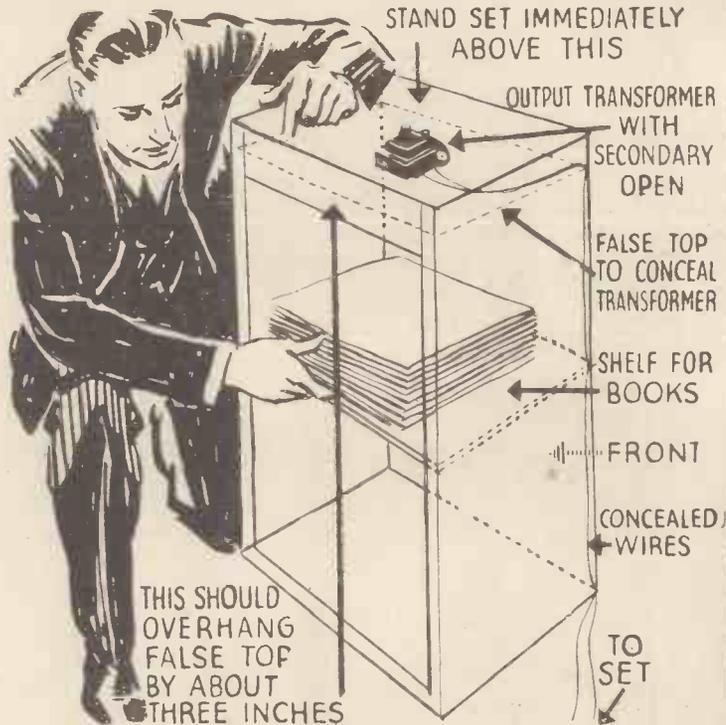


Fig. 1.—This is the arrangement of the cabinet for the stunt crystal set, showing how the output transformer is mounted just below the set platform

victims of the trick are unaware of the true facts.

The idea is to talk about the set a great deal before you show it. Praise it extravagantly, dilating upon its admirable tone qualities and all the other advantages which have been thought up by the exercise of your own vivid imagination before the affair begins.

Don't go off at half cock. Make a real job of it.

And then turn it on, assuming immediately that vacant and semi-seraphic smile which means that you, and you alone, are the possessor of a set that is really "the goods."

The fact that you have placed about a .25-microfarad fixed condenser across the loud-

back and so arranged that it is awkward to go behind it to look at what is inside. This is intentional, because to look inside it is just what all the smart boys will want to do.

On the underside of the top screw an output transformer and connect a pair of leads to the primary side, leaving the secondary side open. Take the leads down behind

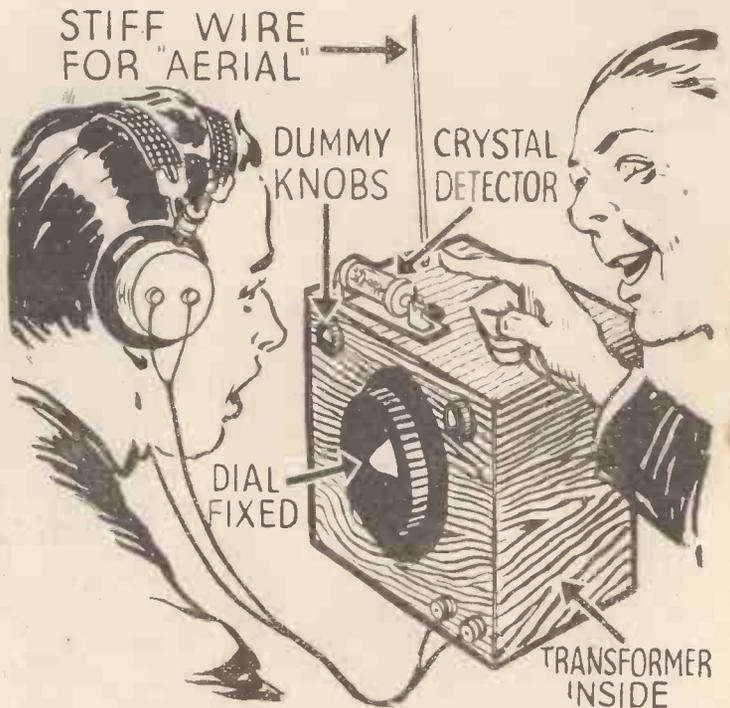


Fig. 2.—How the crystal set is faked to appear as though it is just an ordinary affair, with dummy control knobs on the outside—and a low-frequency transformer inside.

CHRISTMAS PARTY



ARRIS, M. Inst. Rad. E.

Spend about five minutes adjusting the set (or pretending to) and then proudly hand over the 'phones to some one else with the announcement that "That is Radio-Paris," or Rome, as the case may be.

Ordinary non-technical friends and relatives will say "Good Gracious!" and so forth, but the technical fellows will smile in a superior fashion and start looking for the wires.

There Is No Deception!

Taking care that nobody is wearing the 'phones you lift the box clear, showing that not only are there no leads, but there is not even an aerial and earth, except six inches of stiff wire which should stand up prominently from the box and be marked "Aerial."

This puzzles them for a minute or two, and then some particularly offensive and superior person says with studied politeness "Would you mind showing us the inside of that case on which the set is standing?"

You immediately look uncomfortable and try to make excuses. This increases their superiority a thousandfold. Keep up the excuses a little longer and then give way.

The cabinet is turned round, showing a shelf full of old copies of AMATEUR WIRELESS and Wireless Magazine, and, if you like, on the bottom shelf, a certain piece of crockery from another part of the house. Hence, of course, your embarrassment.

At this time of the year it is often suggested that a microphone should be connected to the pick-up terminals and used to "fake" announcements.

That Announcing Accent

It is not difficult to arrange technically, but the trouble is that few people have voices even remotely resembling the standardised voices of the B.B.C. announcers, and those that have, are usually so superior that they will not play games of this sort. And nowadays everybody is so accustomed to the official announcements that they are not readily deceived.

If you want to use a microphone, place the set in some dark corner near the mistletoe, so that a sepulchral voice can say "Now then, you go!" at the appropriate moment. It's rather a dirty trick, but excusable at Christmas.

Like this article.

Using a Microphone

For the Christmas party a microphone of some kind is almost invaluable in providing what are generally known among the Bright Young People as fun and games. Perhaps it is not realised that most sets are already provided with what amounts to microphone terminals—the pick-up connections. These enable the microphone to be connected to the grid input circuit of the detector, which acts as a low-frequency amplifier as with a pick-up. As a rule a two-valve amplifier gives best results.

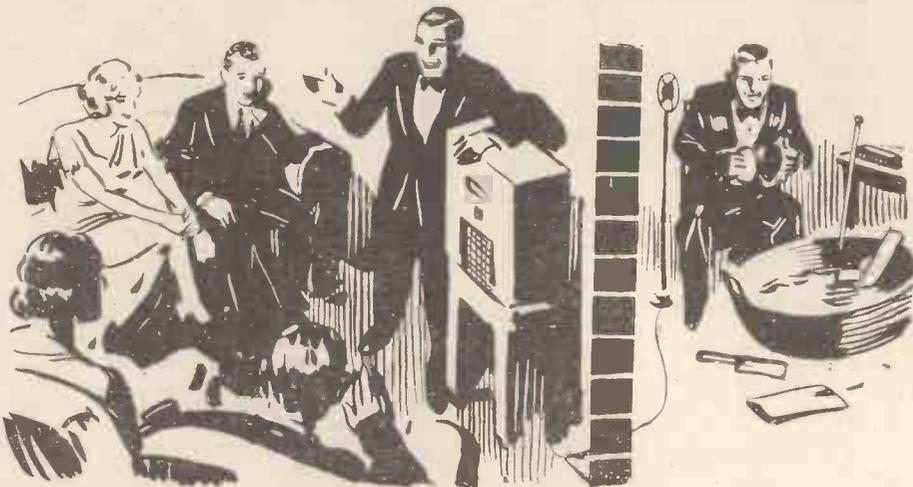
Try These Radio Tricks on Your Friends



For this trick you need a metal pail, a high-tension battery concealed from sight, two lengthy wires—and a penny. Connect one of the leads to high-tension positive. Place the pail on the lead's bare end. Fill the pail with water. Connect the other lead to high-tension negative. Then ask the victim to grip this lead and pick the penny from the bottom of the pail. The resulting electric shock, although quite harmless, will make the fellow jump!



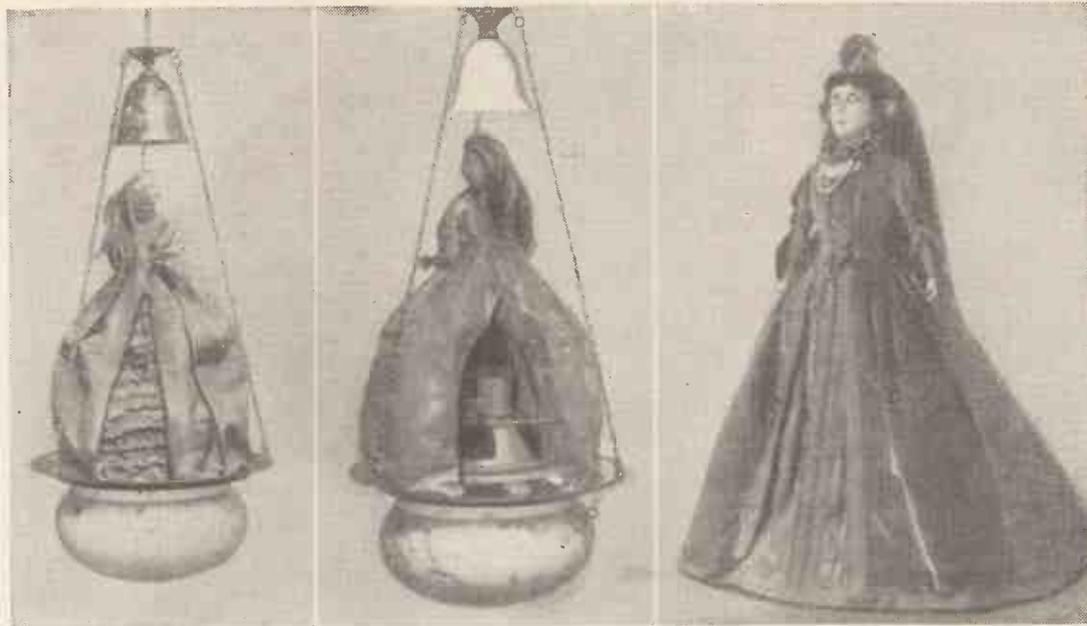
By connecting the loud-speaker to the grid terminals of the set and taking leads from the loud-speaker terminals to 'phones in another room you can easily "thought read"—the set's loud-speaker acting as quite an efficient microphone



With a carbon-type microphone endless fun can be arranged with the wireless set. Here is just one game—asking the company to guess the sounds made in the next room by the "effects" man, whose mike is connected to the pick-up terminals of the set

Hang the Loud-speaker!

Artistic Disguises
for your Reproducer



WITH the loud-speaker becoming more and more stereotyped, it is refreshing to come across the designs shown by these photographs.

They are the work of A. Ford-Lloyd, of 3, Severus Road, Clapham, S.W. 11.

As can be seen, the idea is to hang the loud-speaker in a pendant, a figure hiding the "works." The doll model is movable, and can be made, of course, to represent any well known celebrity.

As our ingenious correspondent point out, the bottom globe could be illuminated and if desired used for advertising purposes.

In the actual models illustrated on the left a standard moving-coil type of loud-speaker chassis has been cleverly hidden, and the sound is thrown in a downward direction.

Christmas Programmes for 1934

A Review by WHITAKER-WILSON

HENRY HALL seems to be working hard throughout the holiday season, judging by what he has told me. In addition to his normal transmissions, he is organising a special feature consisting of reminiscences of pantomime, in which he hopes to bring some of the stars of the various London pantomimes to the microphone. He wants them to work their hits into his dance-band programmes. This may prove to be worth hearing.

I gathered that on December 22 there will be a great Guest Night, in which some London stage stars will take part. Henry always asks the right people, you notice.

Merry Noise for Children

On Christmas Eve, the Dance Orchestra will make a merry noise for the children and will play tunes for their games as well as for them to dance. Comedy numbers will be a strong point in this programme. Henry himself has two jolly children and can be trusted to know what to give the youngsters at this season.

On Christmas Day, from 7.30 to 9.30 p.m., there is to be a Christmas Party, in which the band will do various stunts, I hear. The late period from 9.40 onwards will be given over to ordinary dance music. Henry is expected to have a caviare sandwich and a bottle of something or other on the banks of the Thames, as his transmissions are now coming from the wharf studio.

At 5.15 on Boxing Day, Henry will be at it again giving the kiddies another programme. He will also be heard on New Year's Eve. In addition to this, there will be dance music from the Mayfair Hotel on the 21st and the Hungaria Restaurant on Christmas Eve.

Looking a little more on the serious side, I think you should not miss the carol service from King's College, Cambridge, in the afternoon of Christmas Eve. Most collegiate

chapels can produce fairly good carols, and, of course, all cathedrals; but you cannot hear finer carolling than that provided by King's Choir. They are soaked in tradition up there and really know how to render carols. In the evening there will be another carol service from St. Mary's, Whitechapel.

You can hardly expect the same singing standard from an East End church, but they know what they are about at St. Mary's. Their carols will probably be more popular than traditional. Thus both broadcasts will be valuable.

The Christmas morning service comes from another chapel where they know how to sing—St. George's, Windsor. There will be an address by the Dean of Windsor, Dr. Baillie.

On December 30, there will be a special service from Canterbury Cathedral with an address by the Archbishop. Also a New Year's Eve broadcast, probably from Winchester Cathedral. When I inquired about it, arrangements had not quite been completed.

The Children's Hour seems not to have been forgotten over Christmas. Mabel Constanduros and Michael Hogan will be on the air on December 24, giving the children full knowledge of how the notorious Buggins Family spend their Christmas.

On Christmas Day, "Mac" takes over the hour, and there will also be a surprise item. On Boxing Day there will be a pantomime concerning one Aladdin, who will be expected to use a neon lamp. That comes from the Midlands. On the 27th a production called *Silver Candlesticks* will be given.

Christmas all round the Empire will be celebrated on Christmas Day. It is to be called *Empire Exchange*.

It will begin with the Bells of Bethlehem and the Bells of the British Commonwealth. These will precede Big Ben at two o'clock. After that British citizens all over the world will tell you how they spend Christmas. An Indian Army officer, tucked away somewhere in the Khyber Pass; a Canadian lumberjack; a native chief in South Africa, and a life-saver from a beach in New South Wales.

I suppose somebody will be pitched into the water and he will rescue him (or, more dramatically) her, propose to her, marry her, and that will be that.

His Majesty the King

And then the voice of His Majesty the King at the end, speaking from his study at Sandringham.

The Outside Broadcast engineers have taken elaborate pains to be sure that the royal voice will be efficiently flashed to every corner of the Empire.

Between Sandringham House private exchange and King's Lynn exchange there will be no less than four distinct telephone lines. The best of these will be selected when the relay is about to begin—for a great deal depends on the initial clarity of the lines.

The Christmas Party looks as though it might be good. I was told the Mellhuish Brothers have written a burlesque for it. They never let us down. Also there will be a broadcast of a stage arrangement of *Oliver Twist*.

Altogether the B.B.C. is evidently out to entertain us. Let us hear them and not grumble. The whole scheme only absorbs 1/4d. of our licence money.



For the Constructor Crusader

Screen-grid . . . Detector Ideas

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

A SHORT while ago I suggested casually in one of the articles on neutralising that it might be preferable in certain circumstances to use a triode valve for the high-frequency amplification and to employ a screen-grid valve as the detector. I have been asked to give some further particulars as to the best use of the screen-grid valve in this connection.

More Expensive

The screen-grid valve is, of course, more expensive than the triode and therefore it must give better results to justify itself. Given proper conditions it will do this as I shall show. Most readers will have a spare screen-grid valve around and they will be able to try for themselves the various circuits shown.

The first advantage of the screen-grid valve is in the matter of amplification. The detector stage of a set not only rectifies the high-frequency currents, extracting the low-frequency modulations from the carrier, but it also amplifies the low-frequency voltages so obtained. If we can increase this amplification we obtain a more sensitive detector.

Average Gain

The average grid detector gives a gain of about fifteen times. Thus, if we supply a signal of 1 volt high-frequency modulated to a depth of 30 per cent., the effective low-frequency input to the valve will be .3 volt. The low-frequency output in the anode will be fifteen times as great, i.e., 4.5 volts.

This sounds quite good, but one must remember that a carrier voltage of 1 volt is quite

a strong signal and that the average distant station gives a voltage at the detector of nearer .05 or .1 volt. Such a voltage would not be sufficient to load up an output valve even of the high-sensitivity pentode type.

A screen-grid valve, on the other hand, can do much better than this. It is possible to obtain a gain of about 100 on weak signals even with a battery valve, which would result in quite a strong signal being applied to the output valve even with a weak input of the order of .1 volt. With a mains valve an even higher gain can be obtained.

How are we to obtain this high gain? Owing to the high internal resistance of the screen-grid valve it is practically essential to use a resistance-coupled circuit with an anode resistance of the order of $\frac{1}{4}$ megohm or even more.

Screen Voltage

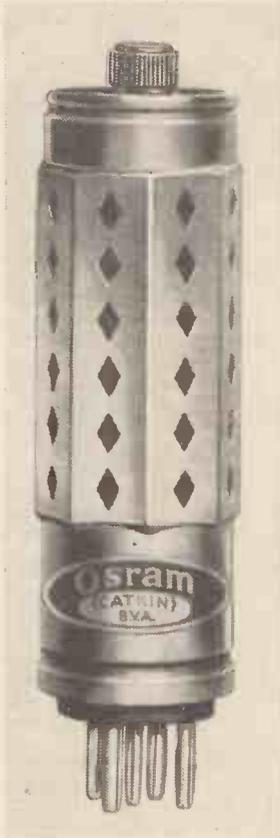
Under such conditions the effective voltage on the anode depends on the current being taken and this in turn depends on the screen voltage. For best operation the screen voltage is rather critical so that it is easy to obtain a quite incorrect set of conditions giving very disappointing results if the valve is used in the usual manner.

Fortunately, it is possible to overcome the difficulty by using a floating or trailing screen as shown in Fig. 1. The screen voltage is taken from the full high-tension tap through a high resistance but no resistance is connected from the screen to cathode as is usually done. Hence the voltage on the screen depends on the screen current and the circuit will adjust itself automatically to the correct conditions.

Correct Conditions Maintained

Suppose that the anode voltage (and current) is too low due to the anode resistance not being exactly right. The screen current will tend to increase (because the total current to anode and screen is always practically constant), but this will immediately cause an increase in the voltage drop on the screen resistance so that the screen voltage will fall and the correct conditions will be maintained.

The importance of this action is shown by Fig. 2, where we see the



Osram metallised screen-grid MS4B and VMS4

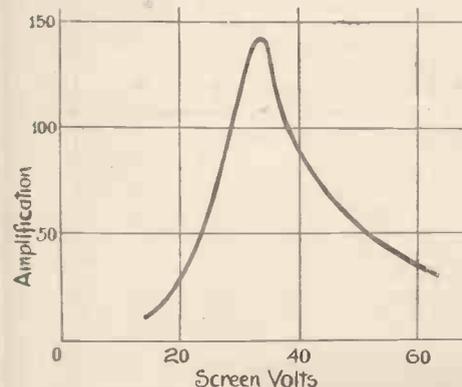


Fig. 2.—Amplification plotted against screen-grid volts

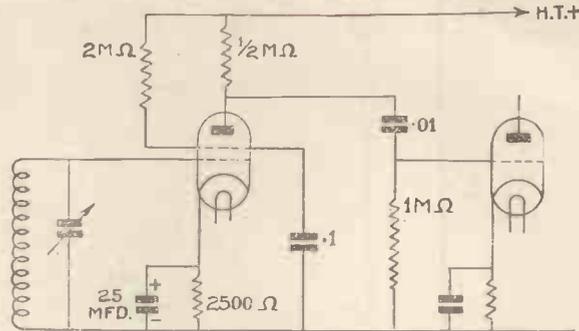


Fig. 3.—Typical mains circuit with self-bias arrangement

amplification plotted against screen volts. With a particular screen voltage (usually about 30 the curve shows a very sharp peak indicating that unless the voltage is just right the amplification will only be a fraction of what it should be. On the other hand, if a trailing screen resistance of suitable value is used this effect is not present at all.

Self-controlling Detector

Another useful feature of the screen-grid detector is that the amplification depends to some extent on the strength of the signal. With a weak signal the maximum gain is obtained, while as the input increases the amplification falls off. This is a most useful property because it gives us a self-controlling detector and, indeed, it is possible to arrange

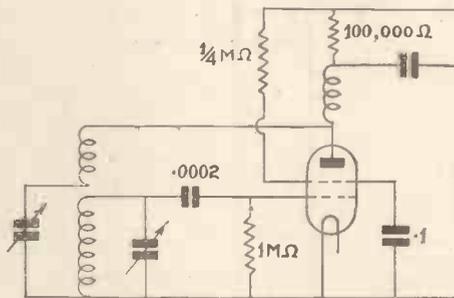


Fig. 4.—This form of circuit is very pleasing to operate—a screen-grid detector with reaction

the circuit so that a variation of several hundred to one on the input produces very little difference in the output. This can be seen from Fig. 6.

I have made attempts to use this as a form of automatic volume control but it is unfortunately insufficient and overloading takes place on really strong signals. However, if one is prepared to cut down the strength on local stations, or, better still, use this detector with an existing S.A.V.C. system, some very happy results can be obtained.

There are two ways of using the valve, both of them incorporating the trailing screen principle. The first is the anode-bend detector and Fig. 3 shows a typical mains circuit using a self-biased arrangement. If the by-pass condenser across the cathode resistor is large

(a 25-microfarad electrolytic condenser is convenient), the response in the bass will be found to be particularly good.

The disadvantage of this circuit is that the upper frequencies tend to be cut off owing to the high value of anode resistance. The self-capacity of the circuit (including the

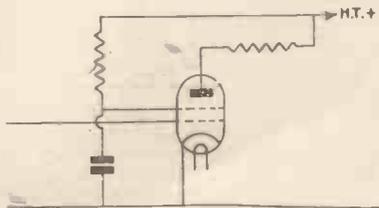


Fig. 1.—Floating or trailing screen, automatically adjusting to right voltage condition

Continued at foot of next page



Marconi photo

Captain C. T. P. Ulm in the wireless cabin of the Airspeed "Envoy", which has been built specially for him in England for his proposed trans-Pacific flight from Vancouver to Melbourne

Across the Pacific!

Details of the Transmitter and Receiver

VERY few long-distance flights to-day are attempted without the invaluable aid of wireless. That is why we are not surprised to learn of the elaborate arrangements made by Capt. C. T. P. Ulm for his proposed trans-Pacific flight.

Maintaining Contact

This well-known Australian airman has just had a complete Marconi equipment put into his plane—of a type that will enable him to maintain contact with both medium-wave and short-wave ship and shore stations. This will be a great aid in his Airspeed *Envoy* during his proposed flight from Vancouver to Melbourne.

In addition, Capt. Ulm is carrying a Marconi

Pacific crossing.

On the stage between Honolulu and Suva (Fiji Islands), for instance, the success of the flight is dependent upon his finding this comparatively minute point of land after flying over many hundreds of miles of ocean.

The wireless transmitting and receiving equipment is the combined medium and short-wave type A.D. 37/38 which is widely used on the Empire air routes and other long-distance airways.

The "homing" device is of a new type, known as the A.D.52, which incorporates an extra stage of high-frequency amplification and thus allows a smaller frame aerial to be employed.

The direction-finding frame aerial in Captain

"homing" device as an aid to navigation. This instrument, which enables a pilot in flight to steer a direct course towards any wireless transmitting station within its wave range, should be of particular value to Captain Ulm on the long and difficult

Ulm's *Envoy* is actually fitted round the fuselage, about two-thirds of the way between the nose and the tail.

Power for both the wireless equipment and for lighting the aircraft is obtained from a single combined high-tension and low-tension wind-driven generator.

The wireless equipment also includes an emergency short-wave transmitter, which is completely separate from the main wireless installation and is housed in the tail of the aircraft for safety in the event of alighting on the sea.

Captain Ulm's Object

The principal object of Captain Ulm's flight is to survey the air route between Honolulu and Australia with a British-built and British-equipped aircraft.

He has shipped the *Envoy* to Montreal and plans to fly across Canada to Vancouver. At the first suitable opportunity he will then take off for Australia by way of San Francisco, Honolulu, Suva (Fiji Islands), Auckland (New Zealand), and Sydney (New South Wales) to Melbourne.

Captain Ulm will be accompanied by Mr. G. M. Littlejohn, as second pilot, and Mr. J. L. Skilling as wireless operator.

Good flying to all of them!

Screen-grid Detector Ideas

Continued from preceding page

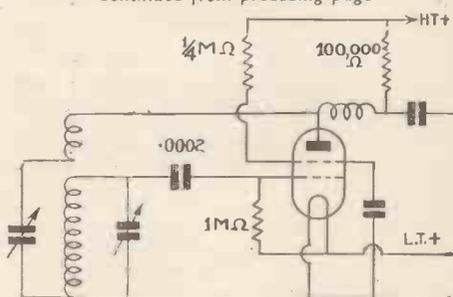


Fig. 5.—A battery circuit using a screen-grid detector in a very successful manner

effective grid capacity of the following valve, shunt the currents above a few thousand cycles to an increasing extent and high-note loss may be somewhat noticeable.

In any case, no bypass condenser should be used in the anode circuit. The main function of the bypass condenser in a detector stage is to avoid Miller effect, which is the additional damping introduced by feed-back from anode to grid inside the valve. In a screen-grid valve this capacity is reduced to negligible proportions and hence Miller effect is practically non-existent.

A further disadvantage which is a little more serious from the point of view of the experimenter is that reaction is difficult to obtain with this type of circuit. It is not that

the circuit will not oscillate. It is quite easy to achieve this by coupling the coil from the anode back to the grid in the usual way, but if one attempts to use this as a reaction control an unpleasant growl or squeal may be obtained just as the circuit goes into oscillation, so preventing it from being used in its most sensitive condition.

This is unfortunately unavoidable. As the signal strength is increased due to the reaction the anode current increases, causing the anode voltage to decrease. Hence at the point of oscillation the circuit first starts to oscillate and then is immediately checked by the drop in anode voltage so that it falls in and out of oscillation the whole time at a rapid rate, giving rise to the unpleasant "squegging," as it is called.

Anode Current Decreases

By using the valve as a grid detector this difficulty can be overcome because with a grid detector the anode current decreases as the signal increases. The same limiting action is obtained but the values of anode and screen resistor have to be lower. Fig. 4 shows a circuit of this type with a reaction control incorporated. This particular form of circuit is very pleasing to operate. It may be used with either mains or battery valves and Fig. 5 shows a battery circuit.

The disadvantage of the grid detector arrangement is that damping is imposed on the circuit so that the tuning is not quite as sharp. The loss introduced is not as serious as with the ordinary grid detector because there is no Miller effect, but the anode-bend version of

Fig. 3 introduces practically no damping at all, which makes quite a difference to the selectivity.

A difficulty with the usual grid-detector arrangement is that the carrier voltage, being usually two or three times greater than the low-frequency modulation (the two, of course, are equal at 100 per cent. modulation), is liable to overload the valve before the full low-frequency output can be obtained. This gives an unpleasant limiting action (see Fig. 6) which is not the same as the screen limiting which we are using because it introduces distortion.

With the screen-grid detector, however, this effect is not so serious because it is usually possible to obtain all the output required before the carrier overloading sets in.

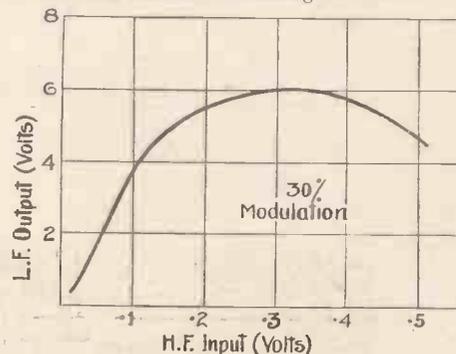


Fig. 6.—Typical screen-grid detector curve showing the effect of the limiting action referred to in the article

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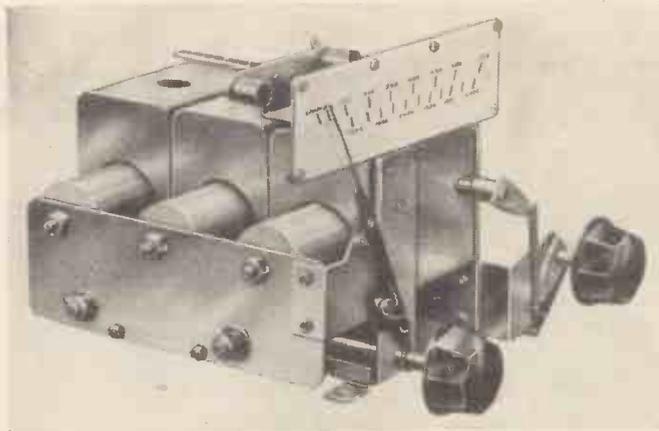
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WE have become so accustomed to tuning receivers by means of variable condensers that we have rather lost sight of other methods; in fact, comparative newcomers to radio as a hobby may never have seen any other method employed.

Those who have been in the game some time will remember the old solenoid coils, sometimes over a foot long, with sliding contacts for varying the number of turns in circuit, whilst later on variometers, consisting of two coils, one rotating within the other, were employed.

Demands for One Knob

Both of these methods were rather inefficient and when the demand for single-dial tuning came along they were rapidly superseded by the variable-condenser method of tuning, in which a fixed inductance in parallel with a variable capacity is employed to enable the resonant frequency of the circuit to be varied.

This method has been developed to a very high degree, and to-day it is possible to purchase ganged condensers in which the sections are matched to within plus or minus one-half per cent., whilst the coils are also matched to the same degree of accuracy.

Certain Disadvantages

Although the condenser method of tuning has been developed to this high degree, there are certain physical properties of this method which prevent it from fulfilling a conception of the ideal method of tuning.

Most of us are familiar with the shape of the resonance curve of a tuned circuit. Suppose we take an ordinary tuned circuit and couple it to an oscillator giving a constant output and tune the oscillator through the resonant frequency of the circuit.

Across the tuned circuit we connect a valve voltmeter and plot the readings of this against the oscillator frequency.

We should get a curve like Fig. 1, the maximum voltage being obtained when the oscillator is tuned to the resonant frequency of the circuit, with a gradual falling off on either side.

Now we know that this falling off on either side means that the high musical frequencies in a transmission are not reproduced at their proper strength, due to the "side-band cutting" as it is

tuned circuits as a band-pass filter.

Unfortunately this is not the whole story, because the shape of the resonance curve, when condenser tuning is used as is generally the case, is not the same at all wavelengths.

For example, if at a low wavelength, say 200 metres, supposing we found that at the resonant point we got a reading of 1 volt, and at a frequency of 5 kilocycles lower we obtained .5 volt (Fig. 2), this would mean that a 5,000-cycle note is reproduced at what is really only half its proper strength.

Now increase the capacity across the tuned circuit and tune it to 500 metres and again vary the oscillator tuning, this time above and below 500 metres.

We should now find that the reading 5 kilocycles above or below resonance was less than one-half the resonance value, in fact with typical tuned circuits it would be nearer one-quarter of the resonance value.

We see at once that the quality will vary considerably, and a fixed tone corrector or constant peak band-pass system may not be satisfactory with this method of tuning.

It will also be noticed that the height of the curve for 500 metres is less than for 200 metres, showing that the amplification is reduced as the wavelength is increased. By a suitable choice of circuit one of these objections can be overcome, but the other then becomes worse than before.

Of course, with several circuits following one another the difference in performance as the wavelength varies becomes more marked. Referring to Fig. 2, the width of the curve at half the maximum height is known as the band

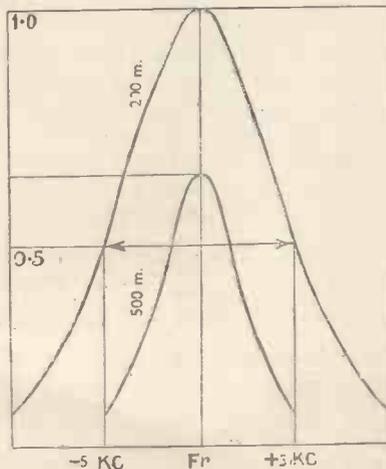


Fig. 2.—The width of the curve at half the maximum height is known as the band width

Tuning without a Condenser

Advantages of the Permeability Method Examined

called, of the tuned circuits.

We also know that we can put a correcting circuit in the low-frequency amplifier to compensate for this, or we can use two

width. In this case it is 10 kilocycles.

It can be shown mathematically that for the band width to remain constant the ratio of the inductance to the resistance must also be constant. With condenser tuning the inductance L is fixed, the capacity is varied, and the resistance R varies with the wavelength so that the above condition cannot be entirely fulfilled.

Effect of Fixing Capacity

Now suppose that we keep the capacity fixed, and vary L .

At low wavelengths only a small inductance is required having a correspondingly small resistance. To tune to higher wavelengths more inductance is required, with a corresponding increase in resistance, so that the ratio of L to R tends to remain more nearly constant. From this it seems that inductance tuning may be at least a step in the right direction.

It is found that variometer and tap-switch methods of varying the inductance are not suitable, but there is another method which has recently become available.

The iron-core coil is well known now, and it must have occurred to many that by sliding the iron core in and out the inductance could be varied—so altering the tuning.

This method is known as permeability tuning. With the usual type of core used in these coils the range of inductance variation would not be great enough to cover the waveband required, and the ratio of L to R would not remain constant.

It is necessary to use cores and coils of a special shape and type. Such as the new Varley type. The coil is wound on a tapered former, and the iron core is in the form of a tube with one end closed and a tapered centre rod, something like an old-type moving-coil speaker magnet in shape. The core is carried on a plate controlled by a driving mechanism which causes the core to move to and fro, so enclosing the coil in the iron circuit.

Simultaneous Variation

Several such core-and-coil assemblies can be mounted in line, all the cores being carried on the same plate, so that the circuits are all varied simultaneously.

Another winding is carried on a former placed outside the core. This winding can be used for aerial coupling, reaction, or as the primary winding of a high-frequency transformer. The tuned circuit constructed in this manner has an almost constant ratio of inductance to resistance, so that the selectivity, quality and amplification of the receiver remains practically constant at all wavelengths.

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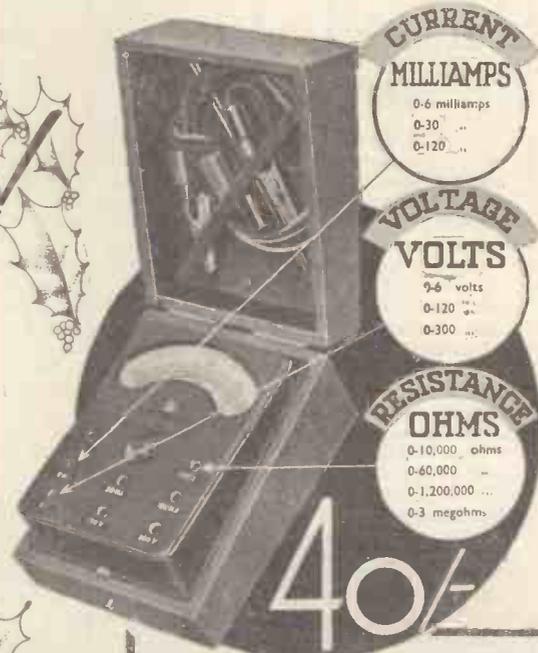
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Christmas Radio "Milestones"

A GOOD many of the milestones in the history of broadcasting have been set up at Christmas time.

The first radio Christmas for broadcast listeners was, of course, Christmas 1922. That year, on Christmas Eve, the B.B.C.'s Newcastle station gave its first programme—from a stable-yard, with the transmitting apparatus in a motor-lorry and the aerial slung up to an adjacent factory chimney.

Christmas Eve 1922 might also be said to have marked the beginning of radio preaching and radio plays. On that day, listeners to 2LO heard the first broadcast religious address given by the Rev. John Mayo, Vicar of Whitechapel.

Christmas time in the following year saw the first transatlantic broadcast relay. The B.B.C.'s receiving station at Biggin Hill picked up KDKA on about 60 metres and relayed the resulting noises to B.B.C. listeners over the S.B. system. Faint and intermittent strains of music fought valiantly to make headway against a devastating background (or rather foreground) of crackles.

More recent Christmases have seen the first broadcasts of programme features destined to become annual events: the Nativity Play from the little church of St. Hilary in Cornwall; the carol-services from St. Mary's, Whitechapel and King's College, Cambridge; and so on.

Christmas Day, 1932 saw an outstanding event that will long be remembered by listeners to the Empire station; namely, the first broadcasting through the Daventry short-wave transmitters of H.M. the King's Christmas message of greeting to the Empire.

Last Christmas another milestone was set up by a remarkable technical feat in the form of the first broadcast of the bells from Bethlehem.

Be Ready for Radio Emergencies!

A SET that has been working splendidly throughout the year may choose to break down right at the peak of the Christmas festivities—apparently out of sheer perversity.

This unwelcome contingency can be guarded against to a great extent if you are prepared for it and take a few precautions. Forewarned is forearmed!

The best plan is to go over the whole installation thoroughly a few days before the holidays, so that you can get any necessary replacements or spare accessories in hand before the shops close and the fun begins.

In looking over the set and its accessories, ask yourself the following questions:—

Is the aerial O.K., earthing-switch contacts free from corrosion, insulators free from sooty deposit, and halyards sound?

Is the earth connection in order?

How long have the valves been in use—are they nearing the end of their useful life and likely to let you down unexpectedly?

Do the high-tension or grid-bias batteries need replacement? Is the accumulator charged up, and is a spare one available if the one at present in use runs down? Had you better get an extra accumulator on loan or hire, as a stand-by during the holidays?

Are all terminals well tightened up, connections clean and wiring sound? Are any of the flex leads worn and on the point of breaking?

Are all moving parts working smoothly and accurately? Do any switch contact-springs need cleaning or tightening?

Have you spare fuses available for use in the set if the existing ones "blow" unexpectedly? Have you a supply of suitable fuse wire in the house to replace the mains fuses if they "blow"?

Short-wave Notes

By KENNETH
JOWERS

IT did not surprise me to find that the majority of listeners experienced considerable difficulty in picking up DX stations during the past week. The trouble has been not so much poor conditions but that the best listening periods have been during the afternoon, when most of you are working, and round about midnight, which is rather too late for general listening.

20-metre telephone stations have been fading out a little after 1800, while the Americans on 40 metres have not been too reliable and have not started coming over until about 0100. B. McDougall, of Glasgow, mentions that on Sunday morning the G stations are coming in very well, even though he is only using a two-valve receiver with a low-frequency valve in the power stage.

Amongst the stations heard on the 40-metre band, all using telephone, were G5CB, G5LC, G5XB, G5YL, G5ML.

LA1BC, of Norway, ON4SL, of Belgium, and ON4AD were also logged. Strangely enough, interference was not bad in the Glasgow area, although in the South of England the 40-metre band was almost blotted out by mutual interference between stations.

Porto Rico Again

A. J. West, of Merton, S.W.19, tells me that K4SA; Porto Rico is coming in again. This is rather extraordinary, for in a letter from K4SA he told me that he would be off the air until the early part of 1935.

Mr. West would like to get in touch with other amateurs to swap notes and experiences

on short-wave topics, so please oblige.

B.R.S.1287, F. G. Sadler, of Stamford Hill, tells me that on 20 metres he has logged W3AFW, W2EDW, W2AND, W8EOU, W3ZX and the Cuban CM2MA. All used telephone and were logged between 1600 and 1830 G.M.T.

On 40 metres he logged ON4PA, ON4AP, F8JS, PA00AK, LA3G, CT1AH, HB9AG, ON4RP, and, of course, the usual G stations. The receiver in use is a simple two-valver with an aerial 30 ft. long and "stuck" to the wall outside between two windows.

Telephone Stations Poor

Martin Railton, B.R.S.1605, also finds that telephone stations are coming in very poorly. His star station for the week is VP3E on 40 metres. Most of the stations logged were using continuous-wave, which more or less bears out the results that I have obtained.

Of the continuous-wave stations heard on 20 metres, the best were ZT6A, SM5WM, YL2BQ, U3BI, D4DBO, D4BGA. On 40 metres SU1SG, OH1JE, CT1ED, EA5BS, K4BR, SP1AT, SP1GZ, were all logged at good strength.

Robert Everard, of Standon, Herts, is still doing very well indeed. He has heard sixty-two stations on 20 metres, and a considerable number on 40 and 75 metres. Mr. Everard finds at the moment that conditions are favourable for ninth district stations on 20 metres, although the rest of 20-metre band is completely dead after 1800.

Now Try an Indoor Aerial!

WITH so many powerful stations and such sensitive sets an indoor aerial is often more than enough to give you a full range of alternative programmes from abroad.

This being so, the latest commercial indoor aerials are of great interest. Take, for example, the Amplion Plastape, which is a flat-fitting, self-moulding wire.

This has ten copper conductors spaced evenly between three insulating tapes—altogether 300 ft. of wire in a convenient 30 ft. length.

Three colours of covering are available—buff, grey, and red. The 30 ft. length is 3s. 6d., the 20 ft. length is 2s. 6d., and the 15 ft. length is 2s. The makers are Amplion (1932), Ltd.

Another very useful indoor aerial is the well-known Pix, known as the invisible aerial because it is in the form of a neutral-tinted self-adhesive fabric strip carrying an insulated aluminium conductor $\frac{1}{4}$ in. wide.

By a new patent rubber compound the tape is permanently sticky, so that it can be removed from one part of the room to another if desired.

The standard length is 30 ft., of which the price is 2s. In a double length the price is 3s. 6d., and this the makers recommend to be run up to the highest point in the house—when it is claimed to be the equal of the full outside aerial now dubbed old-fashioned.

As the makers suggest, another length can be used as a counterpoise earth—especially where difficulty is found in fitting a good earth.

The makers are the British Pix Co., Ltd.

Gramophone Records Given Away!

A NOVEL competition is announced by the manufacturers of the famous Triotron Valves. A special gramophone record has been made of *The Blue Danube* played by the Triotron Orchestra, and these records are being distributed free in exchange for a coupon printed in the Triotron valve advertisements.

The competition consists of identifying the number of instruments used by the orchestra in making this record. Competitors are also asked to write a twenty-word opinion of Triotron Valves. More than fifty prizes (amounting to £100 in all) will be awarded.

Counting the instruments is an amusing pastime and ought to provide a lot of fun at Christmas parties.

Radio (and the radio-gramophone) has become an essential feature at every fireside nowadays and up-to-date sets give a degree of perfection in reproduction that was unknown a few years ago.

Probably the most vital part of any set is the valves, and it is quite surprising what an improvement can be made by replacing old valves with new ones. Not only do valves deteriorate after a few years' use, but the improvements in valve efficiency and design that are continually being made will well repay in improved quality the moderate outlay involved in changing over to new valves.

Included among the valves that have been improved by the new developments are, of course, the Triotron range, and the Triotron Technical Service department is offering free advice on any radio problem free of all charge to our readers.

Readers' Views on This and That

Listeners' Letters

Luxembourg Effect

To the Editor of AMATEUR WIRELESS.

YOUR item in recent issue "News and Gossip" section on "Luxembourg" effect is most interesting.

I can only suggest the B.B.C. check up their equipment and note if there is not some induction effect somewhere.

The trouble is noticeable on all Regional transmissions at times, and is particularly bad to-night on North, Midland, Scottish, and London stations, but I am unable to find a trace on Belfast.

West Regional service is so bad after darkness has set in, that it is difficult to check up on this transmitter. M. H. TRETWEY.
19 Leskinnick Terrace, Penzance. [1163]

Modern Neutralised Circuits

THANK you very much for a most interesting article.

I am of the opinion (after using both S.G. and neutralised circuits for the past six years) that a neutralised circuit, say of five valves, constructed with modern components, would be more efficient than a screen-grid circuit using the same number of valves.

Would it be asking too great a favour? Please give us a set and let us see for ourselves. Thanking you once again. F. COLOMBI.
(for) The Myddelton Radio Club.
26 Myddelton Street, E.C.1. [1164]

All-Britain AC/DC Three

I RECENTLY built the All-Britain A.C./D.C. Three, which I intended to use off A.C. mains. On switching on the set first time, I found it rather unselective, but upon the addition of a .0003-microfarad mica di-electric condenser in series with the aerial, the set became wonderfully selective—so much so that on a single strand of wire of about 30 feet in length around my living room I am now able to get at least thirty stations.

There was still, I found, a slight hum due to the mains in this district being rather bad, but on putting a .1-microfarad condenser from the anode of the rectifier valve to earth and a small aluminium screen between the rectifier valve and the other three valves, this hum was completely eliminated.

Needless to say, I am extremely satisfied with the set, and as it is quite near Christmas, allow me to offer the Editor and Staff the best of Christmas wishes. D. W. S.
Boston Manor, Middlesex. [1165]

Next Week!

For the benefit of those who propose building one of the Goodwill sets described in this issue we shall be publishing some further useful notes next week. These self-contained battery and mains designs are very easy to operate, as will be fully explained next week.

Owing to pressure on our space this week we have had to hold over the second article on the short-wave Adaptor/Converter. Next week, therefore, we shall publish full details on how to use this very efficient little unit as a complete one-valver for short-wave reception.

AT LAST a High Efficiency Pick-up AT YOUR PRICE



Now comes a big Graham Farish surprise . . . a high-efficiency Gramophone PICK-UP at half the price you'd expect! Fourteen and sixpence only, yet in performance, output, design and finish the GRAHAM FARISH PICK-UP invites comparison with any on the market. Fit one in time for the Christmas festivities, it will give your records a new interest. But to avoid disappointment order NOW, such big value is certain to create a big demand.

GRAHAM FARISH PICK-UP & TONEARM

Gives undistorted reproduction of remarkable purity and a high voltage output. The finest tonal shading is rendered with total absence of resonance even at full volume. Reduces record wear to vanishing point. Beautifully finished in polished Walnut Bakelite complete with simple wiring instructions for connecting to all-mains and battery sets, 14/6. Volume Control (50,000 ohms) if required 2/9.

Ask your dealer to demonstrate.

ADVERTISEMENT OF GRAHAM FARISH LTD., MASONS HILL, BROMLEY, KENT

Radio Gifts Will Be the Fashion (Continued from page 603)

operated, since no mains are available, and its cost need be no more than a few pounds.

But I can tell you, from experience of my own, that its value to the recipient is far beyond its price. Not long ago I sent such a set to a relative of mine who is stationed miles from anywhere in one of the least populated parts of India. It is quite a small set: just a straight four-valver, but it keeps him directly in touch not only with the whole country, but with half the world as well.

Every evening he receives the Empire programme from the Daventry short-wave station with its news and entertainment from home. He hears, too, quite a few of the medium-wave European stations, as well as short-wave transmissions from Europe, the Far East, America, and Australia. Every letter that I have had since he received the set has

been brimming over with enthusiasm for the wireless set.

There is no difficulty about sending complete wireless sets or similar pieces of apparatus to any part of the Empire. Manufacturers have export departments which will undertake proper packing and all formalities of shipment and so on.

Good Packing Needed

The packing has to be good, and when I mention that the set I have just been speaking about arrived intact to the last filament, after a journey of six thousand miles by sea, a thousand odd miles by rail, and a hundred or so by lorry over the roughest roads imaginable, you will see that the makers know pretty well what's needed.

More Crusader "Wants"

NOT a post goes by now without some further request from a Crusader for a specialised kind of set. We shall have to go into *daily* publication if we are to get through only a fraction of the "wants" that are being expressed.

Let us quote you, dear Crusaders, and that will show what a wide divergence of tastes there is among you.

A Super-het Special

"I note," begins CC1356, "that it is generally decided the next set will be a super-het special." Oh, indeed? Well, there's nothing like the wish being the father to the fact.

"Why not go one further and let us have an all-wave super-het?" queries this Crusader. "By using an efficient converter built in on the high-frequency chassis the necessary ganged switches could be on the front panel."

He goes on to suggest that a set of this type would find favour with a great many fans. Would it? Let us have your views, fans!

Very Keen Crusader

A rough outline of a suitable sequence of valves is drawn up, and the Crusader promises further details later. He is one of our keenest fans, and we would very much like to give him what he wants if at all possible.

As a last hint, CC1356 wants us to give maximum current figures for mains sets, so that the running costs can be worked out. This is quite easy—but we question whether it is really essential, as in any case the extra drain on the supply is too small to make any material difference to the bill at the end of the quarter.



This is what the Crusader badge design is like—you can obtain the badge from us, price 1s., post paid

"Personally, I would be glad to know that you had decided to make the next Crusader set a real quality set," opines a Whyte-leave entrant to the Crusade, "designed on the lines of the Noel Bonavia-Hunt ideas recently published."

Quality Circuit

"I am the more anxious to construct such a set because my present one has gone all to pieces, and as it is also very unselective. I feel that I shall get no satisfaction until a more up-to-date circuit comes along—a real quality circuit."

There speaks the real quality fan—and he does not speak alone. More and more we find there is a tendency to place quality of reproduction from a reasonable number of stations above considerations of stupendously large logs.

Yes, certainly, the question of good quality must now be taken more fully into account when we design sets for discerning Crusaders.

"Having been interested in the construction of wireless sets for ten years, I find that the need of a real Crusade is in the short-wave field," says a Derby member.

"I have experimented on these lines for the past seven years, and am as far from finality now as I was at the beginning."

Joy of this Wireless

Well, and aren't we all? That is the joy of this wireless game—there is no *finale*.

"Here is what I consider a really efficient short-wave set," goes on J. E. H., of Derby. "An untuned screen-grid stage coupled to a leaky-grid detector. Detector with grid-leak potentiometer. Parallel-feed low-frequency stage coupled to a pentode output valve. As for the construction, it should be a panel-and-baseboard set, metal panel and metallised baseboard, with standard components."

This keen short-wave fan ends up with a German greeting—shades of, well, what do you think?

Now for a comment looking backwards a bit. "I have just built your AVC4," says a Plymouth Crusader, "and find that it is a good set, bringing in many stations, even here, and the A.V.C. really does work."

This reader goes on about quality—and is not satisfied with what he obtained from the AVC4. Another department has dealt with his points—but it does show that this quality question is getting uppermost in the thoughts of the majority of constructors—including nearly all Crusaders.

Constructor Crusaders

Get Four Full-size Blueprints Free!

THE PRIVILEGES OF MEMBERSHIP

- 1.—Immediately on enrolment every Constructor Crusader receives free full-size photographic blueprints of the All-Britain Three (described October 6, 1934) and of the Crusaders' A.V.C.4 (published on August 18). He will also receive a free blueprint, immediately on publication, of the two "Amateur Wireless" star sets to be released on 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:

December 8, 1934

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in the

CHRISTMAS ISSUE

IN the Christmas issue of RADIO PICTORIAL, which is on sale this Friday, December 7, there is a very simple competition for the solving of which the above prizes are offered. If you fail to win a cash prize, you will certainly find the records very useful over the Christmas holidays.

The Christmas Number has been greatly enlarged and is packed full of splendid articles and pictures. For example there are:

Articles by

HENRY HALL

CHRISTOPHER STONE

MABEL CONSTANDUROS

ASHLEY STERNE

Full page portraits of

GRACIE FIELDS

CHARLIE KUNZ

There is also included amongst its fifty-six pages eight pages of information of next week's programmes from **Radio Luxembourg, Radio Normandy, Paris (Poste Parisien)**, and many other Continental stations.

ORDER YOUR COPY NOW. There is sure to be a tremendous demand for this bumper Christmas Number.

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A few illustrations of the many uses of the 4S TOOL

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A young listener tries out the R.I. Ritz Airflo model. Note that the controls are on the right of the cabinet, leaving the front quite clean

THIS set, as you see, has a most aristocratic name; and there is no doubt that it is a leader in its class. One's immediate reaction on handling the set for the first time can be summed up in the expression: "Well, here's something really substantial for once." There is nothing flimsy about the design; the cabinet is a solid job with a fine finish and the chassis will bear the closest scrutiny.

There is no secret about the fact that the set has been designed by W. James, who has produced so many successful receivers for the home constructor through the medium of AMATEUR WIRELESS and *Wireless Magazine*. He is equally successful now that he has turned his attention to the complete commercial product.

Four Most Efficient Valves

The Airflo set uses four of the most efficient valves now being made, and its performance is equivalent to that of at least a six-valver. Note that the first valve is a two-in-one type—a triode and a high-frequency pentode combined—and that the second detector is a four-in-one model—a triode in combination with no fewer than three diodes. It is in this valve that one of the secrets of the set's success lies, as we will now reveal.

One of the greatest bugbears of modern reception is atmospheric and local interference caused by electrical apparatus; Mr. James set out to overcome these troubles in a novel way.

In brief, what he does is to put a big bias voltage on one of the diodes of the second detector when it is desired to cut out extraneous noises. Suppose that the diode is biased 40 volts negative. It obviously follows that no signal that is not amplified up to more than 40 volts on the second detector will be heard at all.

Reception without "Background"

It might be thought that practically no stations come up to that value, but tests on a rather poor indoor aerial on the outskirts of London show conclusively that a great number of stations can be received under these conditions—and noisy background is simply cut out altogether.

Indeed, this set is ideal for the flat dweller who suffers from noisy vacuum cleaners, refrigerators, etc., used by neighbours. This interference-eliminating device is one of the most revolutionary and effective features in a modern set that we have come across.

But there is not always interference to be blotted out, so a switch is provided to remove the bias from the diode at will, when the set functions as a perfectly normal super-het, and

R.I. Ritz Airflo Super-het

brings in everything that is going, background and all.

Amplified self-adjusting volume control is provided and the regulation given by this is very much better than with a good many present-day sets. This feature is in action all the time, whether the interference-eliminating device is in use or not.

Another high spot of the design is the "airflo" principle. The baffleboard on which the loud-speaker (a Rola, by the way) is mounted is not flush with the front part of the cabinet, but is recessed back some two or three inches.

One is at first suspicious of the claims made that the free flow of air round the front of the loud-speaker could have any detectable effect on the reproduction, but the fact remains that it does. The quality is notably clean and bright, although there is no lack of bass response; the "airflo" cabinet gives much better reproduction than when the same chassis and loud-speaker are used in a different type of case, as we heard for ourselves.

A continuously variable tone control is provided so that the listener can adjust the reproduction to suit his own tastes. This control is very useful, of course, for cutting out the few heterodyne whistles that cannot be eliminated by ordinary tuning.

It will be noted from the photographs that the front of the set is free of all knobs. This is a feature that pleased us; it makes the set particularly neat in appearance and there is no difficulty at all about getting at the controls, which are recessed slightly at the right-hand side of the set. The wrist action involved in tuning is quite natural.

There are four knobs at the side, arranged in two rows of two. The first knob one's hand contacts at the top is the main tuning control; this operates a large-size drum drive provided with a transparent tuning scale.

The latter is coloured brown, to match the woodwork, with the names of medium-wave stations in white and the names of long-wave stations in red; the usual dial light throws these names into prominence as soon as the set is switched on.

Farther back than the tuning control is the combined on-off switch and volume control. The only comments to be made about this are that it is a low-frequency control acting both for radio and gramophone-record reproduction (the usual pick-up sockets are provided) and that its setting is not affected in the slightest by the operation of the interference-eliminating control.

BRIEF SPECIFICATION

Brand Name : R.I.

Model : Ritz Airflo.

Price : £16 16s.

Technical Specification : Four-valve super-het (five including mains rectifier). Triode-pentode combined first detector/oscillator (Mazda AC/TP), intermediate-frequency amplifier (Mazda AC/VP1), triple-diode-triode, second detector (Mazda AC/HL/DDD), output pentode (Mazda AC/PEN); mains rectifier (Mullard IW3).

Power Supply : A.C. mains, 200-250 volts, 50-100 cycles.

Makers : Radio Instruments, Ltd., Purley Way, Croydon, Surrey.

Immediately under the main tuning knob is the wavechange grammo-radio switch, marked with the letters "M" for medium waves, "L" for long waves, and "G" for record reproduction.

Under the volume control is the interference-eliminating control, called by the makers the "pre-selector noise control." When this knob is turned as far as possible to the right, the set works as a straightforward super-het, but immediately it is turned to the left, a switch is operated and the second detector is biased so that signals below a certain strength are not heard at all; this also means that nearly all interfering noises are cut right out. Powerful good-quality stations are then received without any background.

As the knob is turned to the left, a potentiometer increases the bias—thus progressively restricting the number of stations, but also making the background more and more silent.

Two Interesting Effects

Two interesting effects are to be observed when this control is in use. If a station that is fading really badly is just brought in at a particular setting of the potentiometer it will go right off altogether as soon as the strength fades below the bias voltage applied at the moment. This effect, by the way, cannot be interpreted in any detrimental sense; it proves that the interference-eliminating device is working as it should.

The second effect is that tuning is apparently sharpened. This is obvious when it is remembered that as soon as the resonance curve (at the second detector) falls below the value of bias applied to the valve, the diode is not "triggered" and nothing at all is heard.

Two other features that must be mentioned to make our report complete are the provision of a mains-aerial device (some ten to fifteen



The recessed baffleboard is clearly seen in this view of the set, which is particularly well constructed

stations were received at good strength) and sockets for the addition of an external loud-speaker.

In conclusion, we have no hesitation in saying (after a test lasting for more than a fortnight in a flat where electrical interference is particularly bad) that this set merits very serious consideration by those who want a handsome receiver that will bring in a really good selection of stations at exceptional quality.

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 - L.2. Low Frequency Amplifier.
 - L.P.2. Low Consumption small power.
 - P.2. Power (suitable in 2nd L.F. stage).
 - S.P.2. Super Power.
 - P.T.2. Pentode.
 - S.2. Screen-grid H.F. Amplifier and Det.

- INDIRECTLY HEATED A.C. VALVES**
- AC/HL. A.C. Detector and Triode Amplifier.
 - AC/S. A.C. Screen Grid H.F.
 - AC/VS. A.C. Variable Mu.
 - AC/PT. A.C. Pentode.
 - AC/P. A.C. Power.

- RECTIFYING VALVE**
- FW.350. Full Wave Rectifier (output 300 volts, 80 milliamperes).

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The Amplification of Photo-electric Currents.
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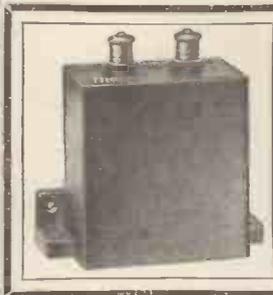
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All Condensers except tubular are fitted with fixing feet and screw terminals or soldering tags. All B.I. Wireless Condensers are vacuum dried and impregnated with a specially selected non-hygroscopic material which ensures that their initial insulation value is maintained indefinitely. All Condensers are tested before dispatch at three times working pressure and the actual capacity is guaranteed to be correct within 10 per cent., except that of the tubular type, which is guaranteed within 15 per cent.



In addition to the Standard Types, B.I. Condensers can be supplied in special forms to suit requirements.



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The task of Santa Claus is not too onerous in 1934—trying out a Cosor radio-gramophone

HAVEN'T you ever stood in front of a radio shop window and thought: "I should like that gadget! But of course it's not really a necessity, so I suppose I ought to be economical and do without it." And haven't you been pleased if someone has unexpectedly given you the very thing you wanted but hesitated to buy yourself?

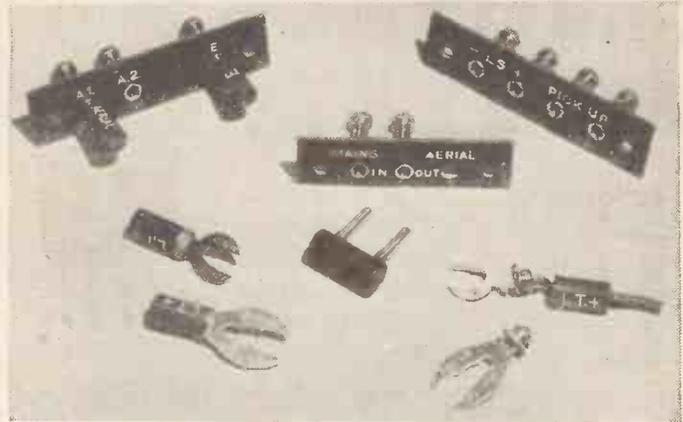
Of course you have. And you can depend upon it that other people feel much the same as you do. The gifts that the majority of us appreciate most, as a rule, are the little luxuries we

Give Them Radio

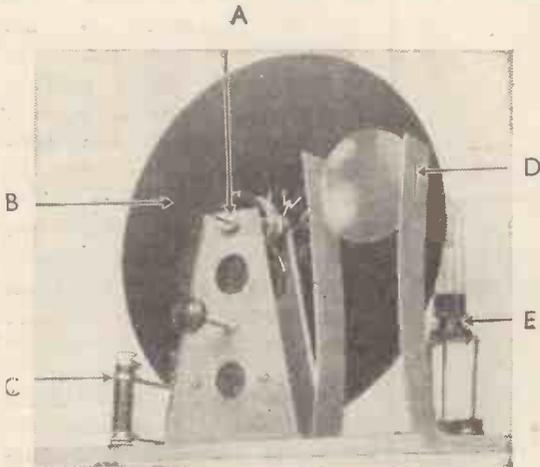
By
W.
OLIVER

These mixed knobs serve their purpose all right, of course; but how much better the receiver would look with a set of knobs that matched. The best types cost only a few pence each, so, unless your friend's set has an outrageous number of knobs on it, you can rig him out with new ones for a shilling or two.

There are just two points to find out before-



Any constructor would be glad to have a collection of such safety connectors as these Clix gadgets which have a very wide variety of uses



Wolsey television kit: A, motor pivot; B, scanning disc; C, mains-resistances; D, lens; and E, lamp holder



You can have lots of fun with a mine: here is the model made by London and Provincial Factors

hand: first, whether your friend has a preference for hexagonal, octagonal, or round knobs; and second, the sizes of the spindles in his set. They may all be a 1/4 inch in diameter, or you may find that some of them are of the three-sixteenths type.

If some of the spindles do not project much in front of the panel, it will be necessary to choose knobs with grub-screws set near the inner edge, otherwise they will not grip.

Indoor Aerial?

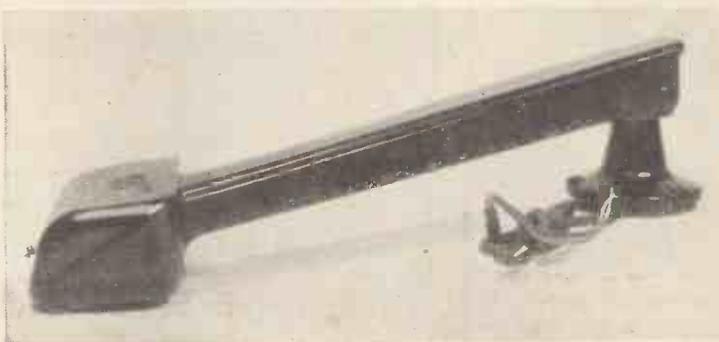
Now for another idea. Does your friend use an indoor aerial? If so, you may find that it is rather a makeshift affair—just a length of flex slung around the picture-rail, perhaps. No doubt this works reasonably well; but one of the neat and ingenious types of indoor aerials on sale at quite modest prices should ensure better results as well as greatly improved appearance.

want but feel we ought not to buy, because they are not absolutely essential to the working of our sets.

So there you have a key to the art of giving really acceptable radio gifts! Choose little luxuries that will raise an ordinary set above the level of mediocrity, or will make a fine set better still.

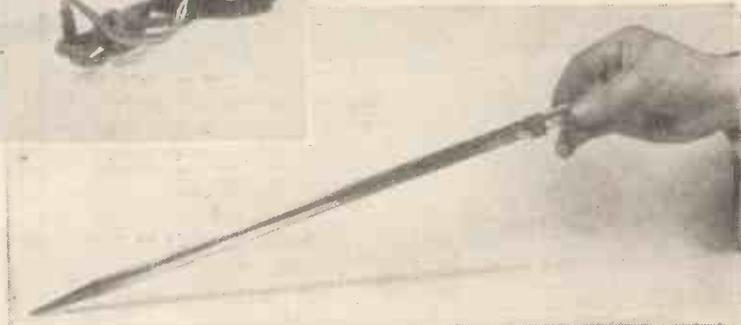
Here are a few practical suggestions to help you in your choice.

First an inexpensive gift for a friend with a home-built set. In all probability that set is adorned with a mixed collection of control-knobs, no two of which are quite alike!



(Above) This well-made pick-up has just been released by Graham Farish at 14s. 6d.

(Right) Is it time you had a new ear! Try the Anacos solid-copper rod



Luxuries!

Anti-lightning protection devices are among the gadgets that many listeners are apt to regard as "inessential" "frills." It is true, of course, that the risk of an aerial getting struck by lightning is so remote as to be negligible. But in spite of this it is very desirable, with an outdoor aerial, to have some sort of spark gap or earthing switch (or preferably both) that will prevent the wire getting charged up in thundery weather, with the possibility of damage to the set.

There are several excellent types of earthing switches to choose from; the best are combined with some sort of lightning "arrestor" or spark-gap to discharge the aerial when not connected direct to earth. To avoid the risk of poor contact that may occur through corrosion of the metal surfaces after exposure to the weather, the switch should be of a type that is suitably protected to make it as weatherproof as possible.

Earth Switches That Indicate

Earthing switches of the "indicator" type are useful in showing at a glance whether the aerial is earthed or not.

Among accessories for the "gramo" side of a radiogram, there is plenty of scope for choosing "luxury" gifts (although here, as elsewhere, one man's luxury is probably another man's necessity!).

Perhaps you have a friend with a home-built radiogram who persists in fishing new needles one by one out of the box in which they are sold (occasionally upsetting the whole lot on the carpet, of course), and is perhaps in the even worse habit of surreptitiously slipping used needles into the nearest flower-vase.

Why not cure him of these short-comings by making him a present of a nice pair of gramophone needle-bowls? There are various types at varying prices. The cheapest, of course, consist only of the bowls themselves (with one lid) which have to be sunk into the motorboard by boring two holes of suitable diameter and pressing the bowls into them.

The more elaborate types, however, with metal bowls ready mounted in a decorative bakelite moulding which enhances the appearance of the radiogram, are the easiest to fit to an existing motorboard.

A neat little motorboard light, to facilitate changing needles, placing the needle on the record, and so on; or a scratch-filter for eliminating needle-scratch, are two other useful gifts in the radiogram category.

If you are looking for a more expensive present in this connection, why not give a mains-driven gramophone motor to take the place of a spring-driven one? This gift would be appreciated by any friend with electricity laid on in the house.

Luxury Record Playing

Although you may be depriving your friend of a form of exercise which helps to develop the muscles in his right arm, he will feel amply compensated by the luxury of being able to play record after record without winding the motor.

The type of mains supply available—whether A.C. or D.C. and so on—needs to be taken into consideration when choosing the new motor.

Amongst other kinds of mains apparatus there are radio presents in plenty. A good many of these are safety devices of various types. It is certainly pleasant to feel that one's set is perfectly safe for use by non-technical members of the household, and this wide margin of safety can be attained by the use of the ingenious safety plug connectors, etc., now on the market.

AGAIN

EXCLUSIVELY

SPECIFIED BY "AMATEUR WIRELESS"

— WHY ?



Model P.M.S1

What Mr. A. K. JOWERS ("Amateur Wireless") says:

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Read what some users say:

"I was, and still am, amazed at the all-round supremacy of the STENTORIAN Senior. It definitely gives greater volume and better tone balance than any I have heard."
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"The sensitivity is enormous, the quality beautiful, and bass response is perfect." A. E. G., Edmonton.

"Your advertisements in no way exaggerate the superiority of STENTORIAN Speakers."
C. A. N., New Milton.

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- New Whiteley Speech Coil brings amazingly crisp attack and better bass response.
- Improved "Microlode" feature provides really accurate matching to the individual set.



Stentorian Senior (PMS1), 42/-.

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THE "Electromicro" Microphone for Home Broadcasting comes to you ready for immediate use with your radio set. Stage your own broadcast programme by having your artistes in a room adjacent to the sitting-room occupied by your visitors.

THIS excellent gift is illustrated in the Editor's Christmas Gift pages of this issue of "Amateur Wireless." In addition to creating amusement, it is perfect for experimental work and can be put to many uses. Simple instructions for use sent with every "Electromicro."

HERE is a gift which will bring enjoyment to the whole family and your friends.

THE "ELECTROMICRO"

A British made table microphone, complete with transformer enclosed in base.

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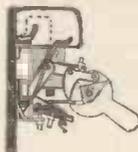
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15 amps., 14/- Also D.P. and 3-pole. Convert to remote control. Hand switches for arcs, D.C., change-over, 50 amps. **15/-**

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DYNAMOS: An entirely special production in enclosed L.T. slow speed generators for charging, etc. Completely enclosed, shunt, ball-bearings, 1,500 revs., 16 to 18 volts, 10 amps. D.C., with pulley and 12 months' guarantee, for 25/-.

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EDISON STEEL CELLS. We have some of these high capacity discharge cells cheap up to 400 a.h.

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Phone: Central 4611.

Our Review of Records

I AM simply itching to hear *The Mosquitos' Parade*, especially being historically minded. *Whistling Rufus* is on the reverse, and Norman history has always interested me. Very good both sides. Henry Hall & Co. on DB1441 of the House of Columbia. There you are. Now buy it.

Mr. and Mrs. Billy Mayerl play lovingly together on one piano as husband and wife should do. *Marigold* one side, probably picked from the garden, and for the other, they have spoilt their pack of Bridge cards by isolating the *Ace of Spades*. You will find them—excellent, too—on DB1445.

"Streamline" Selections

DB1448 is another Columbia piano record this time by Vivian Ellis. He plays *Streamline*—the first waltz and after (or before) that a selection including *Kiss Me Dear*; *Other Peoples' Babies* and *You Turned Your Heart*.

Two H.M.V. ten-inchers for you. One side pleases me very much, *Neapolitan Nights*. The orchestra is quite good—the Salon Orchestra. (B2336).

You will have heard that clever Alec Templeton? He does a delightful piano medley (on B8221) in which you get *Temptation*, *Lazy Bones*, *Little Man You've Had a Busy Day*, *One Morning in May* and others. Very attractive.

Two Brunswicks, O1885 and O1858. The first is a Bing Crosby record—I *Love You Truly* and *Just a-wearyin' for You*. Very characteristic. Now, you Bing fans, don't say I didn't tell you of this.

I rather like Victor Young's Orchestra. He occupies both sides of the other Brunswick disc playing *Valse Bluette* and a waltz medley from *Faust*. The latter is very effective.

Two Deccas. If you like Brian Lawrance, the Baritone of Fred Hartley's Quintet—I do, very much—you can hear him sing *Carry me back to the lone prairie* and *The lights are low* on F5240. He does sing, and that's why I recommend him.

The other Decca is of good old Gus Elleg in 'Arf a pint of ale and the immortal classic *It's a great big shame*. I needn't say anything more about it. You should know what to expect.

Two Regal Zonophones—MR1431 and 1436. Ravels' *Bolero* arranged and potted for Joseph Muscant and the Troxy Broadcasting Orchestra and Gensier's *Speak Easy* on the reverse; the other being Fred and Harry (comedians) in a fairly good stunt called "When the Old Dun Cow caught fire" and *Dreams* on the reverse. They are quite good.

Bobby Brown and his Accordion Band play a valeta called *Tiddleywinks* on Winner 145

Criticisms by

WHITAKER-WILSON

My Broadcast-



"He's had no fan mail since he got writer's cramp!"

BEFORE my General News Bulletin I should like to thank the Western Brothers for a gag of theirs. It enabled me to dry up a London taxi-driver outside Broadcasting House. Men were busy erecting Belisha beacons, and I loitered in the highway admiring them.

An unpleasant-looking taxi-driver sounded his horn. Not to be honked at in such sanctuary, I held up my hand. He stopped, red in the face with anger.

I smiled sweetly and said: "Beacons to you!" and walked on into Broadcasting House.

He had no reply. Just went purple.

Thanks, Kenneth and George. It came in handy.

Sunday

LISTENED to lumps of *Cymbeline*. It's *Lone I* don't know as well as I ought. I don't know much more about it now because I only listened to the flow of English—all I wanted to hear. "Lovely stuff.

Cymbeline sounds as though she should have been a girl—a blonde. Norman Shelley made

**BUY A SUPPLEMENT OF
NEW DISCS FOR XMAS**

with the effective tango called *Moonlight Kisses* on the reverse.

There is also a good Panachord disc, with a pleasing number called *Ramblin' Red's Memphis*. Vocal with guitar and some astonishing yodelling (25643).

Jack Payne in *Shadows on the Pavement* and the popular *Isle of Capri* plays on Rex 8288. Very good.

The Isle of Capri is sung by Val Rosing on 8268 of the same firm, and *Shadows on the Pavement* are cast by Michael Regan on 8280. So you can take your choice. Rex also (8286) publishes a Sandy Powell record—the first that has come my way recently. *Sandy joins the Short Shirts* is the title and there are some amusing lines in it. Robert Naylor and Sylvia Cecil are good singers. Definitely so. You should get Imperial Broadcast 4002 and hear them sing.

Two Topping Numbers

I'll See You Again from "Bitter Sweet" and *I Give My Heart* from "The Dubarry." They are topping. A Polydor disc of the *Schlagobers*, the Whipped Cream Waltz by Richard Strauss is played by the Berlin Symphony on LY6098. Almost perfect. Ask to hear this.

Finally, H.M.V. in five 12-inch discs record Brahms' 4th Symphony. Very fine of course. DB2253-7 and worth the price.

Whitaker-Wilson.

-ing Diary

a he-man out of him. Which, of course, he was.

Later, to the symphony concert. Conductor, Casals.

What's that to me? I wanted to hear him play. I know he *likes* conducting, but I can't *hear* a conductor.

Have you noticed how many people say they have *heard* Sir Henry Wood conduct a Prom? I have never heard him make a sound, not even when eccentric Promsters have been rude to him from the floor of Queen's Hall. The only conductor I have ever *heard* was Sir Thomas Beecham when he told somebody to shut up at Covent Garden.

Casals, Casals,
Your greatest pals
Say: "Oh, my dear, dear fellow,
Why be so bucked.
They let you conduct,
Why *don't* you play your 'cello?'"

Monday

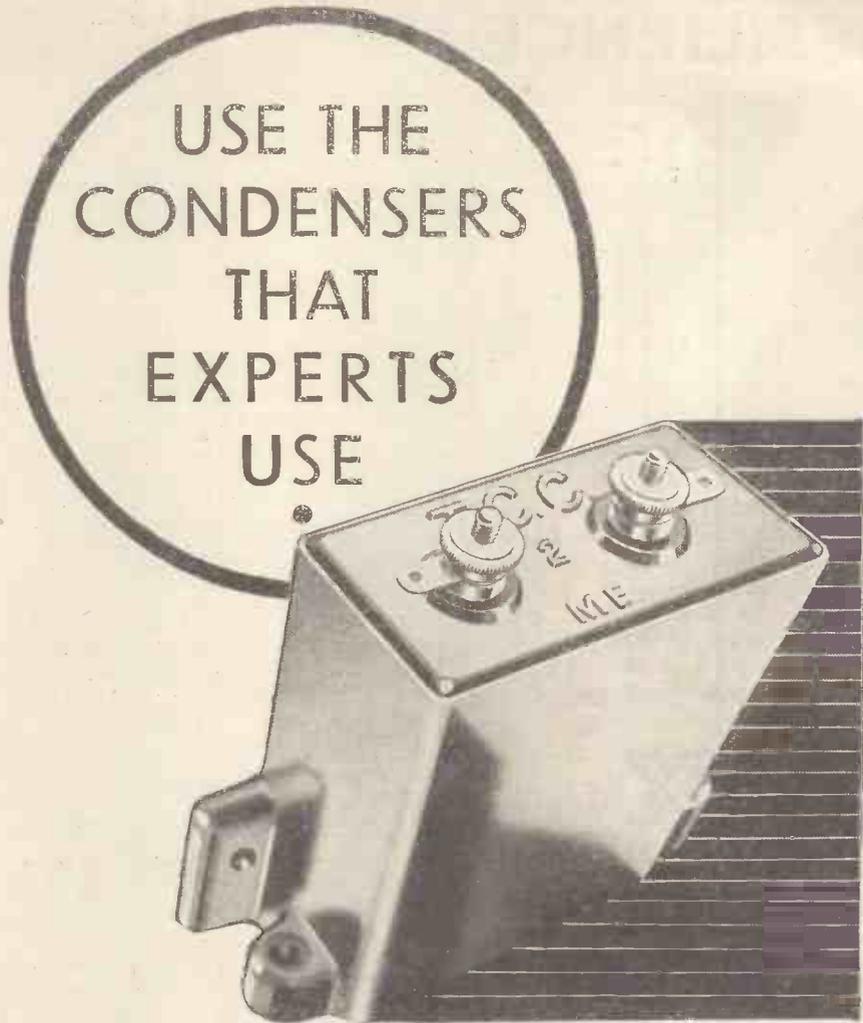
CHIMERA—too long for what it was. Which wasn't much. Gwendolen Evans and Philip Wade excellent in the parts, but I wearied before it was half over. I hoped Bill had got run over trying to cross the road in a safety lane, but he turned up again.

Fortunately, it finished ten minutes short of time. Not the best moment for the Drama Director to come to the microphone, but he was so clear and sensible in what he said about radio drama that I wished he had taken the forty minutes and left the play the ten.

Did you notice what he said about the next Famous Trial—that of poor Lady Lisle before Judge Jeffries? It will be given twice during the third week in February, but I have not heard which days yet.

All I can promise you is the *truth*. Believe me, you will learn something about British justice in 1685.

Continued on page 622



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My Broadcasting Diary Continued from page 621

Tuesday

CASUALLY glancing down the programme, a title caught my eye: "The Milky Way—a Great City of Stars." I thought this meant something about soft drinks in Hollywood, but a second glance told me it was Sir James Jeans on a few more million light years or something.

Of course, I enjoyed him; but what an awful thing it would be if someone put out one of the stars' lights! Sir James would have to wait 250,000 years before he could tell us about it.

Wednesday

THE SNOW MAIDEN came through well from the Wells, including some of the words. When we get an inkling of what an opera is about, things begin looking up.

Mr. Stanley ("Rolling Stone") Eke eked out an interesting living in France, but he oughtn't to try to be the ghost of A. J. Alan. People still write to the B.B.C. saying A. J. A. must be John Watt or Henry Hall, or someone. Now there will be thousands more letters saying he isn't E. K. E., but A. J. A.

Or, if they combine the initials, he might be an eastern potentate—the Eekaja of somewhere or other. Think all this out and you might get to know who A. J. Alan really is. Then, of course, you mightn't . . .

Thursday

I LIKE Fred Hartley's Quintet. Have said I so before. Why, though, is it a Novelty Quintet? I can't hear anything novel. Probably there are five people in it, but that's not novel.

Brian Lawrance sang splendidly, especially "The Low-backed Car," but I'm annoyed with Fred over that Chopin Waltz. He played the first part effectively. Why let the novelty fellers mess the middle part about?

Chopin once quarrelled with Liszt for doing much the same thing. I hope Fred Chopin haunts Fred Hartley and plays his "Song without a Name" on a "novelty quintet" of five hundred thousand trombones, all out of tune. Serve him right.

Friday

"FOLLOWING in Father's Footsteps" proved that one of the greatest misfortunes for a child is to have a brilliant father.

Saturday

ARTHUR CRANMER and the Wireless Males very daring to-night. Three songs about drink, one saying: "Ho, for a bottle from the bin!" I was shocked. Really Mr. Woodgate!

"In Town To-night" is best at its most topical. The account of the wedding cake for the Royal Wedding was really interesting. The sort of cake you couldn't have and eat!

Arthur Prince and Jim a bit under the weather, surely? Never heard them dull before. Putting Jim under examination not too successful. Better haul him up for some misdemeanour. We get more fun out of him.

Clarice Mayne not quite her old self. Just without that certain thing—her sparkle. Something very good for next time, Clarice, or I shan't love you any more.

Harry Hemsley just a genius. Never heard a baby of two weeks imitated like that before. Hint for John Sharman. You must cut out these sketches. The Tower thing was feeble. Nothing in it. Be hard on the scripts. Unless every line—every line, I said . . .

And the dear little Carlyle Cousins told me not to let my love go wrong. Beautiful singing. All right, Cousins. I won't.

Party Pranks With Your Radio



With a mike in one room and a loud-speaker in another, some amusement is got by the party trying to recognise familiar sounds heard via the reproducer

WITH the approach of the festive season, one starts to think of jolly parties, merry evenings, and all the good things associated with Christmas:

In the December issue of the **WIRELESS MAGAZINE**, which is the Christmas Number, there are some very useful radio hints and suggestions that will make your party a real success.

Also in this Christmas Number there is a feature entitled, "How to Start Radio for £4." This gives full constructional details of a set which can be built for £4 and includes cabinet, valves, batteries, and a moving-coil loud-speaker—an ideal set for the Christmas holidays.

Below are some of the other interesting features:—

- How to Start Experimenting.
- Is a Transportable Stenode Possible? What You Should Know About Short-wave Design.
- Reading Pick-up Response Curves.
- News About the Christmas Programmes.
- The B.B.C. Plans a New Regional Scheme.
- Wireless Jobs Made Easy for Mr. Everyman.
- Is There a Cure for Atmospheric? The Future of Television.

Get yours TO-DAY!

WIRELESS MAGAZINE

CHRISTMAS NUMBER

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Broadcast Wavelengths

This week we give details of the principal short-waves 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
13.93	21,340	Pittsburgh (W8XK)	United States
16.86	17,790	Daventry (GSG)	Great Britain
16.87	17,780	Bound Brook (W3XAL)	United States
16.88	17,770	Eindhoven (PH)	Holland
16.89	17,760	Zeesen (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 (WIXAL)	United States
19.68	15,243	Paris (Colonial) (FYA)	France
19.72	15,210	East Pittsburgh (W8XK)	United States
19.73	15,209	Zeesen (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
25.29	11,860	Daventry (GSE)	Great Britain
25.40	11,810	Rome (2RO)	Italy
25.45	11,790	Boston (WIXAL)	United States
25.51	11,760	Zeesen (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 (CRK)	Belgium
31.25	9,600	Madrid (EAC)	Spain
31.28	9,600	Lisbon (CTIAA)	Portugal
31.28	9,590	Philadelphia (W3XAU)	United States
31.28	9,590	Sydney (VK2ME)	New South Wales
31.297	9,585	Daventry (GSC)	Great Britain
31.35	9,570	Boston (WIXAZ)	United States
31.36	9,565	Bombay (VUB)	India
31.38	9,560	Zeesen (DJA)	Germany
31.45	9,540	Jeloy (LJLJ)	Norway
31.48	9,530	Schenectady (W2XAF)	United States
31.545	9,510	Daventry (GSB)	Great Britain
31.55	9,510	Caracas (YV3BC)	Venezuela
36.65	8,186	Rio de Janeiro (PRA3)	Brazil
37.33	8,035	Rabat (CNR)	Morocco
38.47	7,797	Radio Nations (H8P)	Switzerland
43.86	6,840	Budapest (HAT2)	Hungary
45.38	6,610	Moscow (RW72)	U.S.S.R.
46.53	6,447	Barranquilla (HJ1ABB)	Colombia
46.69	6,425	Bound Brook (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	Bound Brook (W3XAL)	United States
49.22	6,095	Bowmanville (VE9GW)	Canada
49.34	6,080	La Paz (CPS)	Bolivia
49.47	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	Skamlebak (OXY)	Denmark
49.59	6,050	Daventry (GSA)	Great Britain
49.67	6,040	Boston (WIXAL)	United States
49.83	6,020	Zeesen (DJC)	Germany
49.92	6,010	Havana (COC)	Cuba
49.96	6,005	Montreal (VE9DR)	Canada
50.0	6,000	Moscow (RNR)	U.S.S.R.
50.26	5,968	Vatican (HVJ)	Italy
50.42	5,950	Medellin (HJ4ABE)	Colombia

Long-wave Stations

Metres	Kilo-cycles	Station and Call sign	Country
1,107	271	Moscow (RCZ)	U.S.S.R.
1,144.2	262	Madona	Latvia
1,153.8	260	Oslo	Norway
1,209.6	248	Scheveningen Haven	Holland
1,224	245	Leningrad	U.S.S.R.
1,250	240	Vienna (Exp.)	Austria
1,261	238	Kalundborg	Denmark
1,293	232	Kharkov	U.S.S.R.
1,304	230	Radio Luxembourg	Grand Duchy
1,312.9	229	Ankara	Turkey
1,345	223	Warsaw	Poland
1,354	221	Motala	Sweden
1,395	215	Eiffel Tower (Paris)	France
1,442	208	Reykjavik	Iceland
1,442	208	Minsk	U.S.S.R.
1,500	200	Droitwich	Great Britain
1,571	191	Deutschlandsender	Germany
1,621	185	Istanbul	Turkey
1,648	182	Radio Paris	France
1,724	174	Moscow (I)	U.S.S.R.
1,807	166	Lahiti	Finland
1,875	160	Kootwijk (Huizen prog.)	Holland
1,886.7	159	Brasov	Roumania
1,935	155	Kaunas	Lithuania

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At making Radio Sets he was slick Every Set a success—

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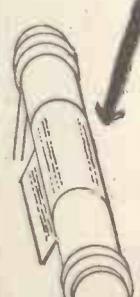
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\$40.00.—INVENTIONS PATENTED—United States— Samuel Goldstein, Registered Patent Attorney, 275 East Gunhill Road, N.Y.C.

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Please write concisely, giving essential particulars.

A fee of one shilling, postal order (not stamps), a stamped, addressed envelope and the coupon on this page must accompany all queries.

Not more than two questions should be sent at any time.

The designing of apparatus or receivers cannot be undertaken.

Slight modifications of a straightforward nature only can be made to blueprints. For more serious alterations the minimum charge is 2/6.

Blueprints supplied by us will be charged for in addition, but, of course, readers may send their own blueprints for alteration.

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We do not answer queries in cases where the fee is omitted.

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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.

Avomitor Tester

THIS handy universal tester is fully described in the illustrated folder to hand. It is capable of measuring milliamperes, volts, and ohms. Considering its size and price, you will be surprised at the variety of uses to which it can be put.

The Avomitor gives the accuracy and testing facilities hitherto only associated with more expensive and larger instruments.

It is a piece of apparatus which every constructor will find invaluable. **222**

Formo Products

THE new three-fold leaflet from Formo Products, Ltd., describes the main components which will have a wide appeal to constructors. The Formo Sensity iron-cored coils, which are available in three types, represent a distinct advance in coil design. The Formo screened paper condensers are of unique design. They are cylindrical in shape and can be fitted to the baseboard in a vertical position by means of a projecting threaded bolt.

They have a working voltage of 375 volts D.C. and are finished in a dreadnought grey, with all fittings nickel plated. Other lines are described. **223**

Voigt Loud-speaker

FULL details of the Voigt loud-speakers are embodied in the illustrated folder now available. These speakers can be used in conjunction with the special metal or wooden horns which form a feature of the design. The specifications cover most useful technical details while curves showing the response, over a frequency range of 64 to 16,000 cycles, enable one to obtain a visual indication of the wonderful quality obtainable.

To those interested in public address work, the leaflet will be of exceptional interest. **224**

T.C.C. Suppressors

A SPECIAL leaflet has been issued by the Telegraph Condenser Company, dealing with their units for interference suppression. Two types are available, the prices being 10s. 6d., and 18s. 6d.

No. 1 unit will be found perfectly satisfactory in the majority of cases, but in a few instances where the interference is especially severe, the No. 2 unit may be found to give improved results.

Circuit diagrams are given, together with useful information regarding the various forms of interference usually experienced. **225**

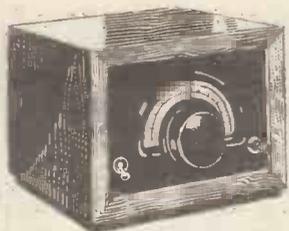
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W.346



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