

BRITAIN'S LEADING RADIO JOURNAL

Popular Wireless

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AND TELEVISION TIMES

EVERY WEDNESDAY
PRICE 3^d

HOW TO MAKE
A ONE-VALVE
AMPLIFIER
★ ★
WE'VE SEEN
TWELVE RADIO
CHRISTMASSES
★ ★
"EMPIRE
EXCHANGE"

Special

XMAS WEEK NUMBER





Auntie forgets her operation



Uncle soon miss his club than his game



Mabel never will be left out



Father always wants to join in



Grandma feels quite young again



Jack says it's a spree

Are You playing GRANDFATHERS WHISKERS Everyone Else Is!



Grandpa forgets his gout.

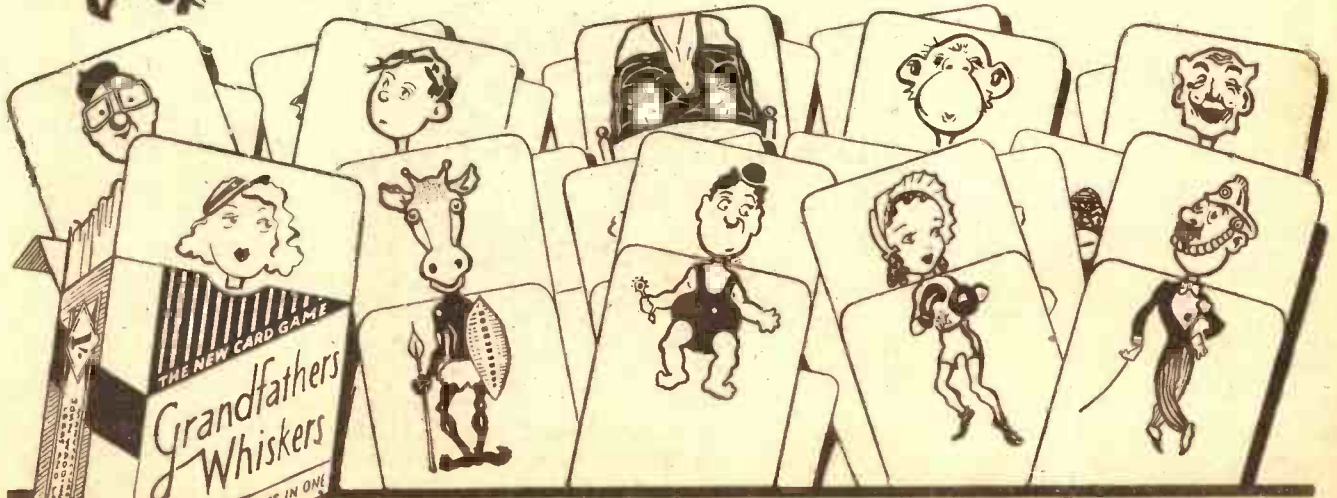
THE more you search for Grandfather's Whiskers, the more you will enjoy yourself. It's the most amusing and intriguing game ever devised, and one that will afford every member of the family a merry evening's entertainment. Any number of players can take part—no difficult rules to remember—just one big spell of excitement and laughter.

The pack comprises 48 cards, with brightly coloured pictures on the front which can be made into more than 1,000 uproariously funny figures. The backs of the cards form a series of six Jig Type Puzzles—simple ones for the children and more perplexing ones for grown-ups.

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Made by John Waddington Ltd., makers of the world's finest Playing Cards.



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Grandfathers Whiskers
3 IN ONE

On Sale at all Newsagents, Stationers, Booksellers, etc.

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POPULAR WIRELESS AND TELEVISION TIMES

MANAGING EDITOR: N.F. EDWARDS.

TECHNICAL EDITOR: G.V. DOWDING ASSOC. I.F.E.

**YOUR HEALTH!
WELCOME FOG
SOME SPEAKER!
THE DIE-HARDS**

RADIO NOTES & NEWS

**THE SIXTH PIP
PUBLICITY
HAPPY DAYS!
RADIO GREETINGS**

Happy Christmas!

I REMEMBER, I remember . . . the first Christmas Day I spent away from home. Years and years ago, alas!

Having no friends with whom to merry-make, I went up into my hired back bedroom, filled a glass, raised it to nobody in particular and said to the four walls and a creaky bed: "*Jolly old pals, here's luck! Happy Christmas!*"

They didn't say a word, of course; but somehow I felt all the better for it!

This year, some time on Christmas Day, I'm going up to my room to charge my glass again, and in similar fashion I shall drink *your* health. (Yes, sir, and yours—and *yours*.)

To all the good "P.W." chaps I don't actually know, but know I should like to know, I shall quaff a drop of the best, wishing you prosperity—or, failing that, a stout heart in adversity, which is no less to be desired, believe me.

And of all the hundreds of thousands of words I've penned for you there have never been two more sincere than the following: **Happy Christmas!**

Full Moon and Fog.

HERE'S a tip for the long-distance lads from another of those U.S.A.-owners! F. E. M., of Kilburn, is the gent. in question, and he says: "The period of the full moon seems best for transatlantic reception, but when this period is accompanied by foggy weather conditions are ideal."

F. E. M. surely ought to know, for he has definitely identified sixty different transatlantics in the last couple of years! His best (*verified by mail, mark you!*) have been Reno KOH and Buenos Aires LR5.

The set which F. E. M. uses is a four-valver (2 S.G., det. and super-power), and the pen he uses is dipped in honey: for he not only hands out a bouquet to "P.W.," but he also presents your Ariel with a very handsome compliment all to himself. Undeserved, I fear, but uncommonly cheering all the same!

Lincolnshire's Latest.

THOSE amazing old chaps who do nothing but brood on the weather ("*D'you remember that remarkable hard winter in 'ninety-*

one, Jarge?") will shake their heads over the Air Ministry's latest. It is a national meteorological and aviation station, the programmes from which will consist of weather reports, weather forecasts, weather warnings and weather news, whether it's hot or whether it's cold.

The station is to be erected at Cranwell, Lincs, by Marconi's, and will probably be dissecting depressions and disseminating the details by early summer, 1935.

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He Was First.

THE world's first announcer—who was saying "Good-night, everybody," long before broadcasting as we know it had begun!—has just retired with a worn-out voice. He is the popular Mr. Scherz, for long senior announcer of Budapest and now acting as their librarian.

Before the war the Hungarians had a telephone news service worked from a

central office, and Mr. Scherz used to be in charge of the programmes and do all the announcing, so that was why he was all ready for radio when it came along.

Let's salute him: Good luck, sir! "P.W." readers know you well and wish you well.

The "Unchanging" East.

THERE have been some rapid radio developments in the Far East of late, and at least one new super-power station has taken the air.

This is at Hsinking, where a 100-kilowatt now lords it over the Manchukuo capital and causes the local peasants to wonder what next is coming.

Tokyo, where broadcasting has captured public favour, is now to tackle television. Regular programmes for the eye are to be radiated early in the New Year.

The Big Noise.

THE American engineer who has been working on a louder-still loudspeaker is feeling very satisfied with his progress.

He has deliberately turned his back on true fidelity and concentrated on emphasising the commoner speech frequencies.

He now calculates that there is an amplification of about one million, and the power developed by the diaphragm is approximately equal to a 40-lb. hammer blow. Useful for addressing troops, crowds, firemen at work or mother-in-law!

The Talkative Bulldog.

STUDENTS of the bizarre in broadcasting will mourn the death of "Princess Jacqueline," who could say only twenty words, but had secured several broadcasting engagements on the strength of them!

For "Princess Jacqueline" was a bulldog who, in addition to the ordinary canine vocal chords, had others, enabling her to imitate human speech.

She used to say "Hello" to the microphone quite distinctly, and sign off with a very creditable "Good-evening."

Many scientists were interested in the "Princess," and it was one of them—Dr. Knight Dunlop, of Johns Hopkins University—who examined her to discover the secret of her unusual vocal gift.

(Continued on next page.)



His Majesty the King, who will broadcast a message to the Empire from Sandringham to-morrow (Christmas Day) at 3 p.m. The King's message will be preceded by a special programme entitled "Empire Exchange," the latest details of which are given on page 562.

BROADCASTS THAT WERE NOT MEANT TO BE HEARD

Crystal Purity.

THE other day I met a conservative party who assured me that wireless in his neighbourhood was only just overcoming the prejudice against anything new-fangled. (No, I shan't tell you his county. But it was within 100 miles of London.)



And now I see a letter in "The Northern Whig," Belfast, in which the writer says: "I cling to the old-fashioned crystal set because I prefer good reception, especially of music; and it is past my understanding how some of my friends, calling themselves musical, can tolerate the hideous cacophony emanating from some valve sets." How these old ideas linger, to be sure! All wrong, but immortal, apparently.

Polar Radio.

YOU will have read about the special broadcast from London of a Christmas greeting to a party of explorers in Greenland. And you may have wondered what reception conditions are like in the lofty latitudes above the Arctic Circle.

I once asked a chap I knew, who was wireless man on a Hudson Bay steamer. And he said that listening up there spoiled you for any other kind of reception.

No local station, no interference and no hint or suggestion of atmospherics—so that even the weakest programmes could be heard clearly. And, according to him, the whole world's programmes seem to be attracted by the Pole, and any old aerial in its vicinity was simply alive with stations.

Which Pip?

FOR most of us the six pips of Greenwich are adequate time-tellers, and when we hear them and glance at our watches' second hand we are satisfied. Not so F. F. S., who writes from Stockton.

F. F. S. must be engaged on some kind of scientific work, I assume, for he wants to know whether the pips start at eleven or stop at eleven, or what.

Well, that's easily answered. The first pip is just a warning toot; the second is a reminder that time is fleeting; and the third is in the nature of a solemn warning that No. 4 pip is coming.

The fourth pip means "Get Ready, Boys"; the fifth implies "Steady there, steady"—and then, the stage being set, the audience alert, the curtain up, along comes the Old Man himself, The Right Honourable Sixth Pip of Greenwich.

You can ignore the others, but when he bangs your ear-drum that's "Time, Gentlemen, Time!"

In the Courts.

THE lengths to which your keen advertising man will go are well illustrated by a citizen of Omaha. His job was to advertise a certain film. He did.

Knowing that the local broadcasting station would put police-court proceedings on the air at a stated time, he got himself arrested for speeding.

In due course, before the listening microphone, the judge asked him why he was speeding at umpteen miles per hour, to the danger of the public.

This was our chappy's cue, of course, and he stated impressively that he was going to see such and such a film and simply couldn't bear to miss one flick of it!

He got a night in a cell, but the film got a free mention over the air!

Not Meant for Mike.

HOW one little touch of human nature can brighten up the most pompous programme! We all love those unexpected asides, not meant for the microphone, which occasionally slip past all precautions and formalities. Did you hear that one at the Guildhall banquet not long ago?

While waiting for the speech Mike gave us some comfortable, unselfconscious conversation, from unsuspecting diners; and then, clear as a bell, came the clarion call: "Waiter, I'll have another double brandy!"

Too True!

YOU know the queer pronunciation of the names of popular tunes which is sometimes heard from foreign stations who play English gramophone records.



The other day a gentleman who had been anticipating the festive season got home in a slightly elevated mood; and so that his wife should not notice his too-hilarious condition he switched on to the wavelength of a favourite foreigner for English dance music.

Imagine his surprise when a lady's voice said, in what seemed a reproving tone: "Leetle man, you've had a boozy day!"

The Biggest Brick.

SOME time ago I raised the question of what was the worst faux pas ever broadcast. And at the back of my mind was a memory of a snorter—happened in the very early days, when audiences to radio were small and matey and when the station's shut-down switch was mounted on the microphone stand.

'Tis said that an announcer, in his politest tones, wished the public "Good-night," and then, forgetting to pull the switch out as usual, he added an awfully impolite extra, which was always spoken at the end of the day, but never, never, NEVER meant to go on the air!

The audience didn't let on about it—probably they thought they couldn't possibly have heard aught!

Surprise for Yorkshire.

WHAT reminded me of broadcast bricks was a cheery letter all the way from Sydney, New South Wales. The writer is Don B. Knock, Radio Editor

of "The Bulletin," who was once a leading light of the old Leeds-Bradford station. And he recalled that legendary "Good-night" mentioned above when recounting the following true experience of his own, which happened when he was control engineer on duty.

"It was a murky Leeds afternoon. All was in readiness and the speaker waiting when the lighting-circuit main fuse blew.

"Through the control window I could see, in the light of the LS 5's of the line amplifier, a pair of horn rims goggling in the studio. Before I could awaken to what was happening the speaker burst in with: "WHAT THE ?? **!!! zzz . . .," etc.

Old ladies jumped and dropped their knitting, and astonished Yorkshiremen caught their breath and hoped for more! But nobody got into a row for it. Happy days!

Getting America.

WRITING to notify me that he had succeeded in picking up broadcasts on the medium waves from two Buenos Aires stations, LR 4 and LR 3, a valued correspondent gives a couple of hints about getting America after midnight.

Hint 1: Watch out for the announcement of a station's name just before the quarter-hour comes round. (They used to announce exactly at 15, 30, 45 minutes past, etc., but now it's often just a little in advance.)

Hint 2: Don't ignore very powerful programmes in order to get weak ones—sometimes the powerful ones prove to be from little, low-powered and very distant stations!

Incidentally, judging from correspondence, American transmissions are coming over well at the present time.

Deep Calling Unto Deep.

WHEN certain Chatham chaps got together in the Medway Amateur Transmitters' Society recently for a long-distance radio contest they set a ball

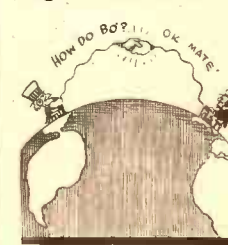
rolling which I sincerely hope will never stop. Sort of snowball of the ether!

What they did was to call up the other Chatham, over in Massachusetts, and swap greetings between our Kentish town and its namesake in the New World!

Now, as every Man of Kent knows, adjoining Chatham is Rochester—and Rochester was not going to be eclipsed by Chatham like that. So a Rochester amateur gets up and bangs his transmitting key about to such purpose that presently a still, small voice from Rochester, New York State, says: "Hullo, brother!" And more greetings from namesake towns were hurled across the world!

I should like to hear of other instances similar to these.

ARIEL.



How to Make A ONE VALVE AMPLIFIER

The compact unit described hereunder has been designed to enable owners of practically any types of battery sets to increase the output power in the easiest possible manner.

Designed by the "P.W." RESEARCH DEPARTMENT.

THIS handy little unit can be added to any set in order to build up greater volume. It is especially suitable for adding to the one-valve receiver which we described last week. Coupled to this, you have a first-class two-valve receiver in convenient unit form, each of the units being capable of independent action.

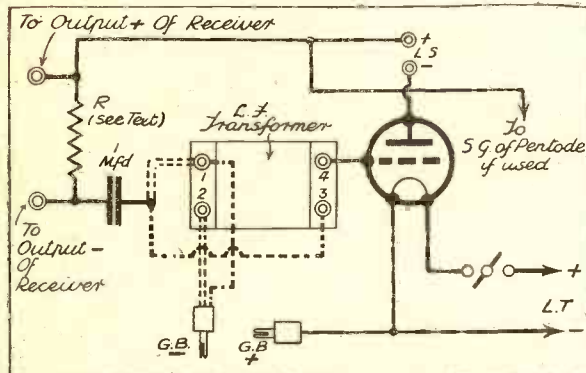
Also it is possible to employ a pentode, if desired.

L.F. amplification is a straightforward operation, free from most of the troubles which are to be encountered on the high frequencies. There are no new tuning circuits and their controls to be added. There merely has to be the valve and one form or another of low-frequency coupling link to join the output circuit of the set to the input of the new L.F. amplifying valve.

case, are to improve the quality—i.e. to get the purity of resistance-capacity coupling plus the greater volume of transformer coupling and to make it easy to couple the amplifier to different kinds of sets.

Incidentally, there is no possibility of the H.T. current breaking down the primary winding of the transformer. We purposely avoid the use of the term "burning out," because it is not usually the actual fusing of wire that causes transformer breakdowns. What more often happens is that an electrolytic action causes the breakage.

THE CIRCUIT EMPLOYED



The dotted lines show alternative connections for 1 : 6 or 1 : 2 ratio transformer coupling as explained in the text.

For instance, the L.F. amplifier could be detached and employed in conjunction with a one-valve short-wave receiver at any time to give loudspeaker results on the short waves. And as easily it could be again joined to the original one-valve set for normal broadcast reception on the medium and long waves.

The unit system is, therefore, an economical method of working, for it permits of

The L.F. impulses pass through the 1-mfd. coupling condenser, which, by the way, is a barrier against the H.T. current. In this way L.F. impulses only pass through the primary winding of the L.F. transformer, and are communicated to the grid of the valve of the amplifier through the secondary winding of the L.F. transformer.

Voltage Step-up.

However, it should be noted that the voltage of these impulses is stepped up by the transformer, with a consequent increase in the amplification given to them by the valve.

You cannot get this voltage step-up with resistance-capacity L.F. coupling; it is possible only with some kind of transformer.

The main reasons for shunting away the H.T. current by means of the resistance and condenser used with the transformer, as in the present

Quality Considerations.

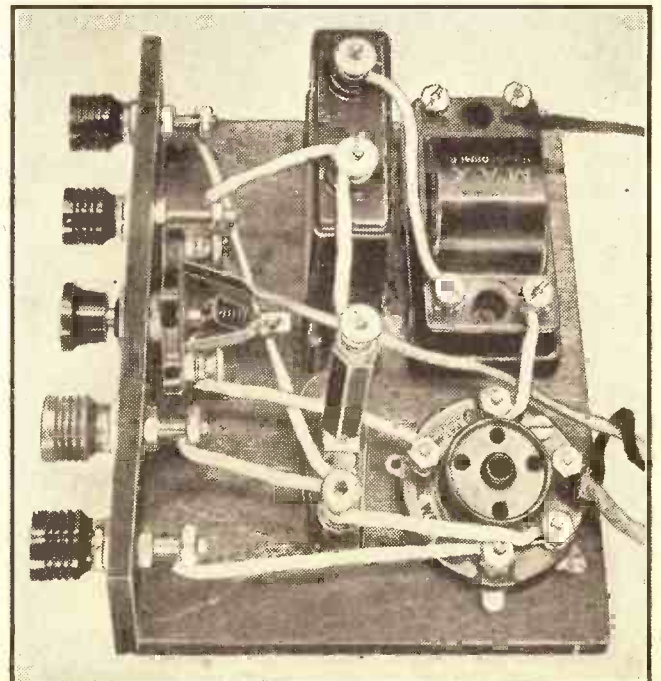
The better quality that is frequently to be obtained with parallel-feed coupling is also due to the removal of the H.T. current from the primary of the transformer.

The most important reason for this is that the magnetising effects of the current on the core of the transformer are absent.

It will be observed from the accompanying list that very few components are needed for the amplifier, and the photos clearly indicate the simplicity of its construction. The whole thing is built on to a simple baseboard of five-ply and a small ebonite panel. If desired, a covering case of three-ply or other suitable wood can, of

(Continued on next page.)

VERY QUICKLY CONSTRUCTED



Very few leads have to be connected in the construction of this amplifier, which is wired for either a triode or five-pin pentode valve.

- COMPONENTS REQUIRED**
- 1 Graham Farish "Max." L.F. transformer.
 - 1 T.C.C. 1-mfd. fixed condenser, type 50.
 - 1 Graham Farish "Ohmite" resistance (for value see text).
 - 1 Graham Farish vertical resistance holder.
 - 1 W.B. 5-pin valve holder.
 - 1 Bulgin 2-pt. push-pull on/off switch, type S.15.
 - 4 Clix indicating terminals.
 - 1 Baseboard, 5 in. x 4 in.
 - 1 Peto-Scott terminal strip, 5 in. x 2 in.
 - 1 Coil B.R.G. "Quikon" connecting wire.
 - Screws, flex, etc.

the L.F. stage being applied to different purposes without any structural alterations to it.

But because this amplifier is particularly suitable for teaming up with the one-valver of our last issue, it must not be thought that it is necessarily restricted to such applications.

It could quite well be coupled to a set already having a stage of low-frequency amplification, as it is possible to use a large power valve in it.

How To Make A ONE-VALVE AMPLIFIER

(Continued from previous page.)

course, be constructed. Or more ambitious constructors might like to try their hands at a metal case, using tinned steel or aluminium.

There is not much which need be said about the assembly, for the details of it are clearly to be seen in the photos and

The value of the coupling resistance marked R will depend upon the last valve in the set with which the amplifier is used.

If it is a detector valve, such as would be the case if you were connecting it to a one-valve set, then 60,000 ohms will be the desirable value. If the set already has one L.F. valve, then 30,000 ohms will suffice.

Should this existing

SOME SUGGESTED VALVES

	Small Power	Super Power	Small Pentode	Super Pentode
Cossor ..	220P.A.	230X.P.	220H.P.T.	220P.T.
Hivac ..	P.220	P.P.220	Y.220	Z.220
Marconi ..	LP.2	P.2	P.T.2	—
Mazda ..	P.220	P.220A.	Pen.220	Pen.220A.
Mullard ..	P.M.2A.	P.M.202	P.M.22A.	P.M.22
Osram ..	LP.2	P.2	P.T.2	—
"362" ..	LP.2	P.2	M.E.2	—
Tungsram ..	LP.220	S.P.220	—	—

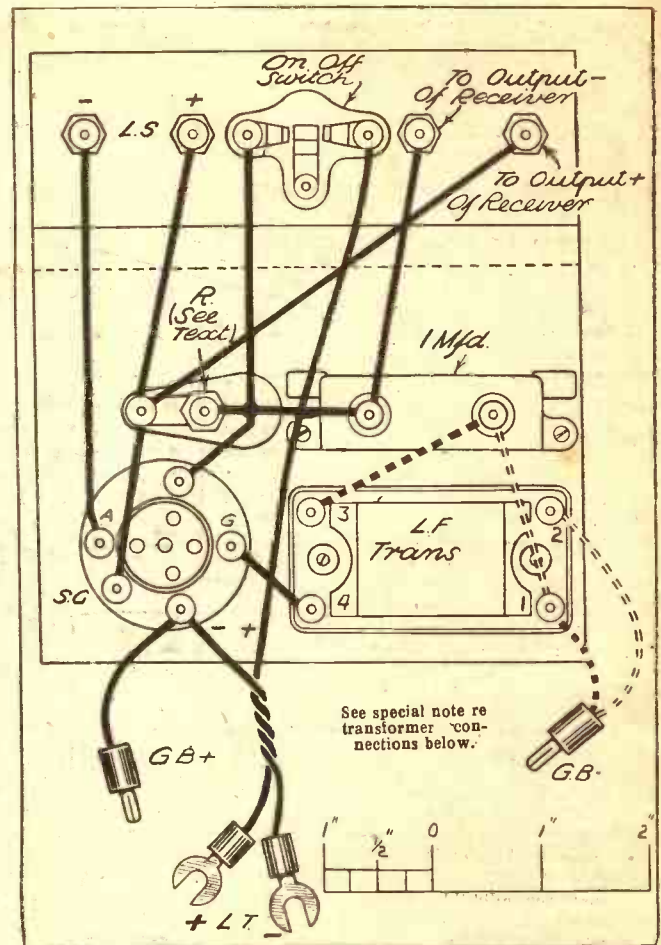
BATTERIES.

The H.T. and L.T. batteries already in use with the set should be employed for the amplifying unit. This also applies to the G.B. battery, unless the set is a single-valver, in which case a separate G.B. battery will be needed for the amplifier.

wiring diagram. And you do not have to be precise in your layout to an eighth of an inch. But be careful with the wiring, especially if you are going to employ one of the larger power valves with its comparatively high H.T.

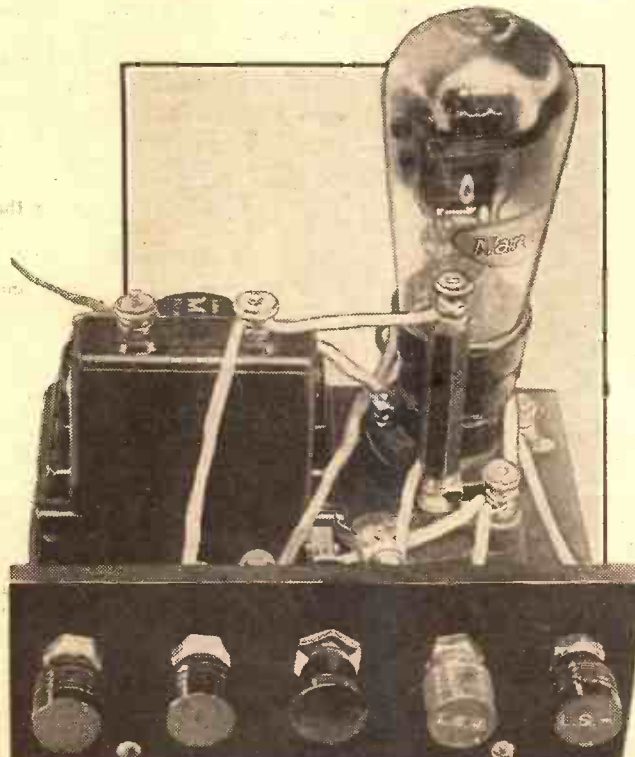
When the unit is wired up exactly in accordance with our diagram, either a pentode or an ordinary valve can be used in it without altering any of the connections.

stage of L.F. amplification in the set employ a power valve, or pentode, as will almost certainly be the case, then this valve must be exchanged for an ordinary L.F. type of valve. The power valve or pentode can



The shunt-fed transformer ensures a particularly straight amplification curve, giving great purity of reproduction.

CHOICE OF OUTPUT VALVE



A wide range of valves can be used in the amplifier, as will be seen from the list given on this page. The LP.2 shown in the photograph is a typical example of the "small" power type of output triode.

be used in the amplifier if it is large enough to handle the volume which will be built up.

Sometimes a set has an output transformer or choke-condenser output arrangement in it. In such a case it will be necessary to join the input terminals of the amplifier direct to the wires which go to the primary of the transformer or output choke after having disconnected them from the terminals of whichever of these two components is used.

The Batteries.

The output of the amplifier is "straight," for the simple reason that most loudspeakers these days have coupling transformers fitted to them.

Separate grid-bias and L.T. batteries are not needed for the amplifier. You connect the respective leads to the batteries already being used for the set, although a larger grid bias might, of course, be necessary to accommodate the power

valve used in the amplifier—the existing one might not be of sufficiently high voltage.

If the existing set is a one-valver it will not, of course, already have a grid-bias battery.

The exact grid bias needed will depend upon the type of valve you get for the amplifier, and the same applies to the H.T., although the maximum of a 120-volt H.T. battery will serve for the majority of power valves that are likely to be used.

Transformer Connections.

The wiring diagram shows dotted connections to the L.F. transformer, and the purposes of these are so usefully important that the matter must be dealt with separately so that no constructor will overlook it.

One of the great advantages of using a parallel-fed transformer is that its ratio can be varied to suit different needs.

With the particular one we employ in this amplifier a number of ratios are available, but we have selected two which will cover most requirements.

When two leads are joined in accordance with the hollow dotted lines, a 1 to 6 ratio is obtained. You will generally want this when the amplifier follows a detector valve.

When the two leads are wired in accordance with the full dotted lines, there will be a 1 to 2 ratio giving the less amplification; that is generally quite as much as will be wanted when the amplifier is used with a set which already possesses a stage of L.F. amplification.

Constructors' Successes with S.T.600

The amazing performance given by the S.T.600 has brought in letters of praise from enthusiastic constructors in all parts of the country.

"A GREAT SET."

Dear Sir,—Allow me to thank you for a great set.

Programmes which we knew were being broadcast but could never receive have become like our locals, thus vastly increasing the pleasure of listening-in.

I have already "spotted on" 63 stations, and am delighted with the great possibilities of this splendid set.

The Extractor certainly is the goods, and no mistake. My log is with an inside aerial 30 ft. long.

There is one thing I should have liked to have seen incorporated, that is Q.A.V.C. No doubt you have your reason for not incorporating the above. I am working my set from a D.C. eliminator.

Again thanking you for such a splendid set.

SAMUEL NICOLSON, 131, Ardgowan Street, Glasgow, C.5.

"EXTREMELY SENSITIVE—IMMENSE VOLUME."

Dear Sir,—After building the ST. 300, 400, 500 and 600, I would like to say that the latter is worth more than all the others together.

I have never handled or heard such a receiver as this one, not only extremely sensitive with immense volume, but handsome to look at.

In the bottom compartment is the Rola moving-coil speaker, fitted inside a Howe box baffle, which, as you know, does away with box resonance. The volume control is a luxury to this wonderful set, as it enables one to go from bottom to top of dial without any noises between stations.

You may, if you wish, use any part of this letter.

FRANK GARRATT, 79, Colwick Road, Nottingham.

"DOES ALL YOU CLAIM."

Dear Sir,—Having made up the S.T.600 and had it working for a fortnight, I must convey my sincere appreciation to you and all that helped to make possible one of the best sets I have ever made.

I find it does all that you claim for it. The selectivity and volume, also ease of tuning and tone, are amazing. The performance of the Extractor was quite a surprise, and so easy. It is even better than I thought it would be. It wiped out West Regional as though it did not exist, and I was able to receive stations on both sides at full loud-speaker strength without interference. The same applies to the long waves. The Extractor will reduce the spread of Droitwich down to about 2 degrees, and I am able to receive any station on this band quite clearly.

The "Spot-on" dial is a wonderful improvement to radio and will be welcomed by every maker of the set. There is no limit to

the stations you can receive on this set on a moderate aerial, and quite a good number without aerial or earth. Although I live in the heart of the Welsh hills I have received a number of the American stations at good strength.

The trouble is that it is not my set! I have built it for a friend, so you can guess my feelings now that I am using my own set again! In conclusion, please accept my sincere wishes for the success of one of your best achievements.

M. MACKAY, 6, Clifton Street, Cwmpark, Treorchy, Glam.

"AMAZED AT ITS PERFORMANCE."

Dear Sir,—I feel I must write to you and congratulate you upon your success in producing such a fine set as your S.T.600. I built the S.T.600, and from the first switching on I was amazed at its performance.

At first, however, I was not getting all I should out of it, as I had happened upon a faulty volume control. The makers of this have replaced it for me and now I have the set going beautifully. At mid-day to-day I switched around and pulled in a large number of stations, many of which I have never heard in daylight before.

Yesterday a friend who owns an S.T.500 saw my S.T.600 and he was amazed at the ease with which I could tune in station after station at full L.S. strength in daylight. I would be delighted if you could call on me, as I should like to see you handle the set; I believe it would be a revelation. I have handled many sets, but I would rather have my S.T.600 than any of them. The quality on a W.B. Stentorian is all that can be desired. The volume is ample on practically all the stations which are worth hearing. At one switching around I logged 57 stations, all at good L.S. strength, and now I can handle it better I could easily add many more.

The Extractor circuit I have short-circuited, because here we are about 15 miles from Plymouth and nearly 200 from Droitwich, so I do not need it at present; but I have tried it sufficiently to know that it will cut out these stations as you claim for it. Again in closing, many thanks for such a fine set and wishing you every success.

ERIC PENGELLY, Fernleigh, Calstock, Cornwall.

—Some of them have already been published, and this week we are giving a further batch from successful builders of this magnificent receiver.

"BETTER THAN ANY PREVIOUS SET."

Dear Sir,—Staggering, incredible, it cannot be true, and yet the S.T.600 is better than any previous set. Gee, you've sure dished up the goods!

Sorry—it's 1.30 a.m. and I'm listening to the N.B.C. of America; and here I have a grievance: I want a new "Spot-on" dial specially for

American stations.

I built your set as specified, but being very fond of records didn't like the volume from super-power, so I built, on a separate board, the S.T.500 Class B section, and lo, I get my 1½ watts with perfect purity and kick at ¼ battery cost! If anyone wants to hear this set for Class B, he may call at my address at any time.

I consider myself very critical on modern sets: here is my list since 1932:

1932 (1) S.T.300. 1933 (2) S.T.400. (3) Took out last two valves and used S.G. det. and two pentodes, Q.P.P. (4) Built your Q.P.P.5. (5) Took out Q.P.P. for Class B. (6) Built S.T.500. 1934 (7) Built S.T.600 and Class B amplifier.

G. S. GRANGE, 3, Wilson Road, Coseley, Staffs.

A BRISTOL CONSTRUCTOR'S ENTHUSIASM.

Dear Sir,—Allow me a word in praise of the S.T.600. Truly amazing results!

For weeks I had waited anxiously for the next S.T. set. At last it was out, and then impatient hours waiting until the kit arrived. Ah, it has arrived, and I hurriedly unpack and check components. Good, all here and correct. I carefully build, and when completed I pause to admire a handsome panel complete with "Spot-on" dial!

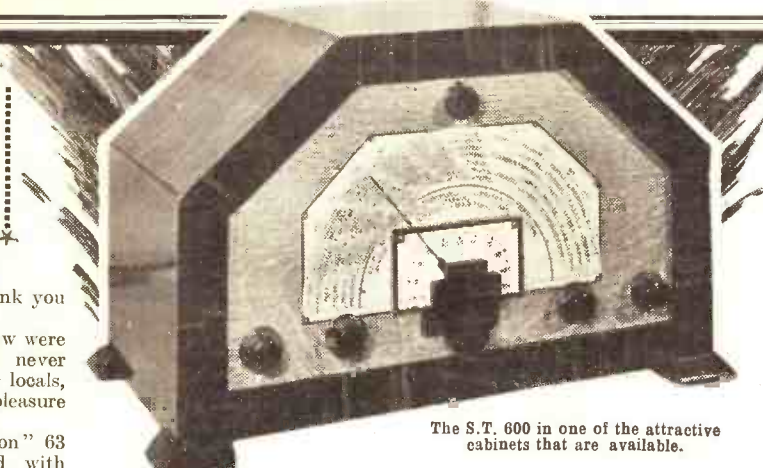
The dial intrigues me, so I connect up the batteries. First West Regional, then down to Fécamp. Good, got it. Now the trimmers. Great Scot! I've made a mistake. No, it is Fécamp. Whew! What volume! Now, round the dial. Amazing! Stations galore. Local stations completely subdued with Extractor. I change to long wave and duly extract Droitwich. Easy to get stations on long wave with truly remarkable volume.

Now a word to some of my fellow radior enthusiasts. Please do not pollute the air on Sunday mornings trying to get Fécamp and Luxembourg; buy an S.T.600 and get these stations with ease.

I believe all S.T.600 constructors will agree with me when I say that no praise is too great for the S.T.600.

E. J. BASS, 23, Ramsey Road, Horfield, Bristol, 7.

(Continued on page 576.)



The S.T. 600 in one of the attractive cabinets that are available.

“EMPIRE EXCHANGE”

Further details about the historic Christmas Day programme which commences at 1.55 p.m., during which greetings throughout the British Empire will be exchanged.

THE B.B.C. is striving tooth and nail to make this Christmas a memorable one, and is putting forth tremendous efforts to ensure that to-morrow's (Christmas Day) afternoon programme, of which we told you two weeks ago, surpasses by far anything yet done.

Since we published the article called "Royal Radio" in our December 15th issue we have received news of extensions to the giant broadcast. Not only will all those relays and greetings, of which you were told, be carried out, but other messages and

relays will be included when "Empire Exchange" goes on the air at two o'clock.

Aran Islanders, whose storm-swept home was made so famous by the film "Man of Aran," are to speak in a relay from the Irish Free State. Scotland is to send her greetings from Glasgow, and additional link-ups with South Africa and Australia have been arranged.

Relays From Distant Parts.

One of these is from an historic farm at Alphen, Constantia, a fertile vine-growing district in Cape Province. Another includes messages from an attendant in the Botanical Gardens, Melbourne (where, of course, it will be mid-summer), and a third provides us with contact with a life-saver at Bondi, one of the famous Sydney beaches, where bathing will be in full swing.

A further voice from Australia will be that of a fisherman in Hobart, Tasmania, who will send greetings and news to the Motherland.

The last item before the King's Message will be a relay from a Warwickshire village, depicting Christmas in the English countryside. This, of course, will be of striking interest to our friends on the other side of the world, where they are as interested in the way in which we spend the festival season as we are to learn that they have their Christmas turkey and pudding in the heat of the summer.

A Real Yuletide Flavour.

Carols and glees will be sung and everything possible will be done to give this last item a real Yuletide flavour.

As already announced, the programme of "Empire Exchange" begins with a sound circle of bells of the British Commonwealth, and an attempt will be made to conclude with the singing and playing of the National Anthem in a similar way.

The Anthem will begin quietly with a few singers in the Warwickshire village, to be taken up in South Africa, Australia and Canada, concluding with a choir, military band and organ performing the last verse in the concert hall of Broadcasting House.

Rehearsals throughout the Empire are going on as I write, the tests being carried out day by day in groups of countries. We may confidently look forward to a really thrilling programme to-morrow—one that no listener should miss.

Especially may we expect the declamation by 8,000 natives of the Xosa tribe of South Africa to be impressive. They will be headed by their chief Mdingi, and their ode of greeting to H.M. the King from their native compound will be one of the most outstanding "O.B.'s" the B.B.C. has attempted.

Stimulating Sounds and Descriptions.

Would that we had perfected television to enable us to see as well as hear all the speakers who are to take part in to-morrow's broadcast. To be able to flit by a beam of light from Ottawa to Melbourne, from the Khyber Pass to the Mersey Tunnel, or from Bombay to Vancouver would indeed be exhilarating.

That time is not yet come, though there is promise of it in the future—near or distant. But we shall have plenty of food for our imagination in the stimulating sounds and descriptions that are to be given us during that romantic period following 1.55 p.m. on Christmas Day. **K. D. R.**



ALL THE EMPIRE will listen to the giant radio link-up between Great Britain and her Dominions and Colonies. Here are some of the places and people who will receive and send greetings on Christmas Day.



The bells of the Church of the Nativity at Bethlehem are to be heard. Above is a view of Bethlehem taken from the belfry.

Below it can be seen the Parliament Buildings at Ottawa. Canada is taking a big part in the Christmas afternoon Empire broadcast.

Chelsea pensioners and South African natives are included among those who will be heard sending greetings during "Empire Exchange." Even the lone outposts of the North-West of India (left) have not been omitted.

Valve connections at a glance

BY
A.S. Clark

FOUR pins, **FIVE** pins, **SEVEN** pins, **NINE** pins! Where will it stop? Goodness only knows! But don't let's worry about that now. The object of the present article is to give you some idea of the connections for existing valves.

And, surprising though it may seem, there is quite an amount of rhyme and reason in the arrangement of the connections for the various valves. But before

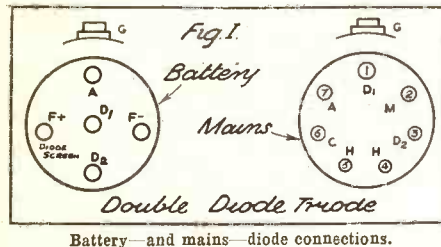
which cover both mains and battery-work- ing valves.

The photo-diagram shows mains valves, but the connections for battery valves are practically identical. In all cases the filament connections go to the same pins as the heater connections—a logical arrange- ment.

And all the other connections are iden- tical except the cathode, which, as you know, is not present on battery valves. So in the case of the latter the cathode pin is a blank, not connected to any electrode; or is completely missing in the case of triodes, screen-grid valves and output pentodes.

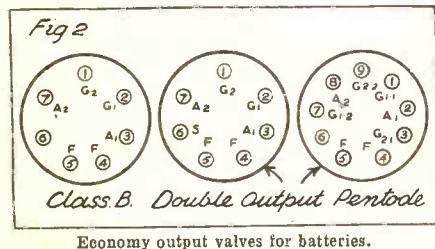
be mentioned that Mr. Scott-Taggart chose four-pin-type H.F. pentodes for the S.T.600 battery receiver.

Apart from the valves shown in the photo-diagram, there is only one other which is to be found in both battery and mains ranges. It is the double-diode triode, and, for some reason entirely unknown to me, different bases are used on the battery and mains types.



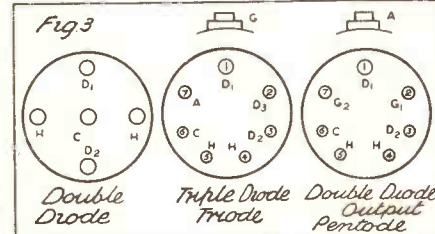
getting down to individual types there is one point I want to clear up.

The diagrams on this page, as is usually the case with those to be found in valve catalogues, show the underside of the valves and not the tops of their valve holders. This means that in the case of valve holders of the baseboard-mounting type the connections must be reversed.



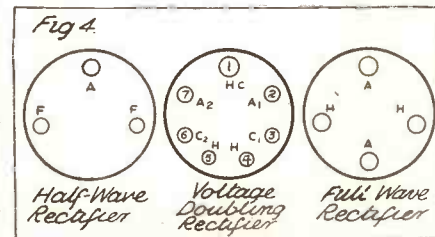
Perhaps you wonder why I could not have reversed the diagrams for you. Well, I could, but it's a toss up which way would be the better. You see, you must remember that many sets these days, particularly those using the modern seven- and nine-pin valves, employ chassis-mounting valve holders with the connections made under-neath. And the view one has of these when wiring them up is the same as the bottom of a valve from the point of view of connections.

First of all, then, we will consider the types of valves in the photo-diagram at the bottom of this page. These are types



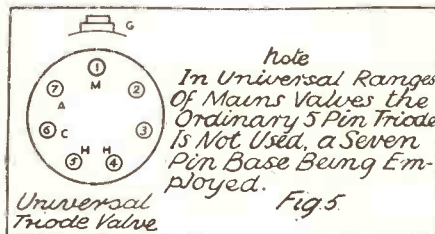
Sometimes the fifth, or cathode, pin is retained for battery output pentodes, in which event it is used for the screen connection instead of the terminal on the side of the valve. As a matter of fact, the side terminal on battery output pentode valves is seldom met nowadays.

The two valves in the upper row of the photo diagram, are the same as those below them, but alternative types of bases are employed. The types of bases in the upper diagrams are not usual for these valves when they are battery driven. But it must



The connections for both are given in Fig. 1. Note that it is important with this valve to see that the filament is connected a certain way round. The correct connections vary with make.

Sometimes directly-heated output triodes and pentodes are incorporated in a manu- facturer's range of mains valves. Their



Connections for seven-pin triode valve.

connections are the same as similar-type battery valves, the fifth pin being provided for screen connection on the pentode.

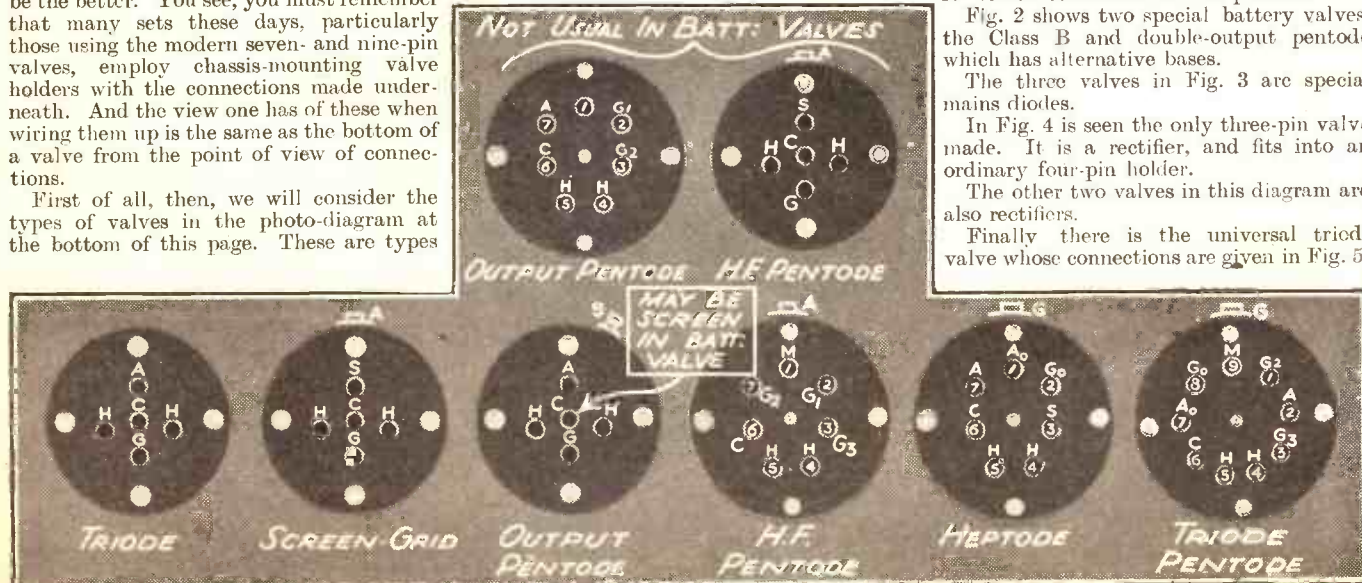
Fig. 2 shows two special battery valves, the Class B and double-output pentode which has alternative bases.

The three valves in Fig. 3 are special mains diodes.

In Fig. 4 is seen the only three-pin valve made. It is a rectifier, and fits into an ordinary four-pin holder.

The other two valves in this diagram are also rectifiers.

Finally there is the universal triode valve whose connections are given in Fig. 5.



All these connections are shown looking at the underside of chassis-mounting-type valve holders. Full details are given in the text.

CRACKLE? — ASK THE P.M.G. ABOUT IT!

THE elimination of the type of interference known as "man-made" static is a subject that is constantly engaging the attention of the country's leading engineers and designers. But much ground has yet to be covered before freedom from interference of this type is universally possible.



The Belling-Lee disturbance suppressor is designed in accordance with Post Office recommendations.

At the present time the difficulty is not so much in solving the existing problems as in keeping pace with the new ones which are created as a result of the phenomenal increase in the commercial and domestic applications of electricity. In fact, the growth is so rapid and the menace to broadcast entertainment is so serious, that there are many who feel that the ultimate solution can only be in the introduction of legislation to prohibit the future installation of electrical apparatus that is capable of causing interference with broadcast reception.

The Ideal Solution.

Undoubtedly, that would be an ideal solution, and, moreover, it is one that should not seriously inconvenience manufacturers of the apparatus concerned.

But that is looking a little ahead. While it is true that the proposed legislation is a subject of constant discussion, the fact remains that for the present, at any rate, nothing can be done other than by good will and by tactful representations to the offending parties.

The position, therefore, so far as the legal aspect is concerned, is much the same with "man-made" static to-day as it was with the blaring loud-speaker nuisance a year or so ago, and, as is well known, it was only by the passing of bylaws in that case, making it a punishable offence "to blare," that the annoyance was finally abated.

Simple Remedies.

Legislation on similar lines for "man-made" static interference may have to come sooner or later; but it is a process that takes time, and in the meanwhile it is necessary to resort to other methods if a way out of the difficulty is to be found.

Fortunately for us the manufacturers have realised that, and they have rendered a trojan service to the listening community by the efforts that they have made to overcome it.

In practically all of the more straightforward types of "man-made" static interference troubles, the simple little suppressor units which have been evolved are 99 per cent effective. Belling-Lee, T.C.C. and Dubilier, to mention just a few of the well-known examples, are all producing suppressor units which, even if they will not in every case effect a complete cure, will at least cut down the interference to negligible proportions.

They are inexpensive, simple to fit and, moreover, they do not interfere in any way with the efficiency of the set.

Obviously, these little devices go a long way towards the solution of the problem, and one can have nothing but



This is the suppressor unit made by T.C.C. It is easily fitted and costs only 10s. 6d.

serious interference which are brought to their notice.

To give some idea of the valuable service that they are rendering, it is of interest to mention in passing that last year they dealt with more than 20,000 cases, and that since the service has been available between ninety thousand and one hundred thousand listeners have benefited.

It Must Be "Man-Made."

It must be remembered, of course, that the Postmaster-General has no powers as yet to compel owners of offending apparatus to take the necessary steps to quieten it; but more often than not, once the trouble has been traced to its source it is usually possible by good will and by sane reasoning to secure the elimination of the interference.

Are you suffering severely from a known or even an unknown source of "man-made" static interference? Did you know that a special section of the Post Office Engineering Department exists to help licence-holders in such circumstances as these? Read how you can avail yourself of this valuable service.

praise for them. But it is unfortunately a fact that not all forms of "man-made" static interference troubles are of the—shall we say?—straightforward type. On the contrary, there are some districts in which the "crackle level" is so high that to attempt to listen to broadcast entertainment is nothing short of farcical.

It is in cases such as these that listeners

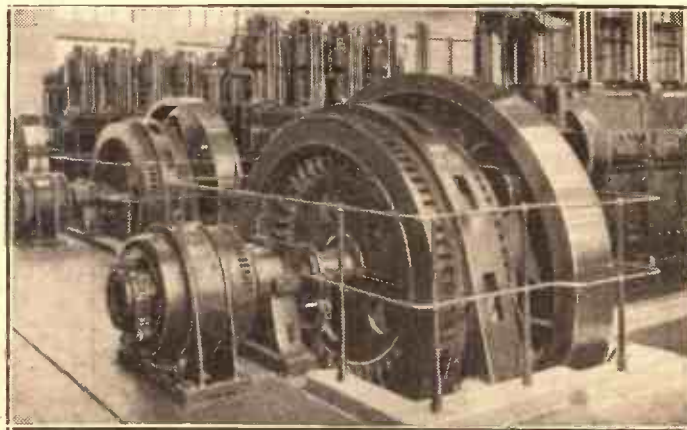
are troubled by interference of the "man-made" static variety, it is well worth while letting the Post Office engineers see what they can do about it. But, of course, it must definitely be "man-made" static as distinct from the static interference which is due entirely to atmospheric conditions. Not even the Post Office engineers can help you in the latter case; but then "atmospheric" interference rarely interferes to any appreciable extent with the reception of the local stations, and those, after all, are the ones on which we chiefly rely.

A Special Form.

But if you are experiencing the "genuine article," so to speak, and your efforts to overcome it by simple suppressor schemes have proved unsuccessful, go into your local post office and ask for the questionnaire form which has been drawn up specially for this purpose.

And when you have duly completed it, send it to the appropriate department. It is a fact that every single complaint receives attention, and if the Post Office engineers do not find a satisfactory solution for you, you may rest assured that there remains nothing to be done other than to move.

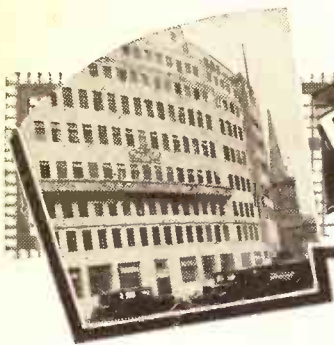
It is a service that you can use, and it is a very valuable service at that. So why not take advantage of it?



Large electric motors and generators can be a prolific source of interference unless proper steps are taken to suppress the trouble at the source.

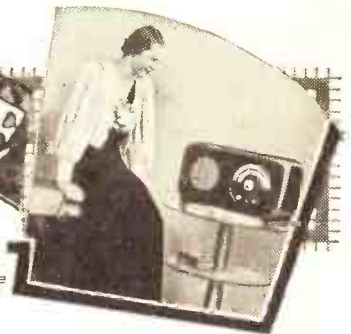
are entitled, if they did but know it, to take advantage of a very valuable service which is available, free of charge, to all licence holders. It is the service rendered by the Post Office Engineering Department.

There is attached to this department a specially trained staff of something like 300 men distributed throughout the country, and it is their job to track down and, if technically possible, to cure all cases of



P.W.'s LISTENERS' SERVICE

The most comprehensive weekly Guide to modern receivers



MODERN SETS DO NOT GO WRONG!

THE question of service after sales is perhaps of greater importance in connection with radio receivers than with any other branch of industry, for the simple reason that it requires only one of the thousands of tiny parts incorporated to fail, and the probability is that a breakdown will result.

It is fortunate that British manufacturers generally have realised that, and it is fortunate, moreover, that while acknowledging the importance of efficient service departments, they have endeavoured to go one better by concentrating upon the production of designs with reliability as the paramount feature.

As a result, breakdowns these days are exceptionally remote, and one very rarely hears of a commercial receiver breaking down unless it is subjected to abnormal treatment.

As some indication of the thoroughness with which the manufacturers set about the attainment of lasting reliability, the procedure which is adopted by Cossor provides almost a classic example.

In the production of their new superhet, for example, the instrument is subjected to no less

Miss Fay Carroll, whose name will be familiar to all cinema-goers, is a confirmed Philco fan. The model which Miss Carroll regularly uses—



OF FILM FAME

EKCO CAR-RADIO ACTIVITIES

ACCORDING to information which has just been sent to "P.W." by Messrs. E. K. Cole, Ltd., there is a rapidly increasing interest in car radio—so much so, in fact, that this well-known firm has been forced to make further factory extensions to cope with the rush of orders.

and with which she is seen here—is the "A.D.C. 1263," which was the subject of a "P.W." Triple Test in the issue dated December 15th.

With the aid of a powerful flood-lighting system, work on the factory extension is being carried on day and night, and it is hoped that it will be ready for use at an early date now. Incidentally, when it is completed, it will bring the total floor area of

the Ekco works up to nearly a quarter of a million square feet.

Ekco are tackling car radio in the usual whole-hearted way that they tackle everything, and they are inaugurating a special training school for car-radio engineers.

As further evidence of the attention that they are giving to this increasingly important aspect of receiver production, the car-radio factory has been equipped with "jolting trays" that will give each set 550 "bumps" a minute for six

"ER . . . JUST A MINUTE, PLEASE"



Was it a solution to one of his amusing "caddies" that claimed such earnest attention from Clapham? Or was Dwyer calling his attention to the quality merits of Portadyne receivers?

than 41 different tests before it is finally delivered to the customer! And they do not rely upon the ears of their operatives alone.

By means of the tell-tale Cossor Cathode-Ray apparatus with which all Cossor receivers are tested, the exact manner in which each part of the set is doing its work is portrayed in lines of shimmering green light. Thus, the result of each adjustment is instantly visible to the engineer.

TRAINING FOOTBALLERS BY LOUDSPEAKER

JUDGING by a recent innovation at the ground of the Sheffield Wednesday Football Club, it rather looks as though a lusty voice will no longer be an essential qualification for football trainers.

In a message from the General Electric Company we learn with interest that the "Supporters' Club" connected with this famous Yorkshire team has presented it with a 12-watt G.E.C. public-address system, complete with turntable outfit and a microphone.

A Good Idea.

As a result, the trainer, sitting at a vantage point in the grandstand, is able to speak to a player during a practice match without any stoppage of play. The advantages of the idea are obvious, and the success which has attended this method of conveying instructions suggests that the idea is likely to be widely copied.

In any case, in view of the unique nature of this experiment, it will be interesting to see to what heights Sheffield Wednesday rise in the Cup and League battles.

Those of our readers who are "Wednesday" fans will be able to hear this apparatus in use, for it is to be used also for providing musical entertainment and for broadcasting announcements to the supporters.

"THAT'S WHAT I CALL GOOD"



Max Miller ("The Cheeky Chappie"), the popular radio, film and vaudeville star, uses an Amplion "Radiolux" on which to receive his broadcast entertainment, and he sums it up as being "the goods."

hours to avoid the possibility of vibration affecting its performance after installation. In addition, cambered floors and turntables will enable practically any type of road surface to be imitated for testing purposes.

With a bit of appropriate scenery the apparatus installed for car-radio testing would have made an absolutely unrivalled Christmas bazaar feature! And yet it is all so very necessary, and the fact that Ekco can take any set for a 50-mile drive without it leaving the factory speaks volumes for the firm's enterprise.

"IN TWO WORDS—IT'S EXCELLENT!"

That is the opinion of our chance-chosen critic this week—an opinion that was upheld by the lady who accompanied him.

WHEN it was suggested to Mr. S. Watkins—who lives at Oakhill Road, Beckenham, Kent—that he should act as unprofessional wireless critic under "P.W.'s" unique set-testing scheme, he hum'd and ha'd a little just at first. He wanted to come, but—well, he was meeting a friend.

"Bring him along, too," I suggested.
 "As a matter of fact," confessed Mr. Watkins, "it's a young lady friend."
 "Could you persuade her to come with you?" I asked, for the feminine point of view

A TWOFOLD TEST



Both Mr. Watkins and his friend, Miss Grieve, had been of the opinion, prior to this test, that only mains-operated receivers would give such a large output as this Marconiphone battery model.

is just as important to most set buyers as that of the mere male.

"Oh, yes!" said Mr. Watkins. "She'd enjoy trying out a wireless set, I'm sure."

And that was how it came about that this week's criticism is a twofold one, coming from Mr. Watkins himself and from Miss Muriel Grieve.

When they were shown into the room where the set was, it was working on the London programme, and it was turned down to quarter volume while the introductions were made. These only took a couple of minutes, and then, before the test, it was decided to take a photograph.

The picture is reproduced on this page, and will serve to introduce the couple and the Marconiphone Model "257" to "P.W." readers.

As soon as the flash-light and camera were out of the way, Mr. Watkins adjusted the volume to really good strength for orchestra reception, and we all listened to the quality over our cigarettes.

This, in itself, is an excellent test, when several people sit round and discuss the moment-to-moment reception. And the first point that emerged from it was an interesting one.

Miss Grieve began by saying that she was surprised to hear such life-like music from batteries. She had always thought that "to get it really loud and like a band" you had to have a set "worked by electricity."

A Welcome Surprise.

We knew what she meant—worked from the mains. And in discussing the point Mr. Watkins said he supposed the battery consumption must be pretty considerable to get such quality as we were listening to.

When he was told that it was normally only about 8 milliamperes for this set, so the H.T. batteries had a long life, he got up and solemnly patted it on the back!

Before sitting down again Mr. Watkins, who is by profession a window-display expert, examined every inch of the set.

He tried it on foreign stations, too, getting one after another with the greatest ease. But at Miss Grieve's request we came back to the London Regional's music, which she was particularly enjoying.

Mr. Watkins, however, proceeded to a re-examination, and eventually he came back more than satisfied.

"Apart from being fashionable, figured walnut is a lovely wood in itself," he said. "And that's beautifully inlaid."

Miss Grieve had already remarked upon the smart modern appearance of the Macassar ebony inlay work on the cabinet, and she also mentioned another point that appeals particularly to the feminine point of view—namely, the "controllability" of the set.

Very Easy to Control.

One knob for tuning, of course, and no blasting of the nearest stations, because there is a sensitivity switch which keeps any would-be-overmastering programme in its proper place unless the maximum sensitivity is required from the set—when all that is necessary is to push in the switch.

There are only two other controls—that for volume, and the combination switch. This latter has positions for long waves, medium waves, gramophone and "Off." "Everything there, and all get-at-able!"

"I shan't ask you about what the circuit is, and all that," said Mr. Watkins, "because I shouldn't understand it all if you told me. But I can tell you what I think about it in two words—it's excellent."

P. R. B.

"..... SPEECH IS PARTICULARLY CLEAR"

says our music critic concerning the reproduction of the Marconiphone Model "257."

AS I continue, week after week, to carry out tests with various radio receivers, I become more and more amazed at the amount of power and quality that the different designers manage to pack into the small spaces at their disposal.

A symphony orchestra, almost complete except perhaps for some of the bass instruments, and giving out a volume that is truly astonishing, can now be packed into a small cabinet. It is all very wonderful.

But what is more startling to a non-radio man like myself is that the same box can produce a singer, piano solo, quartet or organ with practically the same fidelity and with consummate ease. It has all the conjurers beaten.



To facilitate the easy removal of the accumulator for charging the back of the Marconiphone Model "257" is cut away.

True, the reproduction is not quite the same as the real thing—there is a difference that is sometimes noticeable to the musician—but it is too much to expect the imitation to be the same as the real. Rather an impossibility, that would be!

But the difference is not so marked that it really matters from the point of view of musical enjoyment, even to the musician, and I must confess that I find a great deal of recreation in listening to radio. And not only recreation, but education.

My latest radio conjurer has been the Marconiphone Model "257" a battery set that is outstanding for the clearness with which it reproduces speech and vocal items generally.

The violin, too, is well rendered by the receiver, and there is a pleasant balance in the whole reproduction that makes up for any lack of utmost top or bottom of the musical scale.

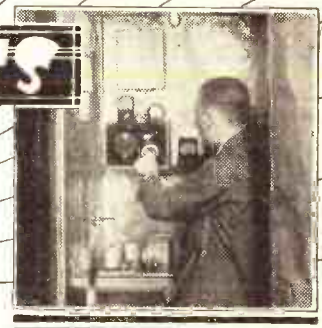


These four magnificent examples of modern radiogramophones exemplify the remarkable advances that have recently been made in the science of sound reproduction, and they are among the most outstanding of all instruments for home entertainment. Reading from left to right, they are: the H.M.V. "Duo-Difusion Autoradiogram Nine," the K.B. Model "366," the Ferranti "Arcadia Autogram" and the Marconiphone Model "292."

TECHNICAL TESTS

NUMBER TWELVE:

THE MARCONIPHONE MODEL "257" BATTERY SUPERHET



A "MAINS" output from a battery receiver has never been a technical impossibility.

The problem has always been one of economics rather more than of technicalities, for the limiting factor in the activities of all battery-set designers has been that of H.T. consumption.

For many years, therefore, the listener with a mains receiver may be said to have had the advantage of greater output power irrespective of running costs, while the battery user has had to be content with the maximum output permissible consistent with economic maintenance.

But that was a state of affairs that could not be tolerated as a permanency in view of the fact that there are more homes in this country without mains than with. Consequently, the activities of some of the leading set makers have been directed almost entirely towards finding a solution to that very ticklish problem.

Comparable with Mains Sets.

To what extent those efforts have succeeded may be gauged from the set which is the subject of our Triple Test this week, for this particular battery model—the Marconiphone Model "257"—is capable of providing a maximum undistorted output of 1½ watts, despite the fact that it takes an average H.T. current of only 7½–8 milliamps.

For the non-technical listener we should perhaps explain that an output of 1½ watts is comparable with many existing all-mains designs and is in excess of what is ordinarily required for normal domestic listening. There is, therefore, with this set, reserve power which can instantly be brought into use by manipulation of the volume control.



The cabinet of the "257" is beautifully finished in figured and inlaid walnut and Macassar ebony.

Then with regard to the H.T. consumption, few, if any, battery designs for loudspeaker operation take less than from 8 to 10 milliamps, so that with this set batteries are likely to last even longer than they do with ordinary types of battery sets in which the output is limited.

From this introduction it will be obvious that this new set of Marconiphone's is no ordinary set. It isn't. From every point of view it is one of the most outstanding battery

designs that we have ever tested, and but for the fact that it has an accumulator which requires charging and an H.T. battery that occasionally requires replacing, there is little to distinguish it in performance from an efficient mains design.

We obviously would not go so far as to say that this battery design challenges comparison with any mains design, for that would certainly be overstepping the mark. But then many all-electric designs are too efficient, remembering the present state of the European ether! There would seem to be little point in receiving every station in Europe at full loudspeaker strength while so many of them lack definite programme value.

With the Marconiphone Model "257" it probably would be possible to get every station, or at least every worth-while station, in Europe at full speaker strength if you so desired, but that is hardly the way in which the majority

dulation, A.V.C. rectification and L.F. amplification.

The A.V.C. is applied to both the heptode and the I.F. amplifier, and in consequence the degree of control is particularly effective. One result of that is that many of the distant stations which are ordinarily marred by fading are on this set quite constant.

The speaker incorporated is of the permanent-magnet moving-coil type, and it combines the features of high sensitivity and wide response. Provision is made for the connection of an external low-resistance speaker, and also for a pick-up which may be left permanently con-



The H.T. battery is divided into two sections in order to secure the highest possible capacity.

TECHNICAL SPECIFICATION

GENERAL DESCRIPTION.—Four-valve eight-stage table-model superhet for battery operation.

CIRCUIT ARRANGEMENT.—V₁, Heptode combining the functions of first detector and oscillator; V₂, high-slope variable-mu intermediate-frequency amplifier; V₃, double-diode triode which performs the functions of 2nd detector, A.V.C. rectifier and L.F. amplifier; and V₄, constant-slope Q.P.21 double-pentode output valve. Full delayed A.V.C. is applied to the first two valves, and the heptode is arranged to be non-radiating. L.F. coupling consists of a parallel-fed transformer.

CONTROLS.—Three in number, consisting of one for tuning, one for volume and one for wave-range and gramophone switching. A supplementary sensitivity control is provided at the back. Tuning dial is calibrated both with station names and wavelengths.

SPECIAL FEATURES.—1. Maximum undistorted output of 1½ watts. 2. Average H.T. consumption of only 7½–8 milliamps. 3. Visual "on-off" indicator to prevent battery wastage. 4. Permanent-magnet moving-coil speaker. 5. Volume control which is operative on both radio and records; and 6. Provision for connection of external low-resistance speaker.

MAKERS.—The Marconiphone Co., Ltd., 210, Tottenham Court Road, London, W.1.

CASH PRICE AND HIRE-PURCHASE TERMS.—11 guineas (which includes batteries and valves), or 30s. deposit and 12 monthly payments of 18s. 3d.

of listeners these days decide upon the set most suited to their requirements.

The average listener's requirements are simply superb quality, a goodly number of alternative programmes, adequate selectivity and, if it is a battery design, economy of operation. The Marconiphone Model "257" gives all of these and more. It is, in fact, the ideal domestic radio installation for those who are without mains.

It is a four-valve eight-stage superhet with full-delayed automatic volume control, and it is fitted in the output stage with one of the Marconi constant-slope Q.P.21 double-pentode output valves. A non-radiating heptode combines the functions of first detector and oscillator, and this is followed by a high-slope variable-mu I.F. amplifier which feeds a double-diode triode combining the function of demodulation, A.V.C. rectification and L.F. amplification.

needed. Incidentally, an external volume control is not required when using the pick-up.

Turning now to the question of our practical tests of this set, there was ample evidence to show that the traditions of high performance for which the name of Marconiphone is renowned are fully maintained in the design of this outstanding battery model.

Extremely Economical.

With our synthetic transmitter and screened-reception cabinet in use the overall sensitivity figures of this set were so exceptionally good that a double check was deemed to be desirable to ensure that no measurements had been incorrectly taken! But the figures were right enough and the selectivity characteristics of the set were of a high order—completely adequate, in fact, for modern reception conditions. No more could be said of any battery design.

Our current measurements, incidentally, showed that the L.T. consumption of the set is 0.8 amp, and whereas the H.T. current taken by the receiver varies in accordance with the strength of the incoming signal, the average over a period of listening to the local station may be taken as from 7½ to 8 milliamps.

In our subsequent aerial tests of this set the performance, as we have previously indicated, was exceptionally good. It is a set likely to satisfy even the most fastidious listener, and with its extremely modest maintenance demands it will be of instant appeal.



We've Seen Twelve

SOME BROADCASTING OLD

IN November, 1922, the first programme of the British Broadcasting Company was sent out to a rather incredulous world from the little studio in the Marconi building.

By Christmas Day people were beginning to talk about "this wireless," and records at Broadcasting House show that on that day there was a programme given by Miss Vivienne Chatterton, Mr. Kenneth Ellis, Mr. Mainwaring and Miss Olive Sturges. On the following day, December 26th, 1922, there was another special programme in which names such as Miss Edna Best and Mr. W. H. Berry were prominent.

In 1922 the regular stage and concert artists fought rather shy of broadcasting. Those who had heard concerts were afraid that their reputations might suffer from rather poor quality in the transmissions. But there were a few enthusiastic souls who dared to brave the terrors of the microphone—and many of them are still broadcasting to-day.

Several of these artists have been persuaded to throw their minds back through more recent radio triumphs and to recall for readers of POPULAR WIRELESS their impressions of those early days when broadcasting really was something of an ordeal.



★
Ronald Gourley, blind pianist. He was born in 1897, losing his sight shortly after he arrived in the world. Has had many years' experience of entertaining, and during the war concert parties in aid of St. Dunstan's kept him busy.

★
RONALD GOURLEY cannot quite go back to the Christmas of 1922 as an artist on the radio, but he was a keen listener in those days, as now, and was associated with the early days of broadcasting.

"I cannot remember exactly when my first broadcast was, but I do remember that Stanton Jefferies held the microphone for me to sing into, while another microphone picked up the sounds from the piano. It was a bright, informal affair, and I must say that I never for one moment felt nervous. As I am never able to see my audiences" (Ronald Gourley, of course, is blind), "radio was not so difficult for me as it was for other people.

"And I remember, too, during those early days, going to Edinburgh on New Year's Eve for a broadcast. Wanting to cross the road, I asked a man to help me. 'What d'ye want helpin' for?' he asked. I explained that I was blind. 'Aye,' he replied. 'I've been celebratin', too!'

"Radio audiences have always been most kind to me during all the years I have broadcast, and I am glad to have this opportunity of wishing them all, through POPULAR WIRELESS, a very happy Christmas and a most enjoyable New Year."

"Going Up to the Cinema."

MAURICE COLE and **WINIFRED SMALL** first met through broadcasting, and were married soon after. Naturally they have much to thank the early days for; as they told me when I saw them in their delightful flat in Notting Hill Gate, both have seen twelve radio Christmases.

"The thing I remember most vividly about the first broadcasts in the Marconi offices," said Maurice Cole, "is the fact that the studio had been, I imagine, a private cinema. At any rate, I know we always talked about 'going up to the cinema' and never mentioned the word studio! There was a cinema screen at one end, I remember, and I think Stanton Jefferies told me that the projection room had been converted to take the transmission apparatus. Captain Round used to come in sometimes during performances and rehearsals and disconnect pieces of wire, much to everyone's admiration. Just what he was doing we never gathered, but it looked very important!

"Another thing I remember very clearly happened just before broadcasting actually started. We had given a demonstration concert before some of the radio manufacturers, and they were all delighted with it. We had agreed to give our services free, but after the concert Stanton Jefferies stood

on a chair, announced that we were all to be paid and solemnly distributed a guinea apiece!"

"One of the most trying experiences was at an early radio exhibition," said Winifred Small, contributing her share to the interview. "We both had to play in a sort of glass cage, with all the visitors to the show walking slowly round outside. All we could see was a mass of black faces, but it felt exactly like being in a revolving tank!"

"A Happy Christmas to all your readers," said Maurice Cole and Winifred Small in unison, "and we are looking forward immensely to starting on our thirteenth Christmas season."



NORMAN LONG, to-day among the most popular of radio entertainers, was one of these stalwarts. In an armchair at his home in Sydenham he tried to remember some of his early impressions.

"What I chiefly remember," he said, "is that everything was great fun. Engineers, announcers, artists and people whose

'WAY BACK IN

Above we see the cheerful smile of Norman Long, with which we always associate the famous "song and piano." Born in 1893, he took up music at an early age, but was in an insurance office for some time before he forsook the stool for the "boards" in 1914, just before the war. On the right is a photograph taken in 1923, when Stanton Jefferies was accompanying a duet by Olive Sturges and Kenneth Ellis. Note



★ Stars of the ether, pioneer expression, old favourites years come to the broadcast or amuse millions of those whose reminiscences in these pages, and their recollections in the minds of many of those who were listeners during those early days at the end of the war. ★

Radio Christmas

STAGERS RECALL THE PAST

... of a new method of art who have for over twelve stinging microphone to enter-unseen listeners. Such are and good wishes are given collections will stir memories our readers who, with us, romantic, historic months of 1922.

... connection with wireless was never quite clear to me rubbed shoulders, very often literally, and treated the whole affair with a genial informality. As you probably know, I was the first entertainer to broadcast, and I have been at it ever since.

Twelve Christmases? Is it really as long as that? Well, here's the best of luck to you all for the thirteenth radio Christmas—and good listening!"

VIVIANNE CHATTERTON, one of the original Christmas, 1922, artists, was my next call.

"It was, perhaps, natural that I should have had early associations with wireless, because Stanton Jefferies happens to be my husband! I remember that first Christmas Day programme most vividly, but what I enjoyed most, I think, were the first Children's Hours. On one occasion, a very foggy night, all the uncles and aunts failed to turn up, and Stanton Jefferies



the old "telephone" microphones and the chimes on which the hours were struck. The lady above is Miss Vivienne Chatterton, who met Stanton Jefferies at 2 L O and, later, married him. She is a soprano and radio actress who has appeared frequently during the twelve years in which she has been associated with the B.B.C. She is the youngest of ten children. Incidentally, her dog "George" was the first dog to broadcast.

and I had to keep the ball rolling. We actually pretended to be all the missing people, and from what we heard afterwards it was quite successful!

"After my very first broadcast a friend in Hendon went into almost a delirium of excitement at recognising what came over the headphones as a voice.

"Two other little things still stand out in my memory. One is the picture of Stanton Jefferies having to announce, 'This is 2 L O calling the Deal and Walmer War Memorial Hospital,' and being terrified at getting it mixed up. The other is being asked to hold a microphone over a 'cello'; as I hadn't the slightest idea where the sound came from, I spent half the time holding the mike over the little holes and the other half keeping it as near as I dared to the bow!

"As one who has seen twelve radio Christmases, I wish you for 1934 all that you wish yourselves."

"They Were Grand Days."

HELENA MILLAIS, the popular entertainer, is another of those whose broadcast experience goes back to Christmas, 1922. You no doubt remember her success a short time ago when the B.B.C. gave a variety concert of artists with experience from the earliest days.

"I have always been grateful," she told me, "that I was allowed to help at those early broadcasts. I remember speaking into a telephone mouthpiece suspended from the ceiling by a piece of string; I remember when the microphone became impressive and silk covered; I remember the notices saying, 'Remember If You Sneeze You Will Deafen Thousands'; but, best of all, I remember and treasure the letters from listeners into whose lives I was able to bring a little sunshine. When a man writes and tells me that, as a result of a broadcast of mine, his wife, in hospital and in great pain, has smiled for the first time for years, then I feel that broadcasting is really worth while.

"But there was a time when I very nearly threw up the idea of wireless altogether. I had gone to Manchester to broadcast and, as it was pouring with rain, I took shelter in a wireless shop. There was a loudspeaker going, and I heard a soprano singing. The song was so distorted that I very nearly burst into tears and went home!



"But they were grand days, and I enjoyed every moment of them. And now, for this thirteenth radio Christmas, let me give you this wish: 'Good times are coming—don't worry. Whoever you are—whatever you are—I wish you happiness.'"

"The Same Enthusiasm."

Finally, in his office at Broadcasting House, I sought out **STANTON JEFFERIES**—programme arranger, announcer, accompanist and "uncle" of the first programmes of 1922, and now in charge of important musical broadcasts in the balance-and-control department.

"Please send every Christmas wish to your readers," he said. "As a matter of fact, I always remember at this time of year the first Christmas spent in broadcasting, thirteen years ago almost, in a little room which used to be a cinema at Marconi House.

"Here a small company of early enthusiasts—I believe you've met some of them, haven't you?—broadcast good wishes and programmes to a few thousand listeners by means of equipment which included a soapbox, a telephone microphone and a piano!

*



Helena Millais is an entertainer who specialises in character sketches. She has been a firm favourite with radio audiences over the twelve years during which she has broadcast.

*

"These conditions provide a remarkable contrast with the organisation of to-day. But the same enthusiasm still characterises the work in 1934, when our programmes are heard all over the world."

THE YEAR 1922



THE threatened withdrawal of the Regional Nationals will not be applied after all. The results of the early weeks of the full working of Droitwich do not give an assurance that the curtailment of the Regional facilities would be justified.

This decision raises the new problem of finding waves for North of Scotland and Newcastle. The plan now is to synchronise these stations with one of the Regional waves. But some experimenting is still necessary to determine the best way of dealing with this difficulty.

Anyway, it will come as a relief to many listeners that the Regional services are to remain much as they are for at least a year or so more.

Future of the Empire Service.

Mr. Cecil Graves, Director of the Empire service of the B.B.C., who has been laid up for some weeks, is not likely to be fit for duty again for many months. No decision has been taken about his work in the interim. This work has become increasingly important, not only from the B.B.C., but from the national and imperial points of view. It is likely that a temporary replacement will be made pending Mr. Graves' restoration to health.

Radio Drama in 1935.

Mr. Val Gielgud, the versatile and able Drama Director of the B.B.C., has an ambitious programme for 1935. Three big Shakespeare productions and three more "Famous Trials" will be offered early in the year. There will be a new series of short foreign plays not exceeding half an hour each. The first of these, "A Farewell Supper," from the famous "Anatol Dialogues" of Schnitzler, will be given in January. The author of "Quarrel Island" has written a new production specially for the microphone. This will be called "The Mystery of the Temple," and will be given in February.

London Music Festival.

That the B.B.C. is already thinking about plans for the great Jubilee celebrations in May is clear from the outline of the London Music Festival to be given from May 10th to June 14th. There will be eight special public concerts at Queen's Hall, the conductors being Adrian Boult, Serge Koussevitzky and Arturo Toscanini.

B.B.C. in War.

As part of the general "test mobilisation," skeleton rehearsals of which are to be held during 1935, the B.B.C. will be called upon to "stand by," as it would do in a real war. Naturally, its instructions are as much a secret as any other of the emergency measures the Government would apply in the event of a war.

Of course, the constitution of the B.B.C. would automatically lapse, the Board of Governors and the Director-General taking

orders from the Chief Civil Commissioner under a Defence of the Realm Act. Limited programmes of entertainment would continue, but the talks would be superseded by official information and instructions. Hostile action would be directed against the wavelengths, but fear of reprisals would ultimately defeat this.

"Songs from the Films"—New Series.

John Watt is starting a new series of programmes from the popular "Songs from the Films" for National listeners on Tuesday, January 1st.

The success of the recently broadcast



A new photograph of the B.B.C. Dancing Daughters, taken during a performance in one of the Saturday night Music Hall programmes. Kneale Kelley, conductor of the B.B.C. Variety Orchestra, is in the foreground.

sound picture of Walt Disney's film, "Three Little Pigs," has induced Mr. Watt to include in each of the "Songs from the Films" one of the Silly Symphony cartoons. The "Three Little Pigs" broadcast

review the outstanding programme events of 1934.

There are some others, of course, such as the Meluish burlesque "The Fifth Form at St. Pontefract's," motor trials and hill climbs, and commentaries and eyewitness accounts of old ceremonies and customs. But I have told you sufficient, I hope, to whet your appetite for what promises to be an enjoyable last-of-the-year programme.

Forecasting 1935.

I have already referred, although quite briefly, to an interesting feature in the Regional programme of Saturday, December 29th, in which experts will attempt to prophesy the 1935 developments in their own particular spheres.

The feature will be compered by Mr. J. L. Hodson, and among the items will be an attempt by Mr. R. A. Watson Watt to foretell the weather for 1935. Madge Garland (Fashion Editor of "Vogue") will predict women's fashions, and Sir Malcolm Campbell will prophesy what he thinks will be the outcome of the traffic problem.

The trend of economic development will be left to Geoffrey Crowther to deal with. Ritchie Calder will say how he thinks 1935 will affect medical science, while R. H. Naylor will attempt to foretell in popular vein how the stars will affect the fortunes of the coming year.

It is hoped to obtain the forecast of C. W. A. Scott, the winner of the Melbourne Air Race, as to the developments of fast inter-Empire air service.

"Hogmanay Nicht."

We should all be terribly disappointed if Scotland failed to put up a good show of broadcast programmes to mark the passing of the Old and the coming

of the New Year. The programme builders seem to have done their job efficiently, as usual.

Hogmanay Nicht will be marked by an exchange of programmes by Edinburgh, Glasgow and Aberdeen, the three Scottish broadcasting centres. A little healthy competition should produce some good results, especially as the night will be young, namely 7 p.m., when the "swap" is due to begin.

The Regional transmitter will not, however, close down until 1 a.m. on New Year's Day, half an hour after other British stations have finished radiating, and dance music by Jack Chapman and his band will be relayed from the Albert Palais de Danse, Glasgow.

On New Year's Day the principal feature will be "Scottish Hour," an entertainment of song and dance from 11 p.m. until midnight.

Practically the whole of the Regional staff at Scottish Broadcasting House will contribute to this entertainment, which should be good fun. Broadcast officials who

(Continued on page 578.)

MEDIUM-WAVE NATIONALS TO STAY

The Latest News About Broadcasting

produced a heavy and appreciative correspondence from listeners, so that many people will look forward to hearing the new Harmony Trio in the Silly Symphony on January 1st, which will be based on the film, "The Pied Piper."

Percy Edgar Looks Back.

Broadcasting House has a fine library of recorded programmes, and who knows what historical value it will have in the days when most of us alive to-day are gone and are forgotten? But why wait until then? Even in these infancy days of wireless, recorded programmes can come up, fascinatingly fresh.

Do you remember the broadcast one dark night last February from the top of a giant mast, eight hundred feet high, at the G.P.O. wireless station at Hillmorton, near Rugby? Looking back now, it was one of the "high spots" of the year's broadcasts arranged by Midland Regional, and as such it will be heard again on the last day of 1934, when Mr. Percy Edgar, the Midland Regional Director, and Mr. H. J. Dunkerley, his Programme Director,

ON THE SHORT WAVES

Conducted by W.L.S.

WE are told that minorities always suffer. As yet we short-wavers must consider ourselves a minority, and although we haven't really *much* to grumble about we have just one or two grievances.

The chief trouble is the small variety of special components available for short-wave work; and, subdivided into another "grouse," the worst of it is that there has been no attempt at standardisation.

Take this matter of short-wave coils, for example. If only four or five manufacturers could put their heads together and consult some reliable short-wave designer, with a view to the marketing of a really efficient and cheap short-wave coil, what a boon it would be!

They could all produce their own particular versions of it, but the general shape and size of the coils, and the wiring of the base, would be standard.

Make them Interchangeable.

Isn't that a lovely dream? And isn't the present position of short-wave coils more of a nightmare? Look at the three types shown in the photograph on this page. All are efficient and work admirably, but in the wildest flights of imagination one couldn't call them interchangeable (or cheap, either!).

I believe that if I took a ballot among readers as to the most popular type of short-wave coil the old two-pin plug-in type would head the list by 1,000 per cent or more. And that has practically disappeared off the market!

It was cumbersome, it is true, but one could arrange two or three of them at will, whereas the three four-pin types shown on this page rather cramp one's style when, for instance, one wants to arrange inductive aerial coupling.

Two or three firms do make six-pin plug-in coils with three windings, but they need an entirely different type of base, which complicates the problem still further.

What Every Constructor Wants.

Two or three firms have introduced "all-wave" short-wave coils with a scheme for wavechange switching, but they have all been different in shape and size and haven't always worked on the lowest wave-range.

I am firmly convinced that what every short-wave constructor wants is some *standard* form of short-wave coil, and one that he can buy from his favourite manufacturer. If such a dream isn't fulfilled

quite early in the coming year I, for one, will be very disappointed.

Meanwhile, most of us will continue to make our own coils, all of us using different wiring schemes for the bases, thus complicating matters a little further. *What a muddle!*

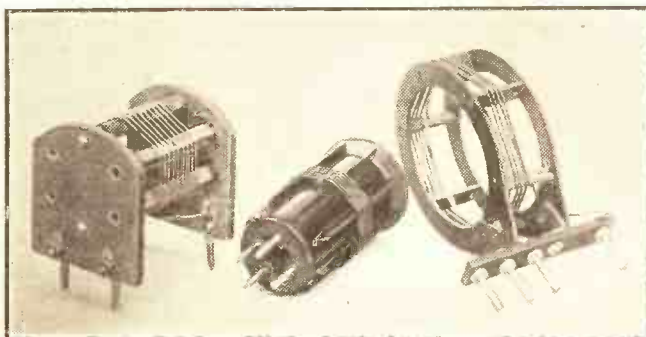
COIL CONSIDERATIONS

Our short-wave expert has a few suggestions to make concerning tuning units for the ultra-high frequencies.

Let us examine the special requirements of a short-wave coil. First, the detector-grid coil, which is the critical one. It must, first and foremost, have a low D.C. resistance. A few years ago I might have put "first and foremost" a low self-capacity, but now I don't think it matters two hoots.

A fairly high L/C. ratio for tuning is certainly desirable, but if we have *too* much inductance and *too* little capacity our set becomes terribly insensitive and is also liable to be unstable. So a spot of self-capacity in the coil won't matter.

TYPICAL SHORT-WAVE COILS



W. L. S. says of these coils that "all are efficient and work admirably," but at the same time he puts forward a plea for more standardisation in the matter of mounting.

Next I put dielectric losses. If *good* dielectric material is used I don't object even to a coil that is "flat-wound" on a solid former. I prefer one on a ribbed former, though, especially one of the "skeleton" type.

But I *do not* subscribe to the popular beliefs of the great "low-loss" era, which started way back in 1926. Everyone went mad then, and insisted that coils should be self-supporting; that plug-in connections ruined their performance, and that a metal component within yards of a coil

would result in a terrible loss of signal strength. What a lot of bunk we did believe then!

The fact of the matter is that each of the types of coil shown in this photograph is very efficient indeed. They each have a spaced winding of thickish wire for the grid coil, and a reaction coil of thinner wire, close-wound and very tightly coupled.

I have always insisted that a small reaction coil tightly coupled is far, far better than a big one half a mile away, but still some folk don't seem to have got that idea into their heads.

If you *do* use two-pin plug-in coils always see that the reaction coil holder is mounted close up to the grid coil, and use as small a reaction coil as you can. If, on the other hand, you happen to have a commercially made four-pin plug-in coil, and the reaction winding is large and a long way away, about the only thing you can do is to write to the manufacturer thereof and tell him what you think of him.

Standardise the Wave-Ranges.

Another thing that we ought to be able to standardise is the wavelength range covered by each coil. At present you may buy coils from one firm which cover 13-26, 22-47 and 41-94 metres with a .00015; from another those which cover 18-30 28-52 and 45-80; and from yet another a set covering 16-28, 27-48 and 39-65.

Why, in the name of fortune, shouldn't we decide on three convenient bands and arrange among ourselves that all coils should roughly cover the same bands? We should *begin* to know where we were.

One of these days I've got to design a short-wave set and goodness knows what I am going to do about this coil business. For if I pick on any particular manufacturer's product it makes it difficult to use alternatives, since

their bases are all different and an interchange will mean altering to some extent the layout of the receiver.

If any reader likes to help me to start the ball rolling by writing and telling me which general type and shape of coil he prefers I shall be very glad. Call the three types in the photo, reading from left to right, "A," "B" and "C." But don't necessarily stick to those three types, and if you have a particular private brain-wave please let me know roughly what it is.

We've got to straighten this thing up somehow—and quickly!

ON THE SHORT WAVE —Page 2.

THE COMING YEAR

Good Prospects for 1935

THIS, being the last time we shall meet in 1934, seems an appropriate occasion for me to wish all my readers a Happy New Year. As all we short-wave maniacs know, every year is a happy one for us. Whatever the weather, whatever the state of the various kinds of depressions, whatever the state of the lining of the pocket, what do we care?

We have *always* plenty to do and think about—far too much to allow us to brood over circumstances. In fact, our only black moments are those when we encounter trouble with our short-wave receivers and become as ordinary people for a day or so.

Build a Simple Set.

I hope one or two of those "ordinary people" are reading this. I like to rub it in to them that they're missing more fun than they can possibly imagine. And, after all, it's entirely their own fault, for they have only to build a simple set to have the world at their finger-tips.

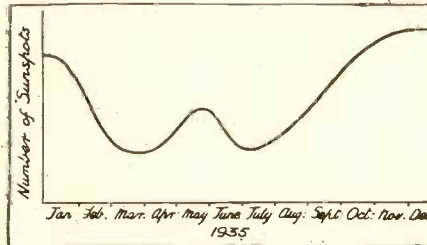
But no! Some of them think short waves are "too difficult"; others that they mean "getting up early"; and yet others scorn the whole affair as a set of old wives' tales and don't believe a word they read.

Never mind; that needn't worry us! But

it does leave me with a sneaking feeling that we're a little bit selfish. And my conscience is not too easy, for did I not tell a near neighbour of mine (who, of course, doesn't know who I am) that short waves were no good at all? And why? Why, just because I don't want squeals from a badly handled receiver spreading all over my little slice of ether.

Just to show you that there is a prospect of a decidedly Happy New Year I have reproduced on this page the prophecy of the sunspot experts. Our friend, the Eleven-Year Cycle, has been continued for 1935, and that's what it looks like.

NEXT YEAR'S PROSPECTS



Here's a curve showing the 1935 sunspot conditions according to the meteorological experts.

You will notice that as you read these words, and for about a fortnight after, conditions may be expected to be really good. After that (perish the thought!) they will drop off until about the end of March, after which the "subsidiary" (7½-monthly) peak should begin to make its presence felt.

This should assure us of good conditions throughout May and June, after which

another falling off occurs. By the middle of August, however, we are well away up the slope, and by the end of the year we should all be bursting with glee.

The brightest part of the whole thing, however, is that the "dull" periods do not go down nearly so low on the curve as they have been doing for the last three or four years. That is to say that even the troughs that you see in March and July should represent better conditions than we have been getting on former peaks.

Helping Short-Wave Development.

Now for another point. What are we going to do, in 1935, to help short-wave developments along? We can all do a little. I, personally, should like readers to volunteer to plot a curve showing the strength at which they receive some particular station at a given time, every day for three or four months. We might be able to learn a tremendous amount from such a graph, and if a couple of dozen readers in different parts of the country would do it the mass evidence accumulated would be enormously interesting.

Of course, you must have reliable gear to do it with, and you mustn't keep changing your receiver about; but you don't need anything elaborate or expensive. I have "watched" W3XAL at 4 p.m. every day for the past month, and compared my rough curve with another, plotted by a friend two miles away, and they don't check up in the least. Now, if we could only get a similar one from somebody in the Midlands or up North, and see which one it looked like, we might learn a lot.

W. L. S.

WELL, here we are again at the jolly festival of Christmas! These notes are to be published on Christmas Eve, and though I fear I cannot tell you the traditional ghost story, or for that matter refer you to any new thriller on a record, I can and do wish you all a Right Merry Christmas.

For some reason best known to themselves the gramophone people have done very little with mystery or thriller records. H.M.V. brought a few out some time ago, but since then I have not seen any. It is a pity, for I should have liked to put you on to something that would make your flesh creep this Christmas. The nearest I can get is Stanley Holloway's *With Her Head Tucked Underneath Her Arm* (Col. DX 603).

But there is plenty of fun to be had, and I hope you will all get your full share of it.

I am sitting in my study wreathed in clouds of smoke from the cigarette I am smoking, and I can assure you that the oft-repeated warning of the radio and gramophone dance-band crooners that

Smoke Gets In Your Eyes is only too true. It *does*, especially when you are typing. Still, I should know better than to woo My Lady Nicotine after the insistence of our vocalists. I have been warned often enough.

As I expected, all and sundry are busy flogging that haunting number by Harbach and Kern, and it is possible to get a record of *Smoke Gets In Your Eyes* in crooner, "straight" vocal, dance-band, orchestral, piano and goodness knows what other versions. It is sweeping the country, and it is quite beyond me to give any true idea of the vastness of the selection of records of it that are available.

But two I must mention, for I should like you to hear them. The first is by Elsie Carlisle on Decca F 5289 for fans of the peculiarly fascinating style that the famous lady crooner of Ambrose's band adopts. The second is sung "straight" by Turner Layton of the popular duettists. This is my favourite record of the number. It is Columbia DB 1472.

I wonder how many of you heard the recent broadcast of Gracie Fields from the Hippodrome at Rochdale. Those who did will sympathise with those who did not, but the latter may take some consolation from the fact that several of our leading comedienne's numbers are available in the latest H.M.V. list.

The screamingly funny item in which Gracie tells of her quandary concerning the birthday gift of a nudist was one of the most hilarious moments in the broadcast, and the song can be found on H.M.V.



B 8232, together with *Isle of Capri*, which Gracie sings with consummate artistry.

The House is Haunted was another of Gracie Fields' items from Rochdale, and this is to be found on H.M.V. B 8233. The other side contains *How Changed is the Old Place Now*.

Decca have decided that the kiddies shall not be forgotten this Christmas, and they have brought out half a dozen really fine records of nursery rhymes. There is a selection by Frank Luther, with novelty accompaniment, under the title of *Mother Goose*, and this takes up three records (F 5309, 5310 and 5311).

Then we have Jack Parker with complete rhymes on F 5261 and 5262. Finally, we have that universally popular story of Walt Disney's *Three Little Pigs*, as rendered by John Watt in his "Songs From The Films" broadcast a few weeks ago. A special pictorial label is provided on the disc, and it is sure of great popularity among the small folk. (Decca F 5312.)

For the older children, you and me, there is a new recording by Harry Tate of his famous sketch *Fishing* on Regal-Zono MR 1483. It will be remembered that the same artist's historic *Motoring* was issued by the same company earlier in the year.

We somehow expect good news at Christmas time, and this year we are not to be disappointed. Albert has returned! You will remember how he met a sad "end" at the paws of Wallace, the old sorenosed lion, in the Blackpool zoo, and how the ferocious beast, annoyed at the attentions of poor Albert and the stick with the 'orses 'ead 'andle, "swallowed the little lad whole."

That, we thought, was the end of the story and

of Albert. But the miracle has happened. Wallace was so disconcerted in toothless gum and aged interior that he decided to "stage a come-back." So young Albert returns to the bosom of his family, to his father's great disappointment.

The whole story is told by Stanley Holloway on Columbia DX 650, together with another episode in the life of Sam, who is "learning" marksmanship. Don't miss these two excellent party records: *Albert Comes Back* and *Marksmen Sam*.

Thousands of Reginald Dixon fans will welcome the latest Regal-Zono recording of the organ of the Tower Ballroom at Blackpool. It is called *Dixonland*, and covers a dozen of the biggest hits of the day. It is an exhilarating record, on which the popular organist excels himself (MR 1497).

Another record for the youngsters is to be found in the Regal-Zono catalogue this month. It is by the Corona Babes, who are invited by the Pied Piper to take a trip to Nurseryland, and we hear them transported on the toy train "and meeting Old King Cole, Bo-Peep and other characters of the nursery rhymes. None of the Corona Babes is more than fourteen, and they have been booked for pantomime. Try this record on your kiddies; it is a disc for children by children (MR 1487).

I wonder if those Babes are anything to do with that artistically precocious broadcaster Hughie Green.

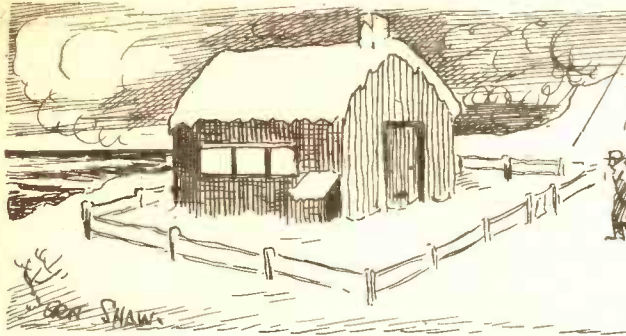
At the last moment H.M.V. have made a special issue of two of Walt Disney Silly Symphonies. *The Wise Little Hen* and *The Grass Hopper* and the *Ants* have been recorded on H.M.V. B 6555 by Raymond Paige and his orchestra. The record was made in Hollywood so that the characters whose voices are used in the films could take part.

Three more records before I bid you farewell till the New Year; both will be welcome, I know. The first two are by the veteran baritone Peter Dawson, who has re-recorded some of his best sellers, *The Floral Dance* and *The Lute Player* (H.M.V. C 2698), and also the favourite of yesteryear, *Trees*, together with *Little Prayer I Love*, with organ accompaniment (H.M.V. B 8244).

The third disc is one that is full of the Christmas spirit—a *Paul Jones* by the New Mayfair Orchestra (H.M.V. C 2709).

I have just found a "ghost" record in the latest Decca list, by Anona Winn. It is called *The Ghost of the Turkey* (F 5319). And on that note I will leave you to your parties, your radio and, not least, to your gramophone.

K. D. R.



The LAST WORD

OR CUPID'S CHRISTMAS

By Ariel

The story of a coastal wireless operator—a man who would not admit defeat—and a girl.

AT 2 a.m. on Christmas morning, in the year 190—, I was alone on watch at a certain coastal wireless station, a dreary limbo of galvanised iron on a cliff's edge by the sea, arctic in winter and forgotten all the year. I had relieved Crosshaw two hours before, and, slamming the telephones on to my head, I had prepared to follow the clock's hour hand round eight slow revolutions in an atmosphere of ill-burnt paraffin oil.

Heigho! Only three o'clock. I shifted my position, cast a spanner at Sir 'Enery, the station rat, who lived like a lord on the cable insulation, and lit a pipe. Then I tilted back my stool, lifted my feet on to the bench and leaned my head against the door.



"All right—I see your point. Now see mine!"

As my head made contact someone rapped sharply on the door. The shock made me tingle all over, and I dragged off the telephones and flung open the door in no sweet temper. There stood a man, muffled up in a great-coat. He made as though to enter, so I deterred his progress by putting my fist on his chest. "You can't come in this way, Santa Claus. Try the chimney," I said.

Can You Speak the Maori?

My visitor pushed back his hat and coat collar and revealed himself as a man of some twenty-five years.

"This the wireless station?"

"Yes."
"Well, look here! I want to send a message—urgently—or you'll lose touch with the ship. Can't I—"

"You cannot. Hand your message in at the proper office. I'm only an operator."

"But—I say, you know—this is most frightfully important. Can't you make an exception?"

"My principals leave me no discretionary powers. I'm a wireless operator, not a diplomat."

"Well—as a favour, then."

"Sorry! My job here is all that stands between me and farming. I hate farming. My aunt says that phosphates are the ultimate vulgarity."

"All right, then. I see your point. Now see mine."

It was a nice little Colt, with a strong, persuasive personality. I realised that I

had spoken hastily and against my better judgment.

"Clasp your hands behind your neck and get inside," said the stranger. And I gat.

"Now, how soon can you speak the Maori?"

Knowing that I could communicate with her at once, I naturally replied:

"About noon."

He smiled.

"Guess again. I saw her pilot come ashore at Pike Point. What about a trial tap now, just to see what happens?"

The Story is Unfolded.

"Well, if you keep me here, clasping my hands like those girls in the French Salon pictures, I can't do anything except cuss at you. Lay the barker down—barker is, I believe, the correct word—and I'll do what I can."

He placed the Colt in his pocket, saying: "Right—but no tricks!"

"It's no trick, I assure you. Absolutely the real stuff," I murmured as I kicked open the door and tackled him low.

Out we went, twining like the ivy. But the fellow must have trained with octo-

puses, for three times I shook him off and as often he reattached his tentacles to my person. I remember that we rolled through a bed of thistles together and that I had to brake hard with my heels to keep us off the incline which led to the

edge of the cliff. His middle name was glue.

At last I saw the futility of the scuffle.

"Hang it all!" I gasped. "What-ho about peace on earth? My ma wouldn't approve of this sort of free-for-all on Christmas Day. Let's go in and talk it over."

He borrowed a pin or two to reafix his sleeve to his coat, and I mended his braces with copper wire. Then we had coffee from my thermos and I lit my long-deferred smoke.

"Come on," I said; "let's have it."

"It—it's about a girl I'm engaged to. She's an American, a Miss Victoria Vanderbloom. By the way, my name is Brown. My father—perhaps you've heard—'Brown's Bottled Beetroot—always fragrant.' Well, she came over for the wedding and now we've had a Number One Beeze.

"You know these American girls? Pretty

independent! Yes. She said that a woman's privilege is the Last Word, and I said that I couldn't recognise that principle officially. In the end we made a bargain. She said that the affair was off and that she was going home next boat, but that if I could get the Last Word on her before she set foot in America she'd cave in and be a model wife.

"Before I could blink she had nipped out of the room and locked the door. Then she yelled 'Last Word' through the key-hole and bolted. Ginger, that girl! As she stepped off the pavement to her car I got in a Last Word from the window. She sent one back by a District Messenger. I wired one, care of the Maori's purser, and then, like an idiot, went to see the boat leave. As the ship moved off she shouted 'Last Word' and dived below. I countered with one which I sent out by special tender, and she returned the compliment by the same route. So I'm done, except for this wireless."

"But, don't you see, she can wireless back?" I said. "You're beaten to a bright-green finish."

"Yes, but suppose you failed to receive it—eh, what?"

I Did the Trick . . . But

"Think of my professional pride! Besides, some other station would serve her purpose. Oh, by gum!—I've got it! I'm allowed about fifty free words a month. Suppose I send the message with instructions for it to be delivered to the lady after the ship has docked? What a winner!"

"Love's servitor!" he murmured, harse with excitement.

And so I did the trick. The Maori's operator replied, O.K. O.M. DLY DKSE NYK," and passed on his lawful occasions, nursing a pretty romance in his breast, I'll bet. Brown nearly wept, collected about a pint of buttons and pieces of braces and went home to await cables. But he sent a case of whisky to the station, which made that Christmas even more memorable.

Alas! Some two weeks later I received from a passing cattle boat a radio addressed to Mr. Brown. It read, "What price this for Last Word?" and was signed "Vic."

The *eclaircissement* came in a letter from Brown. He said:

"Your man gave her the message on the

(Continued on page 578.)

"I caught the full force of Mrs. Brown's eyes."

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"I caught the full force of Mrs. Brown's eyes."

A CHRISTMAS LETTER

Below we publish an unusual letter we have received from Mr. Scott-Worthington, Managing Director of the famous Peto-Scott Co., Ltd., so well known to readers as suppliers of receiver kits.

DEAR Mr. Editor,
Here's a Christmas story I should like to tell to you and all your readers.

So come, all ye thousands of readers, and you, Mr. Editor; and, Mr. John Scott-Taggart, would you mind Dr. Roberts sharing your armchair so that G. T. Kelsey and W. L. S. and the rest of the "P.W." Staff can gather round? That's better. Now let's have some soft music from Berlin. Just give that Extractor condenser a touch and give Droitwich the go-by. We don't want jazz for the moment.

Once upon a time there was a race of very clever people who lived on an island whose streets were lined with orange groves. These people were fond of building wonderful instruments, by means of which they could get music and speech from the air. They could converse with their friends who could not be seen because they were thousands of miles apart.

"The People Grew Lazy."

The skill of these people became so great and their demand for gadgets grew so fast that some very Wise Men from the East came to the island, whose streets were lined with orange groves, and built great halls to make these gadgets. At the same time there appeared some Wise Magicians who wore large horn-rimmed spectacles; these Magicians prepared some wonderful writing, accompanied with weird symbols drawn in white on blue parchment.

Then there came some wicked robbers who tempted the islanders with instruments that were ready built, so that the people grew fat and lazy and lost the art of making such wonderful instruments for themselves.

So the Wise Men from the East got tired and no longer studied the

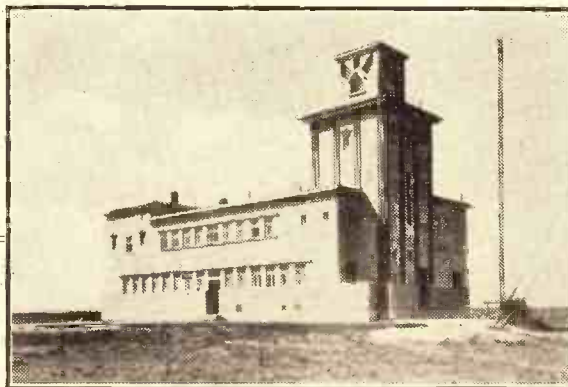
writings and symbols of the Magicians in horn-rimmed spectacles.

After a few years the peace of this happy island, whose streets were lined with orange groves, was disturbed by the wailing of the Builders of Instruments. They could not hear the music from their favourite friends across the seas because terrible monsters sent forth such terrific howls from tall structures which they had built of steel. Then the cry of the Instrument Builders rose forth. "Give us new writings and symbols to combat these howls of the monsters," they cried unto those Magicians in horn-rimmed spectacles.

"A Wondrous Writing."

Then there arose from out of his armchair one of the Magicians in horn-rimmed spectacles, and he brought forth a great and wondrous writing and prepared such a marvellous parchment of symbols that all the Instrument Builders in the island, with its streets lined with orange groves, rose up with one voice and acclaimed these writings and symbols the most wondrous of all time.

The Magicians sent forth word to the Wise Men of the East to prepare their halls and to make ready for the Builders of Instruments great quantities of gadgets. To the Merchants in the market place he urged them to fill their stores with gadgets; but the Merchants heeded him not: all



Unique among Europe's broadcasters is this building housing the Bucharest transmitter. Bucharest works on 364.5 metres.

THE Bucharest station is some miles from the Roumanian capital, and upon stepping from my taxi I was rudely challenged by the Hounds of Bucharest, a pack of watch dogs. The engineer comforted me: "Soldiers can be bribed or made drunk, but our twelve dogs are most reliable watchguards."

The transmitter itself is of familiar 1929 design, and possesses no unusual technical features; but the building is of novel architectural design, and incorporates comfortable living quarters for the engineering staff. The 86-metre vertical antennæ are suspended from two 96-metre masts, 225 metres apart.

A Peculiar Mascot.

I discovered the palatial offices and studios of the Roumanian Broadcasting Company in the Rue General Berthelot, where the officials and the mascot—a

half-grown fox—cordially welcomed me. I learned that the State owned 60 per cent of the shares of the company, which has been in operation since 1928, and received 30 per cent of the licence fees,

except one named Petra the Scott (which name signifieth the Rock from Scotland), and he alone gathered in great stores of gadgets.

Some of the Wise Men of the East were busy engaged on their pleasures and other business, and little did they take heed. "The Merchants will not buy," they wailed.

Then the cry of the Instrument Builders went forth, and they surged around the halls of the Wise Men of the East, clamouring for gadgets.

"Give us the wherewithal that we may build the Wonder Instrument according to the writings and symbols of the Magician in horn-rimmed spectacles," they cried.

"Worked Far into the Night."

At last the Wise Men from the East paid heed to their cries and gathered in their craftsmen. They set their giant forges to work, they lashed their minions into speed and more speed, and worked far into the night, that the Instrument Builders might be appeased.

The crowds about their doors went home and built with such wonderful success that many others came and heard for themselves; and so in time they clamoured about the halls of the Wise Men from the East. They, too, demanded more gadgets.

And now you have all heard the Christmas story of how the S.T.600 is causing many manufacturers to forgo their sleep, to cram their works with extra machines, to search for miles around to find competent labour. The executives of my firm have almost forgotten what their homes look like, and the wife of Peto-Scott has become an S.T.600 widow.

However, if there are any disappointed S.T.600 constructors reading this, may I offer them my sincere apologies and plead circumstances beyond our control? We as a firm have done our best, but the demand has grown so suddenly and beyond all imagination that human nature cannot cope with such a rush.

Wishing you and all your readers a Very Merry Christmas and a Happy New Year,

Yours sincerely,
The Peto-Scott Company,
Limited.

W. SCOTT-WORTHINGTON,
Managing Director.

which vary according to the location of the listener. The number of registered listeners was 100,000, but there were many pirates, and plans were being made for invading their lairs.

Striking Decorations.

My tour of the studios was most interesting. In its main studio, measuring about 70 feet by 60 feet, Bucharest has one of the finest broadcasting halls that I have seen in Europe. With its artistically draped walls and its ceiling dotted with bright electric lamps, the studio makes an impressive sight compared with many Continental chambers, and, I was told, its acoustical properties are excellent.

The other principal studio is about 30 feet by 18 feet, while there are announcement rooms and minor studios. Indeed, the interior decorative design of the building is particularly striking.

C. W. L.

GUARDED BY DOGS

A visit to a strange European station.

half-grown fox—cordially welcomed me. I learned that the State owned 60 per cent of the shares of the company, which has been in operation since 1928, and received 30 per cent of the licence fees,

TELEVISION

A SPECIAL PRACTICAL SERIES FOR ALL READERS

By L. H. THOMAS

This week the question of motor speed in relation to synchronising is fully discussed, and an explanation is given of the apparent greater difficulty of obtaining correct motor speed when a synchroniser is employed.

NOT long ago I was having a talk about television with quite a knowledgeable friend of mine, and I happened to show him a letter from a reader. The substance of this letter was the complaint that, since the said reader had fitted synchronising gear to his televiewer, he found it *more difficult* to obtain a steady image than he had done before.

On reading this my friend burst into what the novelists call "fits of uncontrollable laughter." All of which only goes to show how little some people know about their own pet subject.

The reader was perfectly correct—up to a point—and my friend was quite wrong in laughing at him. And now it seems to be up to me to explain why. Just glance at the three diagrams on this page.

Fig. 1 represents the control knob of the motor rheostat on your televiewer when no synchronising apparatus of any kind is used. There is only *one setting* for the correct speed, and the slightest deviation from this, on either side, will immediately cause your images to drift upwards or downwards.

If the variable resistance has a fairly low value, which is very desirable, the "drift" will not be too violent, and the finding of the one perfectly correct setting will be a rather easy matter. Once found all the movement that will be necessary to hold a steady picture will be some small amount of compensation for variation in the value of the resistance as it heats up, and perhaps decreasing friction in the motor itself.

The Effect of Synchronising.

In other words, the motor speed will probably tend to increase slightly during the transmission and the resistance value will have to be reduced bit by bit to compensate for it. But at any given instant of time there will be only *one* correct setting for the control rheostat.

Let us now imagine that you have fitted synchronising gear to your televiewer and that you have a moderately strong signal through the coils. Everyone who has handled a televiewer fitted with "sync" will be familiar with the effect. Fig. 2 shows the *correct setting* of the control rheostat, still in the same place, but now a

little "latitude" is allowable before you lose the picture.

In other words, if you cut down the amount of resistance in circuit by a small amount, instead of a rapid drifting upwards of the pictures, you will merely see a kind of feeble attempt at doing so. The image will appear to "rock" slightly in its frame, as if trying to break away and race upwards, but the "sync" will hold it.

When The Picture "Breaks Loose."

When your rheostat is moved past the limit of the "latitude," however, the pictures will apparently "break loose"; and since, by that time, you have reduced the resistance in circuit quite a lot, the motor will speed up with a rush and the pictures will probably disappear in a series of diagonal streaks.

Precisely the same thing will happen if you *increase* the resistance in circuit. When you get past the downward limit of

is a very strong one, and almost invariably, when "sync" is fitted, you will find the operator making frantic movements of the control knob and apparently never getting anywhere near the right speed.

The obvious thing to do is to fit a switch to cut out the signal flowing through the synchronising coils. One is then compelled to find the correct setting of the rheostat and the correct motor speed. This having been done, the "sync" can be switched in, and the pictures should be held steady.

When one is burdened by mains that vary severely in voltage, or with a motor that hasn't been properly made to run at a steady speed, even when it is supplied with a steady voltage, I am convinced that the synchronising gear gives the effect of exaggerating the speed variations.

Unknown to the operator, the mains voltage may have increased a little, so that the motor is trying hard to run faster and is just held in check by the synchronising impulses. Then the "last straw" arrives,

and, true to the proverb, it breaks the camel's back. The motor suddenly jumps out of step, and, before one knows quite what has happened, the pictures are "running upstairs" at a prodigious rate.

Regarding that switch and its position in the circuit. If

your synchronising coils are simply wired straight in series with the neon tube, all you have to do is to wire up a switch to "short" them out of circuit.

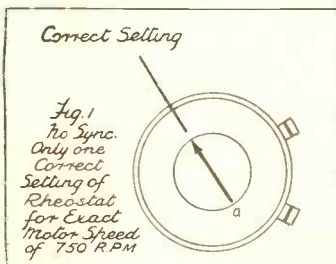
The Switch is Important.

If you have a separate synchronising stage feeding the coils and nothing else, you want a switch in its anode circuit—in series with the coils; or, again, you may do it by short-circuiting them.

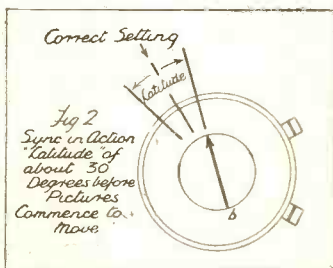
I seem to have been dealing with synchronising problems at some length, but they are, after all, one of the greatest worries with which the novice to television has to contend.

From now onwards I intend to deal with methods of improving the television receiver (as apart from the televiewer itself) and with other methods of scanning. The disc is at present the cheapest and most popular, and I have accordingly kept exclusively to it.

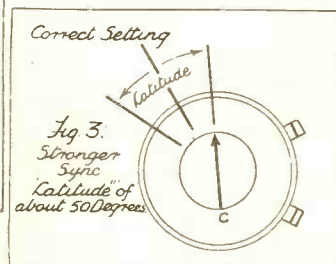
SYNCHRONISATION



when ordinary synchroniser gear is employed; and, lastly, when strong synchronising is in use, such as when a special synchroniser stage of amplification is introduced.



AND MOTOR SPEED



tolerance the motor will break out of synchronism and will be running much too slowly.

Now consider Fig. 3, which shows what happens in the case when one has a really strong synchronising signal, which really holds a dead-steady picture. You will have more "latitude" still in either direction, but it follows that if you just overstep its limit the amount of resistance in circuit will have deviated so widely from the really correct value (as shown by the centre line) that you will have lost your pictures well and truly.

Then the trouble begins. Seeing that the motor is apparently running *much* too fast, you will abruptly reduce the value of the resistance, and, before you know where you are, it will be running much too slowly again.

It's hard luck to blame this effect on the synchronising gear, because the entire fault lies with the operator, really. But the effect

RADIOTORIAL

The Editor will be pleased to consider articles and photographs dealing with all radio subjects, but cannot accept responsibility for manuscripts or photos. Every care will be taken to return MSS. not accepted for publication. A stamped, addressed envelope must be sent with every article.

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

All inquiries concerning advertising rates, etc., to be addressed to the Advertisement Offices, John Carpenter House, John Carpenter Street, London, E.C.4.

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

QUESTIONS AND ANSWERS

FITTING A MICROPHONE TO WORK THE LOUDSPEAKER.

C. O. (Bishop Auckland, Co. Durham).—“In Mr. Scott-Taggart's ‘Manual of Modern Radio’ figure 4 shows a simple microphone circuit.

“I want a means of communication from a person ill in bed upstairs to the living-room downstairs. Is this practicable? If so, your particulars, showing parts required, would be of great assistance to a worried household.

“I am the satisfied possessor of an S.T.500, and although I know little about technicalities I am an avid reader, and have been for years, of ‘P.W.’”

The diagram to which you refer illustrates the principle of the telephone admirably. But what you want for the invalid is not an arrangement to set up sound waves from a simple telephone—which would be much too weak for your purpose—but one which will operate the set's loudspeaker.

This can be arranged quite easily, since the output from a microphone is an L.F. voltage, of the same type as is produced by a gramophone pick-up. And the “Manual of Modern Radio” has full information upon the means by which a pick-up can be applied to a set.

In general, the output of a microphone circuit can be connected up to the “gramophone” terminals of any receiver, which will then give amplification of the microphone just as though it had been intended for the purpose.

So if your set has a pair of “radiogram” terminals, fix the leads from the microphone to them and try it out. You may find it necessary to adjust grid bias a little and to take care that the microphone leads are kept reasonably short, but probably the arrangement will work straight away.

Volume control can be arranged quite easily, also on the lines indicated in “The Manual of Modern Radio,” for any particular set.

Finally, when purchasing a microphone the manufacturer's literature should be read carefully, since different instruments have differing transformers, etc., and it may be necessary to experiment a little before perfect satisfaction is obtained.

But if you remember that a microphone circuit's output can be treated like the output from a gramophone pick-up, you should have very little, if any, trouble in getting the desired results from your set.

BETTER RESULTS FROM THE “POWER” THAN FROM THE “SUPER-POWER” VALVE.

G. S. (Formby).—“It is a most disappointing result to find, after the expense of a super-power valve, that I do not get such loud reception as from the 220P.A. (power).

“I am sure everything is in order, H.T. and L.T. and G.B. having been tested for both valves, and with good instruments. But it is quite plain to notice a drop in the strength when the super-power is in, although I bought it because the set is not giving me the power at the loudspeaker that I should like to get.

“Can you suggest anything?”

We are sorry to say that you evidently bought the super-power valve under a misapprehension. The truth is that it was never intended to do what you are expecting it to do.

You say that “the set is not giving me the power at the loudspeaker I should like to get.” Obviously,

then, you need to feed more power into the loudspeaker. And the way to do that is to improve the input to your set very considerably (such as by substituting a good outdoor for a poor indoor aerial), or else to make the set amplify its present input to a much greater extent than at present.

How? By adding an S.G. stage, or by inserting extra L.F. amplification, or by the use of an output pentode. (There are other ways, too, but the foregoing are the chief and easiest ways to choose from.)

You have not chosen either of these ways, but you have purchased a super-power valve instead. And the sole merit of a super-power valve is that it can handle a big output from the set distortionlessly.

So, unless you have a big output from the set, you cannot employ a super-power valve to advantage. And that is why your super-power valve has proved a disappointment to you.

“THE ‘0001 THAT IMPROVES THE TONE.”

S. H. (Leeds).—“In one of the back ‘Recommended Wrinkles’ there was a bit

NEXT WEEK.

The next issue of Popular Wireless will contain a special article on

FIXING EXTENSION LOUDSPEAKERS.

This article, which will be essentially practical, will deal with such important points as the most suitable type of loudspeaker to use, how to run the wires from the receiver to the extra loudspeaker, and the correct method of arranging the connections.

ORDER YOUR COPY NOW.

about a ‘0001-mfd. condenser for improving selectivity. Quite by accident I discovered, when trying this, that I could send you a far better Wrinkle about ‘The ‘0001 that improves tone.’

“What I did was quite unintentional, but it has proved so satisfactory that I am keeping it permanently unless you tell me I am doing harm. To explain, all I need say is that I had an ordinary ‘0001-mfd. condenser with a lead (flex) on each terminal. I had been putting it in aerial, etc., but, finally, when one side of it happened to be connected to earth, I touched the other flex lead from this condenser on one of the loudspeaker's transformer terminals.

“At once I noticed an improved tone of reproduction—kind of softer and fuller, with no stridency on speech. So I left the condenser like that, and I hope there is no objection to keeping it there.

“It makes no difference to anything else—selectivity, H.T. consumption, etc., being absolutely as before. But tone is better, as I

can prove any time by undoing the condenser lead. I shall be glad to know what you think of it.”

You are experiencing an effect which is quite common, and to which we have often referred. And you will be glad to know you are doing no harm, so you can continue as at present.

What is happening is that you have shunted some of the high notes (of which you had a preponderance) to earth via the small condenser. Provided the condenser is of good quality, it will do no harm at all.

In most sets we want all the high notes for good speech quality. But sometimes, especially when a pentode is employed, it may be necessary to by-pass some of them, and that is what your condenser is now doing.

THE IMPORTANCE OF SCREENING.

J. L. (Tottenham).—“The set (Class B 4) is a bit too lively and boomy. Do you think this might be caused by the use of ordinary insulated wire?”

“I thought this would do instead of the screened wire, which, being metal, I was afraid to use because I had a short the only time I tried to use it.”

There is a vital difference between ordinary insulated and screened wire. And the use of the former instead of the latter in a high-magnification set might make all the difference between success and failure.

If the original design used screened leads for any or all connections you must do the same. There is no possibility of trouble from shorting if you are careful with the insulation during construction.

CONNECTING THE MILLIAMMETER.

J. B. (Ramsey, Isle of Man).—“In the S.T.500 will a milliammeter connected to the terminals of a split-pin anode adaptor, into which the H.L.2 valve is fixed, give accurate results for tuning?”

“This query is prompted by the reply given to a correspondent recently in ‘P.W.’ It was pointed out that for the correspondent's set it was not correct to connect the milliammeter in the above manner.”

It is definitely preferable to insert the milliammeter in series with the high-tension lead at the feed terminal. (This is H.T. + 2 in the S.T.500.)

If a split-pin adaptor is used the leads to the milliammeter are made to carry both high-frequency and low-frequency currents, and there is a possibility of slight instability being caused. (This practice may result in a change of reading, too.)

When the milliammeter is inserted in the high-tension feed lead at the input terminal only direct current is passed through the instrument.

The great advantage of the split-pin adaptor is the rapidity with which it may be inserted as a testing device.

CONSTRUCTORS' SUCCESSES WITH S.T.600

(Continued from page 561.)

ALL WORTH-WHILE STATIONS COME IN WITH EASE.

Dear Sir.—Well, I've got my S.T.600 working, and although I have built upwards of a score of different sets, this one is the top notch of the batch up to the present.

With the S.T.600 all the worth-while stations come in with ease, and, what is most pleasing, one at a time.

Basingstoke is not one of the best places for reception, and that, to my mind, makes the S.T.600 all the more likeable. Having built a number of sets, I can say, with strong conviction, anyone who will take the little trouble to put the S.T.600 together will have a receiver that will hold its own against the best.

I kept strictly to your list of components, as I have previously found out it is the best policy in the long run to follow the author's or designer's layout.

Wishing you every success,
CHAS. TYSOE, 3, London Road, Basingstoke.

VERY PLEASSED WITH RESULTS.

Dear Sir.—I have built the S.T.600, and I am very pleased with the results I get from it.—T. CROSLAND, 410, Wimble Road, Southfields, S.W.19.

FOR CONSTRUCTORS

Details of an efficient H.T. battery and a very ingenious visual-tuning indicator.

Wet H.T. Batteries.

There are only the two alternative sources of supply for H.T., and these are batteries or the mains. Where there are no mains the listener is confronted with three different forms of battery supplies.

The most widely used is the dry battery. This is a convenient and compact type which has much in its favour. The great drawback is that a dry battery wears out and cannot be revived. At least, it cannot be made to give more than a definite amount of current—speaking in terms of ampere hours.

An H.T. comprising a bank of accumulator cells, on the other hand, does not suffer from this disadvantage. It can be recharged. But it costs much more to buy in the first case, and then there are the recharges to consider.

It is true that these will cost only two or three shillings each time, but the battery has to be taken to a charging station and collected, and it is a pretty heavy article to transport.

Further, there are many listeners who neither have the mains nor easy access to them for accumulator charging—particularly country listeners.

For such as these the third type of H.T. battery offers great attractions. This is the "wet" battery, comprising an assembly of small Leclanché-type cells.

The first cost will be a bit more than that of a dry battery, but its cells are rechargeable in the home. All that has to be done is to obtain a supply of refills.

The Wet H.T. Battery Co., of 26, Lisle Street, London, W.C.2, are specialists in the design and manufacture of wet H.T. cells, and they are able to produce them in a form which renders refilling a simple and expeditious task.

Their refills consist of full replacement elements. There is a sac (a technical term to describe something not unlike a trim and tight little sack), with terminal, zinc and rubber bands assembled and all ready for use.

The non-acid solution needed is made up from special chemicals which cost only a few pence. The cells are contained tidily in small glass jars, and trays are available for holding them securely.

The No. 4 size of the "Standard" H.T. battery is capable of operating the largest of battery sets, and



The Wet H.T. battery consists of a number of cells containing replaceable elements rendering the refilling a simple task.

it costs 40s. for 90 volts and 56s. for 126 volts. The refills cost 53d. each. Separate cells are obtainable at 8d. each complete.

Such a battery will run a four-valve set for a long period before refills are needed, and creeping and evaporation of the fluid are prevented by a special oil which is supplied.

The "Standard" battery is certainly a proposition which it will be in the interests of many carefully to consider. We ourselves have used this type with great success and found them able to stand up to any normal demands with every satisfaction.

Climax Visual-Tuning Indicator.

SOME form of visual-tuning indication is quite essential on a set fitted with A.V.C. if quality is to be preserved. "Tune points" cannot be accurately found by the ear alone, and any departure from them is liable to introduce distortion, particularly if the set concerned operates on the superheterodyne principle.

So far, visual tuning has been almost entirely confined to commercial sets; but now, owing to an invention due to Climax Radio Electric, Ltd., of Haverstock Works, Parkhill Road, Hampstead, London, N.W.3, it has become a practical proposition for the constructor.

Messrs. Climax have embodied their new principle in a complete unit which is suitable for use on all A.C. mains sets with automatic volume control.

The great feature of the Climax system, besides its adaptability to existing receivers of the suitable type, is that the light indication is provided by a two-volt lamp of the "pea" type. Not any two-volt "pea-lamp" can be used, of course, but only one of the special kind provided.

The unit works in a most ingenious manner. We believe the idea is a quite new one and it is extremely effective.

A connection is taken from the heater circuit of the set and current led to a small transformer. The

magnetisation of the core of this transformer is effected by the anode current in the A.V.C. controlled valve or valves.

Thus the efficiency of this little transformer is varied, and more or less current is passed out by its secondary as the anode current changes.

This secondary current is taken to the indicating lamp, and so its brightness is caused to vary as the set is taken in and out of tune.

All very simple; but a transformer "valve" of this kind is a most original adaptation of known principles and, in our opinion, constitutes one of the most outstanding inventions of the year.

The unit is a quite small affair, being about the size of a tuning coil of medium dimensions. It is completely enclosed by a metal case arranged for chassis mounting, and clearly coloured leads are supplied for connecting purposes. There is also an instructional leaflet giving full details for connecting and operating the device.



The Climax Visual-Tuning Indicator is quite small, being roughly the size of a tuning coil of medium dimensions.

Not that there is much adjustment to be done. There is only one adjustment, in fact, and this takes the form of a small screw at the top of the article. This is merely for obtaining the initial adjustment when the unit is first incorporated in a set.

The screw is varied until the brightness of the light to suit individual requirements has been obtained.

If anyone has the idea that the unit merely provides a dull red light in the little lamp (which can be fixed anywhere on the panel) of indeterminate brightness, he is quite wrong. The light range is flexible, wide and definitely positive. In short, the unit is as successful in practice as it is ingenious in conception.

THOSE PROGRAMME INTERRUPTIONS

"Question Time on Tower Hill"—Jack Hylton's Broadcast—Famous Trials No. 4—An Excellent Talk.

BROADCASTING from the studio may be safe from the menace of that new type of nuisance—the programme interrupter. But in public places such as St. George's Hall no such safety is guaranteed. The fact that there have been one or two attempts to interrupt relayed programmes during the last six months shows that something must be done immediately to nip the movement in the bud.

Even if the B.B.C. should exercise the greatest care over the issuing of tickets of admission to St. George's, it is still comparatively easy for a would-be interrupter to gain admission there. It is obviously a case for the law. The next offender should be prosecuted and heavily fined. That would stop it.

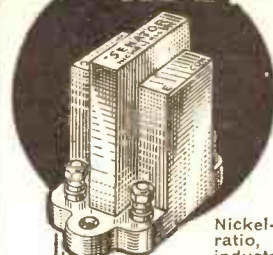
Broadcasting has always catered well for the religious minded. At the present moment there are

several series under way (or is it "weigh"?) but none, I think, that claim our attention more than Dr. Donald Soper's series "Question Time on Tower Hill." Of course, we expect no incomprehensible "isms" here. But we do get a variety of perplexing questions answered in a way that carries conviction. For instance, Dr. Soper's explanation of human suffering, as he sees it, was the most rational that I have ever heard of this question.

I didn't care much for the brand of sentimentalism in Belle Baker's song which she dedicated to all the mothers of the world. This sort of stuff would make most mothers I know writhe.

(Continued on next page.)

BULGIN NICKEL ALLOY TRANSFORMER

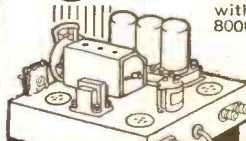


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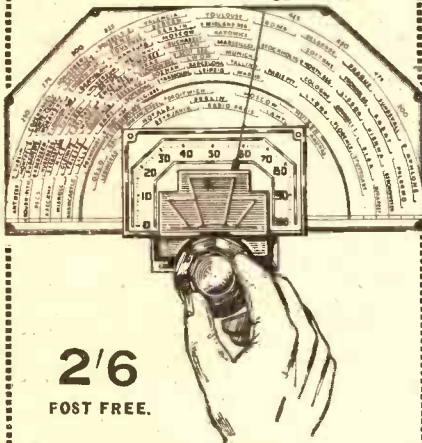
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Please send by return post one S.T.600 Ivory Dial. I enclose Postal Order 2s. 6d./2s. 9d. to cover all costs.

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Every Month - - Price 6d.

All you want to know about Radio from every angle.

THOSE PROGRAMME INTERRUPTIONS

(Continued from previous page.)

A correspondent writes to me with much heat protesting against the danceless nature of the programmes of many of the dance bands now broadcasting. Frankly, this fact hadn't struck me as a great cause for complaint, though I can quite see that the dance fiend with a passion for dance rhythms would find the many potpourris, sketches, impressions, etc., included in dance-music programmes a bit exasperating.

I notice Jack Hilton called his broadcast "An Entertainment Hour." It surely was—every minute of it. Each turn, I thought, might, if enlarged, have been at the top of a variety bill. Wasn't that trumpet just grand? No, you couldn't dance to it, I know! But any dancer would have willingly sat out to listen to it.

Another correspondent writes agreeing wholeheartedly with my remarks about the big-cast plays. Bernard Shaw's "Village Wooing" prompted him to write. I wish somehow he had read what I wrote last week about this play before he sent me his criticism. He says of "Village Wooing": "It was delightful—only two characters. One couldn't wish for anyone else. I don't know whether to say the man was better than the woman or vice versa. Perhaps it will be best to follow the example of the referee in the recent boxing match and call it 'a draw'."

This letter interested me particularly in view of my criticism of "Village Wooing." For one thing, it confirmed my opinion that big-cast plays demand too much concentration and rob the listener of much of his enjoyment. It also shows that simplicity cannot be too extreme for some listeners.

"Famous Trials No 4"—the Tragical History of the Honourable John Byng—lacked the movement of its predecessors. Instead, we had long speeches like Byng's defensive speech. In time this became a reading only, in spite of the chorus that was yelled at odd intervals, and which, for all the repetition, remained not understood at the end.

Sir Josiah Stamp's "Causes of War" talk must rank with the B.B.C.'s best. Obviously a learned talk, yet it was one to appeal to all classes of listeners, more especially because of the manner of it.

A word of congratulation is due to the little fellow who read the lesson at the children's service relayed from the Church of St. Mary, Redcliffe, Bristol. Indeed, I think the whole congregation of kiddies are owed a big pat on the back for their very enthusiastic singing. Well done, children!

C. B.

MEDIUM-WAVE NATIONALS TO STAY

(Continued from page 570.)

never broadcast at any other time of the year will be at the microphone, all helping to sing songs and doing their share in "kicking up a noise."

Moving Birmingham?

Bishop Neville Talbot, of Nottingham, has been asked to preside at a light-hearted debate arranged for Midland listeners on Friday, January 4th, upon the subject of whether or not Birmingham is too near to London.

At the moment I do not know the other speakers, but there are undoubtedly so many aspects to the question (quite apart from the fact that, however much it is discussed, nothing can be done in the matter) that it will probably be an interesting and amusing broadcast.

Western News.

New Year programmes in the West Region look passable without being exactly exciting, but few people will be surprised at that.

Some carols, sung in Welsh and in English by the Nantyllyfflon Juvenile Choir, and a radio dramatisation of Sabatini's famous tale of buccaneering adventure, "Captain Blood," will be among the last broadcasts of 1934. But January 1st will start off with a relay of the Civic Service, arranged by the Council of Evangelical Churches, from Wood Street Congregational Church, Cardiff, at which the Lord Mayor, members of the Corporation and representatives of other important local bodies will be present.

The church can accommodate three thousand, and there will be few empty seats when Dr. Martin Lloyd-Jones, who was a London specialist before his ordination, enters the pulpit to give his address.

The programmes will probably improve as the New Year progresses, because I see that on Saturday, January 5th, listeners are to hear "Cornish Conversations (with variations)," which is really an old Christmas Eve programme.

Salvation Army in a Cathedral.

A Salvation Army band playing in an Anglican cathedral is an event not to be heard every day of the week; by which I mean that the broadcast by the Coventry Salvation Army Band from Coventry Cathedral on Sunday, December 30th, is so unique that many will take care not to miss it.

The band, which has just celebrated its jubilee, is famous for its playing of hymn tunes. It has many distinctions in "Army" annals, at the Crystal Palace and elsewhere. It was the only provincial band present at the first post-war Salvation Army Bandmasters' Council Festival at Clapton Congress Hall. Its music should sound particularly fine in such splendid surroundings, acoustically and otherwise, as Coventry Cathedral will provide.

On the same day Midland Regional is putting on a programme by the Swadlincote Glee Singers, who come from a small industrial centre in the South Derbyshire coalfield, and later the first Regional broadcast by Cantor Wolf Lewi (tenor), who is the First Reader at the Birmingham Hebrew Congregation. Cantor Lewi is a native of Poland and has sung with great success in most European countries.

O. H. M.

THE LAST WORD

(Continued from page 573.)

gangway, as agreed. But she's a tough nut, like her old man. She saw one of her father's freighters lying near and made them send a boat and take her aboard, where she stuck tight till they sailed. However, you thought of a solution, sure enough; for if she were to continue to play the game by the rules, she would obviously have to spend her life at sea or never touch America. So I've chucked up the sponge, provided she marries me next week, which makes me an easy winner."

They visited me at the station in the spring, and when I caught the full force of Mrs. Brown's violet eyes I told Brown that Bottled Beetroot was a vile thing.

"Don't worry," he replied laughingly. "It's bottled in Pa Vanderbloom's Vinegar!"

CONNECTING A PICK-UP

Jottings of Interest to All

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

OFTEN enough when you try connecting a pick-up to your set you may be rather disappointed because the reproduction is not up to expectations. It may be that the amplifier of the receiver is working perfectly well on radio signals, but does not work so well when the pick-up is connected in. You may think this is rather curious; at first sight you would imagine that the amplifier would work exactly the same on signals fed into it, whether from the high-frequency end of the radio set or from the pick-up. But the fact remains that the receiver often works quite differently in the two conditions.

Condenser and Resistance.

A good plan, if you are disappointed with the results on connecting in the pick-up, is to join a condenser or a resistance across the pick-up terminals. You may find that a condenser alone will have the desired effect, or a resistance alone. Again, it may be that neither of these will be sufficient by itself, and you may have to use a combination of condenser and resistance. Assuming you try a resistance by itself in the first instance, this may be, say, 10,000 ohms; it is better to use a variable resistance of this maximum value, and then you can try the effect of different values. As regards the condenser, a preset condenser of, say, 0.001 microfarad may be used, and this will often do the trick. If, however, neither of these is satisfactory, then you can combine the two by putting them both across the pick-up terminals in parallel with one another.

Adjusting the L.F. Amplifier.

A certain amount of adjustment will, of course, be necessary in the values both of the condenser and of the resistance, but it is well worth a little trouble, and it is surprising, once you get the values right, how greatly the tone is improved and the extraneous noises (such as needle scratch, in particular, in this case) are reduced.

It is no good just connecting the pick-up into a receiving circuit and expecting the reproduction to be exactly the same as it was on the radio. You will almost invariably find that a certain amount of adjustment is necessary in order to get the amplifier operating in the same way on the pick-up as it does on the radio signals.

Frequency Calibrations.

I often receive letters from readers on the question whether tuning condensers should have a dial calibrated in frequencies, wavelengths or degrees. It is quite common, nowadays, of course, to mark them in degrees and in wavelengths, and many sets also have the names of the stations printed alongside the appropriate wavelengths. As to whether they should be marked in frequencies, this is a much debated point. With straight-line-frequency condensers it would be easy to use a dial calibrated in this way.

One of the points that arises is that the actual setting of the dial will depend upon

the coil used with the condenser. If everything is done properly, however, this only means tuning the condenser to a known wavelength or frequency and then shifting the dial so that the figure corresponding to that frequency comes into the right position, the dial being then fixed so that it cannot shift in relation to the tuning knob. There is the question of medium and long waves to be considered, but this can be got over by means of a second circular dial which is adjustable in position.

Medium and Long Waves.

Without going into details, you can see that there is a good deal to be said, from certain points of view, for calibrating a tuning condenser in this way. It is curious, however, how tastes differ in this matter and how ideas change from time to time. It is only some four or five years ago that straight-line frequency was all the rage, whereas nowadays one seldom hears it mentioned. For the ordinary listener the ideal thing is the marking of the names of the stations on the dial. After all, nothing can be clearer or more unmistakable than that; but it has the disadvantage that it takes up a lot of space, and, moreover, if changes should be made in the set at any time, or if any of the stations marked on the dial should change their wavelength, this is apt to upset things.

Will the Condenser Last?

Talking about condensers, I was asked the other day whether I thought there had been any really important improvements in variable condensers during the past few years.

This is rather a difficult question to answer. It is not easy to see how any very fundamental change can be made in a condenser at all, but there certainly have been improvements in the mechanical arrangement of condensers and very great improvements during the past three or four years. The trimmers in ganged condensers, for instance, have been very greatly improved and give much more uniform adjustment. Another point is that the size of condensers has been greatly reduced, owing to greater precision in the arrangement of the vanes.

Permeability Tuning.

People often ask me whether I think that we shall go on using variable condensers indefinitely, or whether these will be entirely superseded by some other form of tuning. This, again, is a very hard question to answer, and the only thing that might displace the condenser as a means of tuning, which we know of at present, is the permeability tuning scheme with coils. There is also an arrangement for using a variable resistance in place of the variable condenser, but it is rather early days to talk about this, and we do not yet know what its value may turn out to be. Permeability tuning seems to have great possibilities, and it is not by any means impossible that we might be able to use it instead of condensers entirely.

Detector Overloading.

With the ever-increasing refinements and efficiency of modern receivers there goes hand in hand an increasing liability to distortion from one cause to another. The causes of distortion are numerous, but one of the commonest of them, although not necessarily producing the worst type of distortion, is detector overloading. High-

(Continued on next page.)

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CONNECTING A PICK-UP

(Continued from previous page.)

frequency valves now give us such an enormous amount of H.F. amplification that we are rather apt to forget that we are pushing on to the detector a greatly increased load as compared with that of bygone days.

Do You Notice Distortion?

I mention this little point in passing because I have many a time heard sets which apparently pleased their owners but in which there was, to my ear, detector overloading undoubtedly taking place.

One of the signs of detector distortion is the over-emphasis of the high notes; and another very noticeable feature in some cases is the double-tuning effect, more particularly on loud signals. When this happens you get the signal tuning-in at two points closely adjacent, instead of at the proper tuning position, which is intermediate between them.

A further effect which you will often notice when the detector is being overloaded is that the reaction control, or, for the matter of that, any form of volume control prior to the detector stage, will seem to be ineffective on loud signals. This is particularly the case if a screened-grid valve is used in the detector position.

Try Changing Grid-leak Values.

To get over the effects mentioned above you might try increasing the anode voltage on the detector and changing the values of the grid leak and condenser. You might try $\frac{1}{2}$ megohm up to 1 megohm for the grid leak and, say, 0.0001 microfarad for the condenser (if you are working on short waves the grid leak can be increased quite a lot, up to perhaps 3 megohms).

Should you not be able to get over the distortion by this arrangement, it will be necessary to cut down the strength of the incoming signals, or rather the strength of the signals passed on to the detector. One way to do this is to put a volume control prior to the detector, and a good scheme is to use variable- μ valves in the H.F. stages.

Cutting Down Aerial Input.

Another arrangement which you can use is to put a resistance of, say, 50,000 ohms (when using a straight tuned circuit) between the aerial and earth terminals of the set; this has the effect of short-circuiting a portion of the aerial energy, so that only a part of it goes through the receiver.

If your set is suffering from detector overloading—and, as I say, a good many sets do suffer from it, even though it may be unsuspected—you will be surprised at the improvement you get in the quality of the output when you attend to the various points mentioned above. In fact, it is almost worth while going to work to see if your detector is suffering from overloading, even though you may not have had any cause to think of it before.

The Pifco de-Luxe Rotameter

In our review of this useful meter in the December 8th number of POPULAR WIRELESS, the price of adaptors for testing seven- and nine-pin valves should have been 5/- each and not 3/- as mentioned.

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Radio components and accessories advertised in these columns at below list price do not carry manufacturers' guarantee.

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Postal orders, in payment for advertisements, should be made payable to the Amalgamated Press, Ltd., and crossed.

All communications should be addressed to:—Advertisement Department, "Popular Wireless," John Carpenter House, John Carpenter Street, London, E.C.4.

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(Continued at top of next column.)

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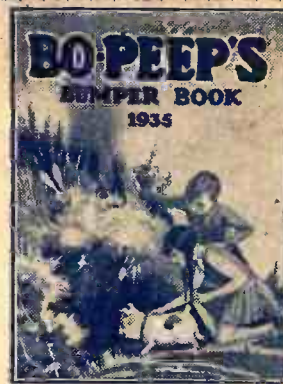
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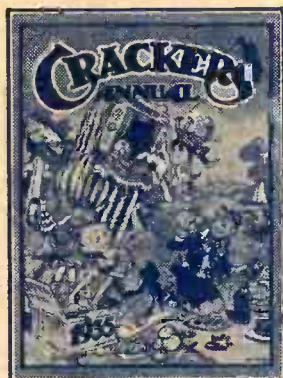
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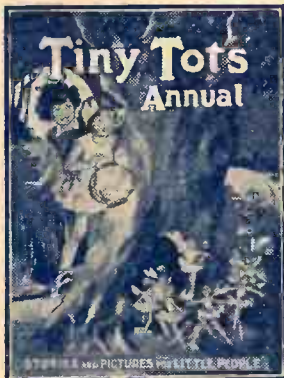
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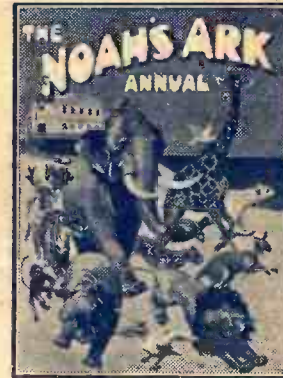
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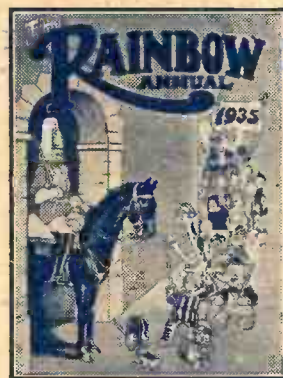
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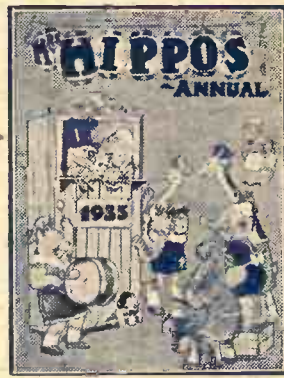
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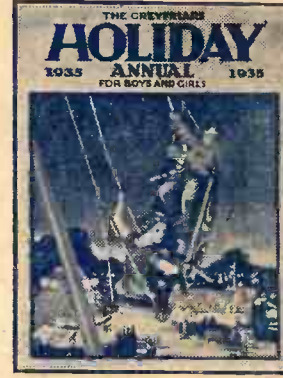
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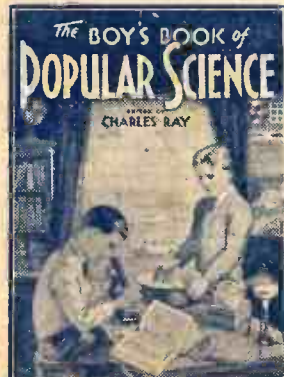
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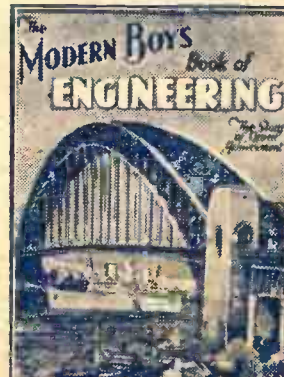
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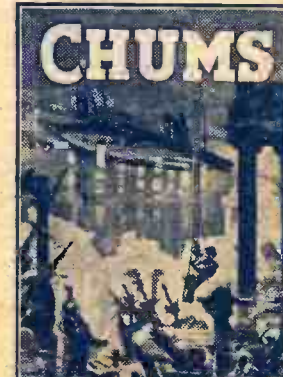
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