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THE "EXTENSER" —By Captain Eckersley (See Page 237)

Popular Wireless

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And Don't Miss These Articles

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By the North Regional Director of the B.B.C.

THE FUN OF BEING FUNNY
By Davy Burnaby.

WHY NOT BROADCAST THE BUDGET?
By Lt.-Com. The Hon. J. M. Kenworthy, R.N., M.P.

THE NAIROBI BROADCAST

Popular Wireless

LARGEST NET SALES

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

JUST LIKE FATHER!
IS THIS A RECORD?
THE "ANTENSIFIER"
ROMANCE

A FAMOUS "SIXPENNY"
THE "LAST WORD"
AFLOAT
OUR ARMY CORPS
"I THINK THE MORE"

RADIO NOTES & NEWS

Just Like Father!

A MAN I know, who has only recently succeeded in reducing to silence a nearby installation of electro-therapy, has now hit another snag. New neighbours had moved in and some nights later my friend was treated to a most exasperating programme of "howls." The neighbours on the other side were ruled out, being old hands at the game. But it was known that the newcomer really was an expert, so that the problem became difficult. One night he peeped out of a window overlooking the other man's dining-room—and there was little Tommy, all alone and going strong with all dials! Pa and Ma were out and apparently are out most evenings! Joy!

Broadcast Piano Lessons.

ONE learns with a nasty clammy feeling creeping over one's senses that some fiend in America has organised broadcast piano lessons for children. The Americans are almost immune from the discomfort which noise can induce in the normal human being, but there is grave danger that the B.B.C. Radio for Schools people will fall in love with the idea. Already our children are being encouraged to rear newts, frogs, beetles, butterflies and spiders, and to grow beans and other luxuriant flora all over the house; also to pick up and deposit in the house geological specimens from the brick fields. But scales on pianos!

Is This a Record?

AS records seem to be the order of the day, what about this one? The Hart people report that they were recently called to examine one of their accumulators in a country house and found that it had been installed in 1903 and had been in constant use ever since. Most of the cells needed no repairs (and there were 54) and another 5 to 7 years of life is predicted for the battery. That's pretty fair service, is it not?

Do We Agree?

MR. H. de A. DONISTHORPE, lecturing to the London and Home Counties Ironmongers' Association, is reported to have dropped the two following bits of advice into the minds of his hearers. First, "It is not advisable for salesmen to know too much about radio." Now, bless my soul!—*why* not? Second, "Don't offer to replace valves too readily." Can it be that the hearts of ironmongers are so soft that they need such advice? Reverting to the first dictum, I should like Mr. Donisthorpe's opinion on whether it is advisable for salesmen to know "too much" about ironmongery!

How Appalling!

MR. WILLIAM BOOSEY, speaking before the dined and wined Musicians' Club, said that an appalling revolution had taken place in the world of music in connection with the inventions that have affected it. His complaint is that, because of radio and gramophones, people seem to be disinclined to make music for themselves. I presume that he bases his inference upon lessened sales of printed music, and I am greatly surprised to gather that less music is being bought. I should have said that music had in every way been stimulated by radio and records and that more people than ever before were learning to sing or play, especially children.

WHY WAS MAISIE GAY?

Miss Maisie Gay, the popular comedienne, is here shown as the comic servant with a portable, in her first talkie "To Oblige a Lady," at the London Alhambra.

Thin Skins at the Seaside.

THE B.B.C. is a benefactor to this country because it provides us with an "alternative" target, the normal one being, as I need hardly point out, the prevailing Government. The B.B.C. simply cannot do right. It broadcasts somebody else's weather report; whereupon Cleethorpes has a grievance because "unsettled conditions generally" was announced and Cleethorpes got ten hours of sunshine but no visitors. Then Fleetwood was pitifully upset because a broadcaster referred to it as a slow place and drew attention to its mud-flats (or banks). Come, come, this "touchiness" won't do! Why not smile and bear these grievous wrongs?

Perpetual Motion "Grammy."

A NUMBER of Friendly Followers with just that twist of humour which dubs them true Arielites have sent in further suggestions for winding up my "grammy," and in particular I like the one which explains how I can wind up the clock which winds up the "grammy," by means of pedalling a "pushbike."

All I now require is a Robot for the pedalling. By the way, the author of this suggestion, who is apparently doubtful whether Ariel is Mr., Mrs., or Miss—(oh, Gertie)—says that it is immaterial how "aerial" is pronounced. Tell that to an "announcer."

Those Long Waves.

N. F. C. (Bournemouth) writes to express his agreement with Mr. Dowding's conclusions as to the desirability of the long waves. In his case they give him something to listen to (Radio Paris) from 2 p.m. to 3 p.m. on Sunday, and something to search for during the splash of Bach after 3 p.m. Further, he has found something to appreciate in Motala, Kalundborg, Oslo, Zeesen, and Eiffel Tower. Mr. Dowding thanks N. F. C. "Ses we!"

As to the Scotch jokes, my lad, if I did not know quite well that the Scots love them I should not rub them in, for the Scots are a fine race, and the Empire would not be what it is but for them.

(Continued on next page.)

RADIO NOTES AND NEWS

(Continued from previous page.)

The "Antensifier."

NEW YORK reports that the R.C.A.—Victor Company has brought out a simplified aerial system of new design which will serve the radio receivers in an entire building, up to as many as 200, regardless of their type or of what stations they are tuned to. A device, called the "Antensifier," which seems to be a form of amplifier, is connected to the specially-designed aerial and also to the lighting supply, from whence a cable conveys radio-frequency energy to wall-plates in the various rooms.

The S.A.R.R.L. Lands a Big One.

SOMEWHAT colloquially expressed, perhaps, but well meant. The Radio Society of Great Britain tells me that on April 4th the South African Radio Relay League held their Annual Conference in Cape Town and that delegates from all parts of South Africa attended. The League is to be congratulated upon the fact that His Excellency the Governor-General accepted the Presidency for the ensuing year, and presided at the opening of the Conference. I understand that the League embraces the amateurs of S. Africa, Kenya, Uganda and Tanganyika.

The Valve-of-All Work.

FLEMING, Edison, De Forest (I stick 'em all in to save correspondence!) little dreamed of the possibilities of the so-called valve. It is astonishing how more and more it is being used in industry. I find that, aside from purely radio work, it is applied to surgery, paper-making, the manufacture of glass, wire, steel, cigars, chemicals and tinned goods. Besides all that, it is used in the measurement of sound and light, and is even made to detect the mistakes of yeast-cake wrapping machines! I wish it could prophesy the "bloomers" of our office-boy! I have to do the detecting of those.

The "Sport" of Kings.

TO-NIGHT I learn of the abdication of King Alphonso, though by the time these lines are printed he may be back again in his fine Madrid palace. Who knows—where Spaniards are concerned? I was hovering within earshot when, in 1911, he opened the Madrid radio station.

A genial, plucky man, if ever there was one! I cannot yet believe that the Spanish people have torn him from their hearts and I firmly believe that the majority of Spaniards are Monarchists and "Alphonsists" still. We shall see! Alphonso is a "sport," and if he chooses to live here with his English wife, *salud* to him and her!

Romance.

PASSING by Swan and Edgar's last week I had the extraordinary good luck to run into a man who I last saw eating chocolates, disconsolately, on a public seat in Shanghai, in 1911. This chap had fallen in love with an (alleged) beauteous maiden on some ship, but had funked the formal proposal. She was bound for Australia, where her parents planned for her a marriage with the wrong bloke. He, then, desired mightily to propose.

But she was, he thought, beyond his reach. "Give me thirty bob," I said, "and I will get her for you, alive or translated." He emptied his wallet, and I pulled the radio strings. Boys! he clicked! And last week he told me that he had her safe in Surrey, and three youug 'uns. Isn't that lovely? Read this to your wives! Radio again!

A Famous "Sixpenny."

THAT bright sixpennyworth of up-to-date radio reading, known in all really civilised parts as the "Wireless Constructor," is now queen of the May. It contains just that magic mixture of technical, topical and popular material to suit most moods and requirements. Make the "Plus-Stage" Two or the "Extenser" Three! Visit Mühlacker, from which you hear so much! Read all about the new "Kilotrap" coils and a new range of valves! This is the very magazine to make life worth living while you wait for "Modern Wireless" to appear.

SHORT WAVES.

EASY.

A writer complains that he can't get what he wants on the wireless. I can, just by switching off.'—"Sunday Pictorial."

* * *

"Although no great lover of music, my dog tolerates the wireless programmes and makes no complaint about them, whether they are coming through at full strength or faintly," we read in the "Liverpool Post and Mercury."

The B.B.C. should be highly gratified by this unsolicited testimonial.

* * *

SOME AMERICAN RADIO TERMS EXPLAINED.

"On the Nose"—being on time at the close of a programme.

"Woof"—a signal to start the programme or check the time.

"Soup"—electric current fed to the aerial.

"Hop"—power supplied to microphones. Thanks, we prefer English!

* * *

A pin dropped in the studio of the N.B.C. was heard all over the Continent, we are told, like "the detonation of explosives."

And next, perhaps, there will be a lark singing through a megaphone.—"The Observer."

* * *

The "Glasgow" News tells a good story of two radio experts who were demonstrating a portable set to an old farmer and his wife. It was a cold day and although there was a roaring fire the door was left wide open. In desperation the visitors donned their overcoats, and the farmer, noticing this, said:

"Ah, weel, Jessie, just shut the door, and we'll stop it."

He then explained to the amazed demonstrators that: "We thocht that wi' the door open the waves wid get a better chance o' getting in."

* * *

MY WIRELESS NOTES.

I read somewhere the other day that the B.B.C. have 1,000 artists on their vaudeville lists.

I wonder what they do with the other 999!—"The People."

The I.S.W.R.L.

MR. A. MANN tells me that the International Short Wave Radio League, 106, Lord Street, Southport, is the only S.W. league with European headquarters. I have had a number of inquiries about it recently and I hope that the membership has been increased thereby. I have twelve pages in hand from Mr. Mann, and will tell you all the extra nice bits as soon as I have had a day off in order to digest his multitudinous but welcome titbits.

The "Last Word" Afloat.

WHEN I first became professionally associated with radio the average ship equipment was housed in a small cabin and consisted mainly of a 12-inch induction coil, a few Leyden jars and a "coherer" receiver. The progress which has been made since then is exemplified by the wonderful installation which Marconi's have placed aboard the Empress of Britain, which is undergoing her trials. It is the most complete equipment ever installed in any ship.

Everything in Radio.

FOUR large cabins house apparatus for telegraph work on long and short waves by means of two transmitters, each of 2 kw. power; a short-wave telephony installation for communication all over the world, direction-finding apparatus and receivers for broadcasting. By means of a repeater plant entertainment can be provided in all parts of the ship. Emergency and lifeboat equipment are fully provided for and comply with all national regulations. Considering how reluctant were many shipowners years ago to look at radio it may be said truly that radio has come into its kingdom.

Our Army Corps.

WE receive a great many letters from men of H.M.'s Forces and appreciate them very highly, more especially because the majority of the writers are engaged in radio work and know "what's wot." G. B. B. (Devonport), a soldier, bandsman and "fan," writes to say that since 1924 he has made seventeen sets to "P.W." designs, of which the "Magic" Four was the one which pleased him most. Less than four miles from Plymouth he can receive the National on 261 metres without interference from his "local." G. B. B. would be delighted to demonstrate his "Magic" to any Plymouth reader. Apply, G. B. Bullen, "Band," Norfolk Regiment, South Raglan Barracks, Devonport.

Man-made Interference.

MUCH publicity has been accorded to the unhappy Berlin barber who was summoned for "jamming" a listener with an electric hair-drying apparatus. He escaped with "costs" against him, but was warned that if he repeats the offence he will be cast into the deepest dungeon below the castle moat. This is awful! Have you ever stroked a cat backwards in frosty weather and seen the sparks? Well, you had better not risk it again!

"I Think the More."

THE staff of the Midland Regional Children's Hour has been augmented by a critic in the person of a pink-and-grey parrot, who sits and leers in silence at the efforts of the entertainers. The blink of his wise eye, equivalent to the critical sniff of a human, is said to be unnerving the singers. This arrogant attitude is aggravated by the fact that Polly has hitherto refused to do its share of the work, though it would probably say in mitigation, "I think the more."

ARIEL.

WHY NOT BROADCAST THE BUDGET?

by Lt. Commander the Hon J.M. KENWORTHY R.N., M.P.

In view of the tremendous interest in the Budget speech and its vital national importance, our notable contributor's plea for the broadcasting of this great event in future years will, we believe, be endorsed by most of our readers.

THIS year's Budget, perhaps the last that Mr. Snowden will introduce, was of far more than usual interest. It will affect every man, woman and child in Britain to an exceptional degree.

Its secrets were not disclosed until after the Stock Exchange closing-hour; and until Mr. Snowden had finished his momentous pronouncement were known only to a handful of men.

I submit that there is a very strong case for the Budget statement to be broadcast.

There may be several views as to the desirability of broadcasting any part of Parliament's proceedings; but if any of the speeches are ever to be heard by the millions of listeners in the country, surely the annual review of the country's finances and the new taxation proposals are the most suitable.

Old-Fashioned Vetos.

I have never understood why the opposition to broadcasting important Parliamentary debates has been allowed to triumph heretofore. It is an open secret that the B.B.C. has, for some years past, been ready and anxious to make the debates heard by a wider public; and there are no technical difficulties in the way. The only explanation I can find is the survival in the House of Commons of the old-fashioned ideas under which, for generations, it was an offence to report the proceedings in the newspapers, and which was only broken through everyone ignoring the veto, rather like the Sunday opening of cinemas to-day; and the same sort of idea that forbade "strangers" to be present in the Chamber.

There is a hoary old tradition that Parliament still sits in secret and some of the old fossils who adorn the benches at Westminster would like to return to this tradition in the strict letter. It is still possible to have the galleries cleared of inoffensive onlookers by raising the cry of "I spy strangers" to the Speaker; and the same influences have, up till now, prevented the listening public from following our proceedings by means of wireless.

Standing Room Only.

Budget night is the most important event of the Parliamentary year. There is never room in the galleries for even a tenth of the people who would like to hear the statement. Members of Parliament themselves have difficulty in finding accommodation on the crowded benches. The Budget secrets are not even disclosed beforehand to the Cabinet as a whole. This is a fact not generally known; but it is true that until the speech is actually delivered, only the Chancellor of the Exchequer, the Prime Minister and the senior Treasury officials know what the fiscal proposals are.

This year the Chancellor was faced with an actual deficit of about £24,000,000; and had to find new money to meet this loss and also to meet new demands in this year's account, making a total of between sixty and eighty millions.

There were all kinds of rumours floating about, such as an increase of the income-tax, an increase in the super-tax, an addition to the death duties, a reimposition of the tax on tea, an increase of the duties on tobacco and cigarettes, an additional levy on petrol, new motor-car taxes; and there were even proposals for taxes on bicycles. While face-powder, lipstick and other cosmetics and aids to beauty were also mentioned!

But these are the kind of rumours that precede every Budget when it is known that there is a heavy deficit; and this was the heaviest deficit, except for the War years, for a century. Somebody has to pay the piper; and the sooner those whose pockets will be searched are informed, the better.

"MIKES" IN THE "LORDS"

The microphones used in connection with the London Naval Conference speeches.

A Record "Audience."

I guarantee that if the necessary arrangements had been made to relay the Budget speech, which commenced at about four o'clock on the afternoon of April 27th, there would have been more people listening than to the finest concerto, the funniest vaudeville, or the most interesting lecture delivered during the whole year.

And I repeat—there are no technical difficulties. When this matter was first mooted, some years ago, I made inquiries through the proper authorities and was informed that the B.B.C. could run the necessary wires and fix the "mike" with forty-eight hours' notice. The Chancellor speaks from a metal-bound dispatch box about eighteen inches high and two feet long, on the clerk's table. It would be perfectly simple to fix up a portable microphone immediately facing him.

No Difficulties At All.

Snowden is not a man who indulges in histrionics; he never waves his arms as Lloyd George does, or thumps the dispatch box as Gladstone used to do, but delivers a business-like statement addressed to those sitting immediately opposite him—his political enemies. I am sure so cool a hand and so experienced a politician as Snowden would not be inconvenienced by speaking straight into the microphone instead; and his

(*Continued on next page.*)

WHY NOT BROADCAST THE BUDGET?

(*Continued from previous page.*)

address would have lost nothing of interest for the assembled company.

What was the alternative?

The speech was given too late for the evening editions of the papers; there was an inadequate summary by the B.B.C. announcers over the wireless at night, and most of us had to wait till the next morning to read the worst in the newspapers.

Removing the Sting.

My friend, Mr. Wickham Steid, gave an interesting "eye-witnesses" account on "How the House Received the Budget," but it would have been an added interest, if not a pleasure, which would have taken some of the sting out of the undoubted bad news for the taxpayer, if the silvery voice of the Chancellor of the Exchequer

OUR FATE IS IN YOUR HANDS!

The Chancellor of the Exchequer, who can tax our "bacca" or increase our income tax, just as much as he thinks we can stand. Wouldn't you like to hear over the "mike" the very first news of such things?

himself had been heard through the ether. True, he gave a talk himself the *next* night. But the news value had gone and it was not the same thing!

Other Speeches Too.

The case for broadcasting the Budget speech is undoubtedly the strongest of all; though I personally, and I believe my views are shared by most of the younger Members of Parliament, would like all the more important debates to be broadcast. Certainly the King's Speech at the opening of the new Session should be so transmitted far and wide. Important debates on India and foreign policy should be made known in the same way.

The fact of the matter is that the older generation of politicians, and some of the permanent officials, have not yet realised that wireless has "arrived" as a great new means of getting the news across to the mass of the people; nor do they quite appreciate the fact that the listeners who support the B.B.C., and that the taxpayers as a body who support Parliament, are very much the same people.

Is This the Reason?

I happen to know that there is a demand for such events as the Budget statement to be broadcast; and in this matter the wishes of the public should have first place. There is a certain school of politician who is always declaiming that the people of the country do not shoulder their responsibilities and are indifferent to the series of crises through which we seem to live, and that the electors don't take enough interest in public affairs; and yet these same old fogies, for they are of much the same persuasion, hold up their hands in horror at any idea of making the proceedings of Parliament better known to the voters generally.

I have always suspected that they are nervous lest some of their inanities might reach the ears of the deluded electors who sent them to Parliament; and that they think secrecy the better part of valour! Newspaper reporters are kind, but the "mike" is a candid friend.

But these considerations don't apply to Snowden; and as he is the principal master of our financial destinies, the least we could expect was to hear his dulcet tones telling us how our pockets were to be searched, and what we shall have to go short of this year in order to keep the country going.

HERE AND THERE

A representative selection from "P.W.'s" ever-growing postbag.

"TWISTED SETS."

The Editor, POPULAR WIRELESS.

Dear Sir,—I was rather interested in Mr. Baxter's remarks, "Twisted Sets," as each one I have made I have had to alter, and fortunately successfully.

It has helped me to understand (apart from standardising) his remark, "reading a letter or page from left to right," but I believe I'm correct when I state, "all display men dress a window with the focus of the eye right to left." Try it, and see if the eye doesn't naturally turn to the right of a window.

My chief complaint, apart from reading left to right, is, all terminals are placed at the back. It is tidy, I admit, but I always alter four, namely, aerial and earth and loud speaker, and put on panel.

My reason for altering design "right to left," each set I have made, both for friends and my own, is the aerial and earth have been nearest to the right side of set. If made to design, I should need to carry aerial and earth across the front of set if terminals were on panel as at present, or cross over at the back of set, which also applies to loud speaker; in each case speaker being to the left of set.

Still, I get there, and am still pleased with the "Titan" Three, although I am now ready for the "Comet."

Thanking you for POPULAR WIRELESS.

Yours faithfully,
"DEVON."

Exeter.

THE "COMET" THREE.

The Editor, POPULAR WIRELESS.

Dear Sir,—It is exactly a year since I became interested in wireless, and, having read your weekly continually for that period, would like to say that, in my opinion, it is the ideal journal by which a general and sound knowledge of this absorbing hobby may be acquired.

My first conquest was the "C.T." One, and I have advanced from this to a four-valve receiver incorporating your coils.

This set is the "Comet," with a plain triode H.F. valve in advance of the detector. Although this is not a neutralised circuit, it is amazingly stable, and I am certain that the complete set's performance is as good, if not better, than most S.G. threes on the market at present.

As I have not had the opportunity to use coils designed by you and your contemporaries, I cannot compare their respective qualities with your latest triumph, but this I can say, that the high efficiency of the wave-change scheme and the quality of this coil in action leave nothing to be desired.

Regarding the long-wave coupling condenser, the value of the one I am using is .003 mfd., and while I apologise for this departure from your specification, the result is so gratifying that it will remain in circuit.

There is a whole lot more I could say concerning your "P.W." (complimentary), but will finish by asking you to give my best wishes and thanks to "Ariel" and Capt. P. Eckersley, if they will accept them from an eighteen-year-old enthusiast.

Thanking you for your services.

Yours faithfully,
THOMAS P. WILLIAMS.

Upton Park, E.13.

ARTIFICIAL AERIAL TRANSMITTERS.

The Editor, POPULAR WIRELESS.

Dear Sir,—In reference to a letter appearing in the April 11th copy, "All On a Two-Valver," by Eric Taylor and James Watson.

I should like to point out that their list of short-wave British amateurs is very much in error. They log as heard 2 B H M and 2 A C K. These are "Artificial Aerial Transmitters," and would not be heard, except over very short distances (yards). They are situated at Birmingham and Cardiff, a considerable distance from Westcliff. I suggest they heard these stations being called on for reception reports, and certainly not transmitting (at so great a distance). I ask these keen fellows to review their log and correct, I hope, as they are likely to cause serious trouble between the "A.A." stations concerned and the Postmaster-General.

Yours faithfully,
LESLIE COOPER (2 A P G).

P.S.—I have been a regular reader of POPULAR WIRELESS for many years, and shall continue. My own DX Q.S.L. cards to arrive this week are: V K 7 C H Tasmania, V E 3 B M Canada, C M 2 S H Cuba, W 1 W V, W 2 B I C, W 7 B A, W 9 B E P America. These are only a very few, and it is on experience gained in the early days from POPULAR WIRELESS and associated papers.

130, Walton Road,
East Molesey, Surrey.

[EDITORIAL NOTE.—In fairness to the writers of the letter concerned, we should like to say that their letter, though published in April, was written months before that, so it is possible that call-sign changes have taken place in the interval.]

WHAT I THINK of TELEVISION

BY John Scott-Taggart, M.C., A.M.I.E.E., F.Inst.P.

LAST week I described how we could transmit simple pictures and letters by having a transmitting panel with lots of press-buttons connected by separate pairs of wires to similarly arranged lamps on a receiving panel. I concluded by saying that if we very rapidly pressed in succession the buttons necessary for forming a T, the letter T would flash up momentarily on the receiving panel.

Each press-button is depressed only for a moment, so we might merely expect a series of isolated flashes at the receiver which would mean nothing. This is exactly what would happen if the press-buttons were pressed in turn *slowly*. But if the process is done very rapidly, we see the complete letter T for an instant. Why?

Retained by the "Retina."

The reason is this. The human eye consists of a lens arranged in front of a screen which includes the dark centre part of the eye and which is right at the back.

On this screen, or "retina" as it is called, is thrown an "image" or miniature picture of what we see, just as an "image" of a landscape or person is thrown on the ground-glass focussing screen of a camera.

(Incidentally, the "image" on the retina is upside down, but the nerve connections to the brain prevent us seeing objects inverted.)

The retina is composed of millions of

This is the fourth article of an exclusive series in which the author is supplementing his personal opinions of the subject by one of the best and most readable explanations of the technique of television that has ever been written.

extremely small hexagonal cells, each of which is connected by a nerve filament or thread to the brain. These cells are supplied with a constantly changing liquid known as the "visual purple." It is the light falling on these cells which produces sight.

Now a peculiar property of the retina is that it "retains" an image of what it sees for about one-tenth of a second after the original object is removed. If you hold a picture before your eyes and then suddenly remove it, you will continue to see that picture for a tenth of a second.

This phenomenon is known as *visual retentivity* or *persistence of vision*. It is quite different from remembering the picture in the ordinary sense of remembering. It is quite automatic.

"Optical Illusions."

There are innumerable examples of persistence of vision in every-day life. If we take a string and attach a light of some sort at the end and swing it round vigorously we will see a circle of light and not a spot at all. This is a favourite example amongst television authors.

Some tie a glowing cigarette to the end of the string. Others prefer a cigar or a glowing match-end. Still another suggests that merely the end of the string should glow. Personally, I like to be really modern and swing an electric lamp round on a length of twin flex!

Other examples are: the blending of colours on a spinning top, the absence of flicker on an electric lamp worked off A.C., and, most common of all, the cinematograph film, which consists of a succession of sixteen or twenty-four (in talkies) still pictures per second. We notice no flicker because we are still seeing the last picture when the new one comes along.

Now this persistence of vision is a vital factor in modern methods of television of even fixed objects. In the case of our primitive apparatus we see a T flash on the receiver panel because all the individual lamps have flashed up within a tenth of a second.

Even if we assume, as I am doing, that a lamp goes out immediately the press-button is released, we still will see that lamp for a tenth of a second.

We are therefore still *seeing* the first lamp, and, of course, all the others, when the last lamp lights up, even though the last lamp is the only one actually alight at that moment. The effect is therefore similar to that we would obtain by momentarily pressing all the T buttons at once.

This persistence of vision is so important to understand that I have thought of a method of showing it very clearly.

A Practical Illustration.

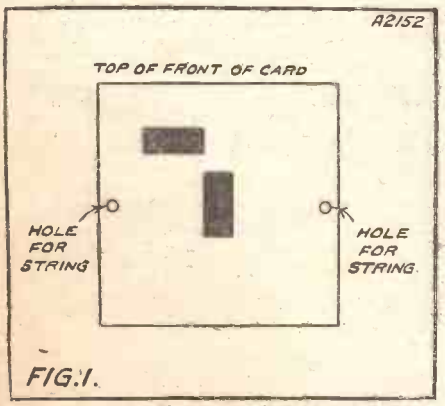
Cut out the square in Fig. 1 and paste it on a piece of cardboard the same size.

Cut out the square of Fig. 2 and paste on the other side of the card. Two holes are now made in the card and a piece of string is fixed to each. You now hold the two ends of the string as in Fig. 3 and get someone to turn the card round several times and then release it.

It will spin round and you will see the letter T. What you really see is first the front of the card which shows parts of the T only; then the card spins round and you

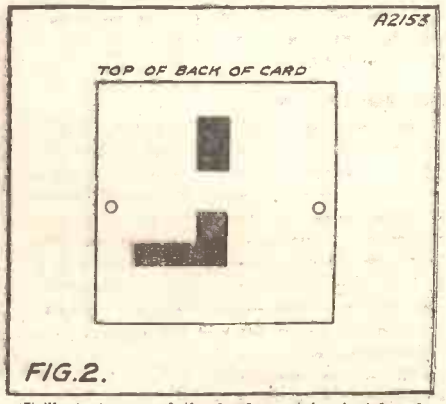
(*Continued on next page.*)

NOW TRY THIS—



The first stage in an intriguing little experiment described by Mr. Scott-Taggart.

IT'S QUITE STRIKING



It illustrates one of the fundamental principles of television.

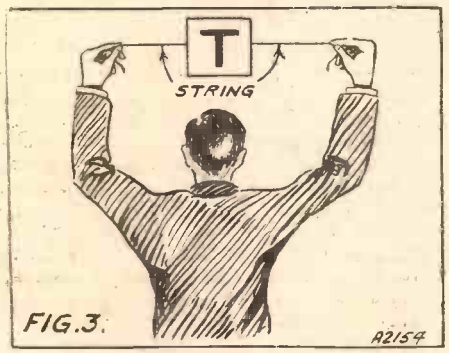
WHAT I THINK OF TELEVISION

(Continued from previous page.)

see the back of the card which will appear like Fig. 2 upside down. (This effect is obtained by looking at Fig. 2 with this page turned upside down.) Fig. 2, of course, has on it the bits of the T left out of Fig. 1. The eyes are still seeing the front of the card when the back comes round and you see the missing bits fitted into their right place. The whole T is thus completed.

You can cut the T up into as many bits as you like, but provided you see them all

WHAT YOU'LL SEE



Due to persistence of vision the letter "T" will appear as the card rotates.

within a tenth of a second you will see a proper complete T. So in the case of our simple "television" gear we can build up a T by successively sending its "bits" or component parts very rapidly.

Now the elementary "television" gear No. 1, as we shall call it, does not "see" at all. The receiver is all right, but at the sending end we need a human operator. If we use a wooden stencil, as previously suggested, we are getting nearer to an automatic system, but what we really want are push-buttons which "press themselves" when light falls on them. We want automatic electric "eyes" instead of ordinary push-buttons, and science has given us these in the form of *selenium cells.*

The "Electric Eye."

Selenium is a rare metal which is a very bad conductor of electricity. Its high resistance, however, drops almost at once to a low value if a light is shone on to the selenium. It is "light-sensitive."

A selenium cell is simply a specially sensitive arrangement of selenium. If we use a selenium cell in place of each press-button of our apparatus No. 1, we can imagine that when no light shone on to the selenium cell it would not pass enough current to light the corresponding lamp in the receiver.

But the moment a bright light shone on to the selenium cell, the latter would become highly conductive and enough current would flow from the flash-lamp battery to light the lamp.

The complete arrangement is as follows: An electric lamp is hung in front of a transmitter panel, which is covered with rows of little selenium cells, each of which is connected by a couple of wires to a little electric lamp in a corresponding position on the receiver panel; a flashlamp battery is included in each circuit. All the insulated wires are bound together to form a cable which goes to the next room or wherever the receiver is.

Lighting the Lamps.

If no stencil is placed between the incandescent lamp and the transmitter panel, all the selenium cells receive light from the lamp, become conductive, and so all the little lamps at the receiver light up. If now we put a cardboard T between the incandescent lamp and the panel, a shadow is thrown on some of the selenium cells and consequently they do not conduct and their corresponding little lamps in the receiver do not light up.

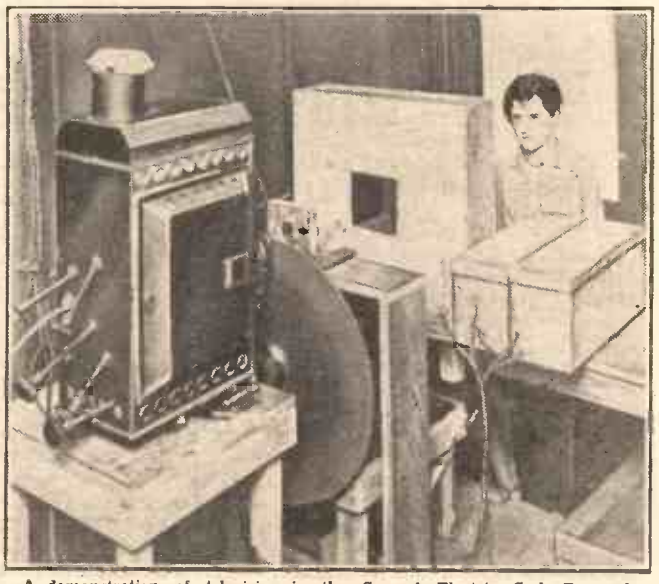
We then see the T as a black shadow on the receiver. Rough shadows of any objects can be sent in this way. If desired, a big sheet of cardboard with the T cut out could be placed before the transmitter. In this case, the T would not be a shadow, but would illuminate only the selenium cells in the T of light thrown on the panel. The receiver panel would be dark, except for the T composed of lighted lamps.

This television gear, has frequently been actually used, but since the selenium does not actually pass enough current to light the little receiver lamps, relay switches are used to operate the lamp. A shadow which moved before the transmitter would likewise move on the receiver panel, so we have a very rough form of "television." In this system, of course, all the selenium cells work simultaneously and not one after the other.

ONE OF THE PIONEERS

The American television worker, Francis Jenkins, and one of his simplest types of receiver.

IN AMERICA—THREE YEARS AGO



A demonstration of television in the General Electric Co.'s Research Laboratory at Schenectady, New York.

THE "CLEAR-CUT" IN INDIA

The Editor, POPULAR WIRELESS.

Sir,—Just to add my voice to the chorus of praise you have already received about your "Clear-Cut" Cone. I have fitted mine to a Loewe unit and find a marvellous improvement in strength and tone, both high and low. Indeed, it lives up to all you claim for it, and was quite a revelation to me.

You may also be interested to know my present set is your "Sharp-Tune" Two, minus the selectivity condenser but plus an additional transformer coupled L.F. For its simple and economic construction the set's behaviour is really remarkable. Besides the medium-wave Indian stations I have received Rome and other European stations on the broadcast wavelengths on all occasions when conditions were favourable for their reception. Short-wavers I have received with this set include: P. C. J., Rome, Saigon, Nairobi, Marconi, Bucharest, Bangkok, and a number of unidentified stations. I heard both ends of the Belginland and London, New York or Sydney conversations, and just last night I heard Bandoeng, Java, calling Los Angeles. I have received the St. Patrick's Day celebrations noticed in the "P.W." for March 14th, and have taken notes of the speech, which I heard quite distinctly. It was on about 25 metres, but I don't know from what station I received it. At the end of it somebody called America and queried about the reception, but was told that the station had closed.

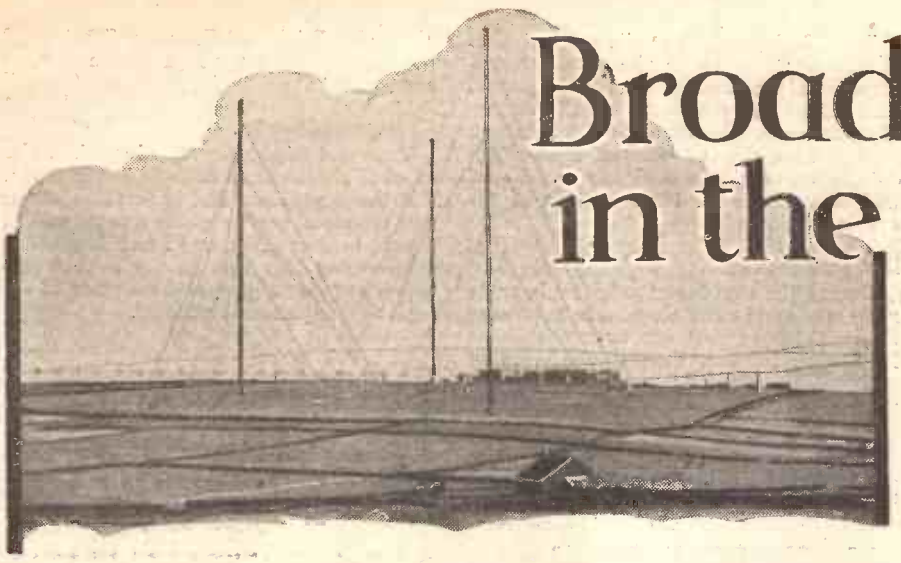
I now intend making your "Globe Trotter," and so more of it later.

Our big problem is the current supply, as the majority of towns have no electric supply, which puts out of question mains units or accumulator charging. Dry batteries seem to be the next best affair, but they are notorious in their behaviour in the tropics.

Wishing every success to the "P.W."

Yours truly,

Mount Road, Madras. T. S. RAJA.



Broadcasting in the North

by

E.C.D. LIVEING
NORTH REGIONAL DIRECTOR OF THE B.B.C.

THE application of the Regional Scheme to the north of England is now nearing completion, and within a short space of time the second wave-length (301·5 m.) of the Moorside Edge Station will be in regular service. Listeners in the north and further afield will then have the opportunity of judging the value of alternative programmes and, in particular, the programme standard of the North Regional wave-length which, until it is freed of carrying a very large percentage of national material, cannot start to pursue its own distinctive path.

During the last few weeks much has been written about the technical details and possibilities of the station. It is now time to estimate the programme possibilities of the North Regional wave-length, and to describe the Regional organisation which has been created in the north.

These articles will, perhaps, be of particular interest to northern readers of "P.W.," but there will be many readers in the south of England and elsewhere who may care to know something of a scheme that is to give expression to the talent and activities of the most populous region in the whole country.

A brief account of the organisation behind this northern English service will help to show the scope of activities which the B.B.C. is planning. The main organisation and programme staff is centred at the North Regional offices and studios in Broadcasting House, Manchester.

Plenty of Studio Broadcasts.

The sub-centres at Newcastle (which is retaining its transmitter, but which will work very largely in liaison with the North Region) and at Leeds are also equipped with studios and offices, and are linked by permanent land-line with Manchester, through the Control Room at which the lines continue out to Moorside Edge by a specially constructed underground cable.

The three centres possess six studios in all, so that it will be realised that full provision is being made for studio-produced programmes.

But a region like the north cannot be adequately tapped simply through local studios, and a very large proportion of the work at the three centres will continue to consist of keeping in touch with northern life, of negotiations for the many important "O.B.'s" available, of auditions to promising artistes, and so forth.

This is the first of two exclusive articles backed by a real knowledge of the subject and written specially for "P.W." It tells you many interesting things about the North Regional Scheme, and how the demand for even brighter and better programmes will be met.

Mr. Marshall, the Station Director at Newcastle, has established a strong position in the Tyneside area, and Mr. Fox, the Leeds' representative, is closely in touch with affairs in the West Riding of Yorkshire. In addition, there is a mobile force of musical, dramatic and educational specialists at Manchester constantly moving round the north, and a "flying squad" of O.B. engineers.

Six Weeks Ahead.

The "Programme Board" meets weekly at the North Regional offices to discuss the particular week's programmes (and talks six weeks in advance), and any other matters affecting programmes directly or indirectly. All senior officials in Manchester attend this, and the Newcastle Station Director and Leeds representative are frequently present.

At these gatherings we pool our ideas and our information about future events, and it would probably astonish members of the public if they could listen to the variety of matters discussed—football commentaries, an international golfing match, cathedral services, theatre O.B.'s, a series of talks by prominent leaders of northern industry, orchestral concerts, traditional plays, civic weeks, and trade fairs.

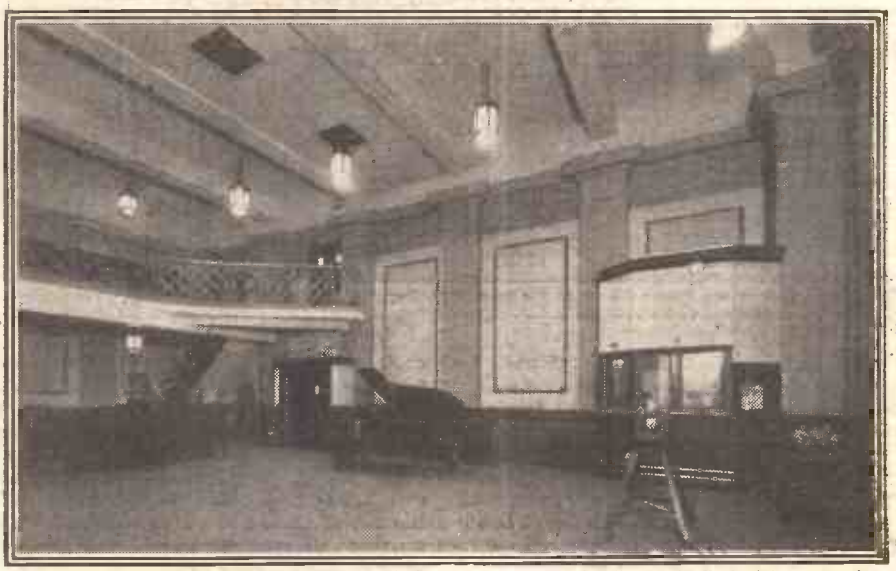
Origin of Programmes.

Mention of many such matters is made in the course of the discussions, and the whole life of the north, week by week, is brought under review and sifted. For it is at these meetings that a more or less fixed decision is made to go ahead with negotiations and arrangements, and the jigsaw puzzle of programmes begins to take shape.

It may surprise readers that I am writing in the present tense about a scheme of things which has not finally materialised. But in actual fact the change-over from local station broadcasting to co-ordination

(Continued on next page.)

WHERE MANCHESTER MAKES RADIO MUSIC



This is the Main Studio of the Manchester Station, and no doubt it will eventually be taken over by "Moorside Edge." Note the Announcer's Observation Cabinet, also the Audience Gallery on the left.

BROADCASTING IN THE NORTH

(Continued from previous page.)

of Regional programmes in the north took place over two years ago.

The eight transmitters have been grouped together and, though a considerable portion of the national programmes has been broadcast through their wave-lengths, all these transmitters have carried a large amount of material of a Regional origin.

It is probable that both the Regional and National wave-lengths will be in operation early in June. Prediction of the exact times of the eventual Regional service, it is a little early to give. But, generally speaking, the North Regional will transmit week-day programmes of light music from noon to three o'clock.

It will open up again for the Regional Children's Hour, which will continue to be relayed from the Manchester Studios and which already has a Radio Circle membership of approximately twelve thousand attached to it. A quarter of an hour's dance music or light music will follow from 6—6.15 p.m., when the first issue of the General News will be given.

From 6.30—10.15 p.m. listeners will be able to settle down to the principal programmes of the evening. The earlier period, from 6.30—7.30 p.m.—will usually consist of light music, performed by the Northern Studio Orchestra or relayed from some outside source. A great variety of material will be available for the remainder of the evening.

Real Northern Touch.

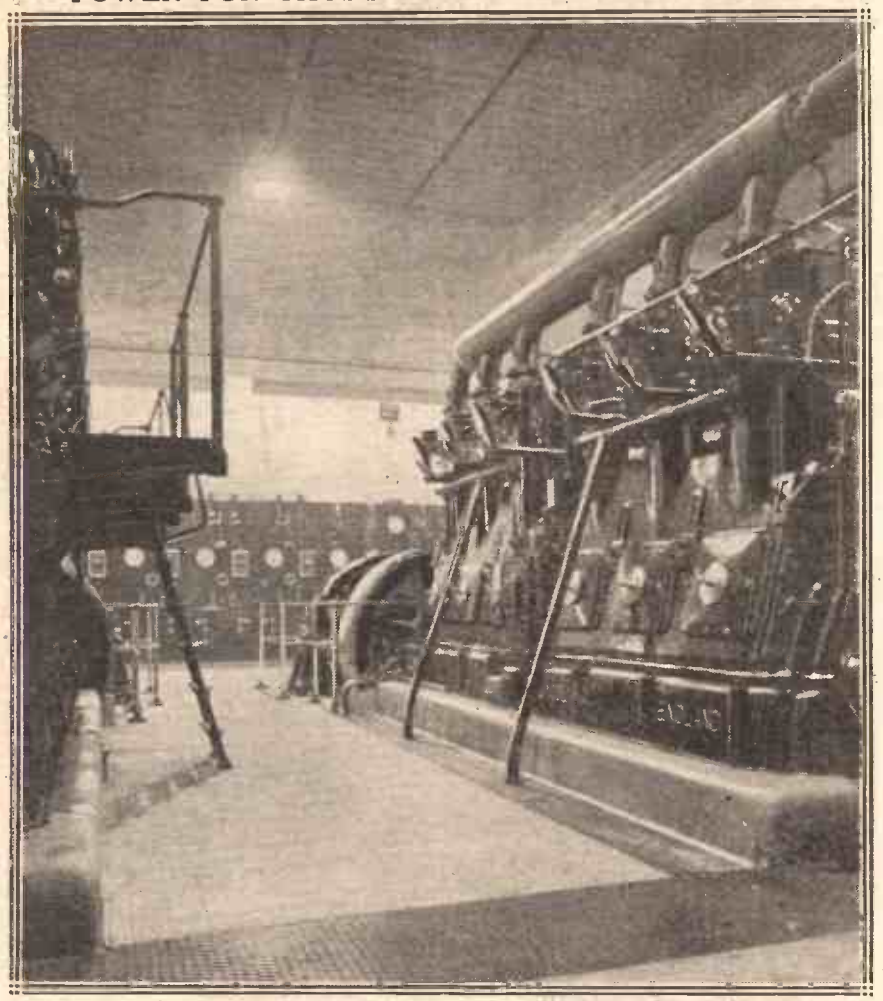
During the summer months we hope to relay music and entertainment from some of the well-known northern resorts, such as Blackpool, Buxton, Scarborough, Whitby and Bridlington. In addition, we are preparing a large number of studio-produced programmes reflecting northern interests; sketches in Yorkshire, Lancashire and Northumbrian dialects, radio plays by northern authors, revues with northern casts, and discussions between prominent citizens on matters affecting life in the north.

There will be a small number of talks on the Regional wave-length, and several of these will be designed to describe topical events. Our microphones will again visit the Isle of Man, and we hope to arrange a number of commentaries and special programmes relating to the Yorkshire and Lancashire cricket matches, the Rydal Sheep-dog Trials and Grasmere Sports, and the more important northern tennis tournaments.

An Important Service.

Time and experience can alone show the effect of the Regional Scheme in the north. But the significance and importance of the new broadcast service which is being offered cannot be over-rated, and I look forward to emphasising this fact in my next article which will give a general description of the region's programme resources.

POWER FOR THOSE NORTHERN PROGRAMMES



This is part of the Power House of the new North Regional Station at Moorside Edge, near Slaithwaite. It shows two of the four 345 B.H.P. Diesel engines, with the main switchboard in the background.

AMONG OUR "THREES"

How our readers are faring with the "Comet" and other popular "P.W." Three-valvers.

THEY COME IN "LIKE LOCALS."

The Editor, POPULAR WIRELESS.

Dear Sir,—It may interest you to know of the results obtained with the "Comet" Three recently made up from your specification.

I have picked up on three evenings 27 stations on a M/C speaker, mostly of equal volume to the locals.

Yours truly,
W. CRAVEN.

Southend, Essex.

FROM THE WHOLE FAMILY.

The Editor, POPULAR WIRELESS.

Dear Sirs,—Herewith another instalment of praise for the wonderful "Comet" Three. It is "IT." We are having splendid entertainment from same via an "Ormoud unit" fitted to a 2-ft. square baffle, the whole of which will be incorporated, later on, in a suitable cabinet, together with gramo.

Thanking you sincerely for the introduction of such a splendid set.

We are,
Yours, etc.,
W. C. PLUME AND FAMILY.

Bromley, Kent.

TWO "P.W." "THREES."

The Editor, POPULAR WIRELESS.

Dear Sir,—I have been a reader of your paper now for some time, and the first set I built was the "Everybody's" Three, of November, 1928, which has been giving me excellent service ever since, and is still doing so. A few weeks ago I built the "European" Three for a friend who knows nothing whatever about wireless, and I chose that one because after reading the article it looked so easy to handle, and I must say that it has acted up to all you say, the selectivity is splendid; the stations coming in all round the dial, one after another.

Wishing your paper every success.

Yours faithfully,
C. C. LILLYWHITE.

Worthing.

THE "THREE-COIL" THREE.

The Editor, POPULAR WIRELESS.

Dear Sir,—A word of praise for the "Three-Coil" Three. It is by far the best I have constructed yet, having progressed from the "Unidyne" down to the above (in fact, I still have the valve I used in the circuit which anyone can have, free, if they can find a use for it).

Referring to the "Three-Coil" Three it gave no selectivity at first until I found I had the 60Ω anode coil connected the wrong way round, but upon correcting this it is now O.K.

I append a few of the stations I have been able to receive at various loud-speaker strengths:

Hulzen, Radio Paris, Kœnigswusterhausen, Daventry, Eiffel Tower, Motala.

Munich, Vienna, 5 G B, Langenberg, Rome, Stockholm, Madrid, Dublin, Glasgow, Frankfurt, Toulouse, Algiers, Stuttgart, London Regional, Barcelona, Strasbourg, Plymouth (local), Brussels No. 2, Turin, London National, Belfast, Cork, and several others unidentified.

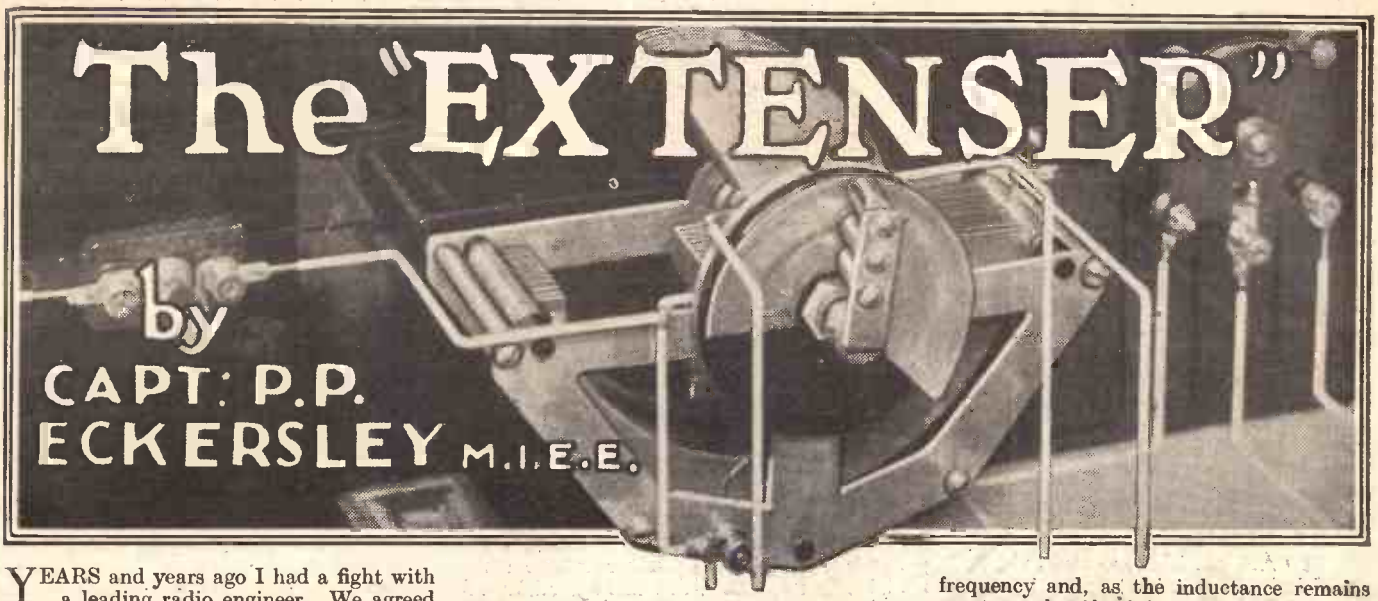
On some of the stations I have to detune as volume is too much. The only alterations I have made to this set are to add an output filter and to put in an anti-motor-boating device which makes the set pleasant to operate.

Please accept my warmest praise for a splendid circuit.

Yours truly,
F. E. HOLMES.

Plymouth.

The "EXTENSER"



by CAPT. P. P. ECKERSLEY M.I.E.E.

Read what one of the world's greatest radio engineers has to say about the wonderful new "Extenser" system.

YEARS and years ago I had a fight with a leading radio engineer. We agreed that it was necessary to supplement existing transmission technique by a high-powered station, but we did not agree upon a wave-length; he suggested 450 or so metres, I suggested something around 2,000.

He argued that it was disastrous to reception technique to make a break in the gamut of wave-lengths to be covered by the receiver; I argued it was disastrous not to cover the whole area of rural England from one station, and that my wave-length would avoid ship jamming.

Inherent Difficulty Banished.

The argument goes on still but, of course, we did establish a long-wave service, and have been followed by many European authorities. I think, in spite of the obvious receiver design difficulties in covering a double wave-range, that I was right, having always maintained that reception technique inevitably adapts itself to transmission conditions.

The long wave has the enormous advantage in covering a wider territory than the medium wave, and it is better to face reception difficulties than to have nothing worth while to receive. The Americans won't agree to long waves; the Europeans are pressing for more and more long waves. The receiver designers govern transmission technique in America; they do not in Europe.

But now I feel myself doubly right because the staff of POPULAR WIRELESS have practically banished the difficulty inherent in the design of a simple double-wave-range receiver. Like all good ideas, the scheme is simple in essence and simple to carry out.

The long/short-wave switch is carried on the arm of the tuning dial and comes into operation so that one 180° of the condenser dial covers one wave-range, and the other 180° of the condenser dial covers the other wave-range.

Its Use Inevitable.

I think any sensible designer must take up this invention eventually, because it makes operation that much simpler. It is always a mistake to confuse the user unnecessarily, and if you have to say "Toulouse comes in at 24° with the switch on 'short,' but Hilversum comes at 24° with the switch on 'long,' the user says, "Oh yeh," or words to that effect, and wonders why French should be pronounced in Dutch when he is on 24°!

Very few people seem to understand that selectivity varies over the wave-range. Thus the selectivity of a set at 200 metres is less than the selectivity at 500 metres. Most people seem to think that this is because the circuit has a larger condenser at the lower frequency.

As a matter of fact, the selectivity of a circuit is dependent upon the ratio of the quantity the resistance divided by the inductance to the side-band frequency. But the resistance of a coil increases with frequency and, as the inductance remains constant, the selectivity thus becomes, from what has been said above, less with increasing frequency.

Now I had an idea of building a "tuner" with a number of coils all graded so as to keep their ratio of resistance to inductance as constant as possible over the full wave-range and to switch in suitable coils by the movement of the condenser, and so keep selectivity moderately constant.

CAPT. P. P. E.'S ADVICE

"I advise all those who have an interest in the design of radio receiving sets to make use of the new device," says Capt. Eckersley in the accompanying article.

Adaptable to Existing Sets.

I still think there is something in the idea, but the "Extenser" is far simpler and practically more worth while, at this stage, than my suggestion.

It is hardly my place to go into constructional details; these have been fully covered in, for example, the "Wireless Constructor," but I do back up the contention that the device is absurdly easy to construct and to adapt to existing sets. I advise all those who have an interest in the design of radio receiving sets to make use of the new device.

There is one last point. I foresee the day when one condenser will not cover the whole wave-range. I think it likely that eventually the broadcasters will secure all the wave-lengths between 2,000 and, say, 800 metres. It may not be yet, but it will come I think.

There will be another short-wave band—where it is difficult to say. This will mean three switchings, and it would be amazingly confusing to have to switch long, medium, and short. The "Extenser" principle again applies, and the 360° of the dial could be definitely engraved with the names of stations.

Step Towards the Ideal.

I believe it would be a great advance if the tuning dial were 8 inches in diameter, and had small slots in which to place the names of stations. The idea of the slots would be to change names about if the wave-length plan altered. So long as they stick to definite wave-lengths, we could then have a really fool-proof dial and we could turn to any station we liked.

It is the ideal in the end to have an engraved dial with the actual names of stations printed thereon. The first step towards the ideal has been taken. Congratulations to the designers of the "Extenser" for showing us how to take that step.

THE NAIROBI BROADCAST

All about the recent special broadcast from Kenya Colony to the Mother Country.

By THE EDITOR.

"THIS is 7 L O Nairobi calling Great Britain."

Did you hear this announcement on April 20th, or, if you didn't, did you hear this one:

"Hello, London Newspaper men. Hello, England. Hello, America and Australia. This is C T I A A about to relay the special 'Wireless Constructor' broadcast from Nairobi."

The above announcement was made from 7.30 to 8 p.m., thus giving our associated journal "The Wireless Constructor" some of the best publicity that has ever been broadcast!

C T I A A, of Lisbon, seemed to be calling everybody in creation! and his broadcast was a very great success. If these remarks should catch his eye, we should like to thank him very much indeed for the great help he gave in relaying the Nairobi broadcast.

Very Successful.

As for the actual broadcast itself, we have already cabled our friends who organised the concert in Nairobi on behalf of "The Wireless Constructor," and thanked them very much indeed for what has undoubtedly proved to be a very successful long-distance broadcast. It was a little unfortunate, perhaps, that the introductory remarks made by the manager of 7 L O were rather interfered with. We picked up on our own short-wave set the following:

"I am very glad to open this special broadcast for Britain, which has been arranged on behalf of 'The Wireless Constructor.'"

Then followed a musical item, including "Here's a Health unto His Majesty." Then Mr. A. W. Jenkins came before the microphone, and said: "This is Joe speaking and wishing you many happy returns of the day." Mr. Schultz broadcast: "Good Luck to Martin."

A Mr. Jones had a word or two to say, and he talked of the weather in London, and hoped the B.B.C. were relaying the Nairobi concert; a Mr. Higgins said: "Hello, Elsie," and many other greetings from Kenya residents were picked up.

A talk on "Gorilla Hunting," by Mr. Martin Johnson came next, and afterwards we heard tom-tom dance music.

"Mike Shy" Lions!

It would take too long to go through all the programme, but the last item, which came over extraordinarily well, included the following: "Rule, Britannia," "The British Grenadiers," "God Bless the Prince of Wales," and "God Save the King."

In the concluding announcement the manager of 7 L O regretted that the lions had refused to roar. It appears that they were a little "microphone shy"! Nevertheless, this short-wave broadcast has undoubtedly proved that much can be done, despite interference and static, in picking up short-wave broadcasts from our Colonies; and we are hoping that in the near future we shall be able to announce that arrangements have been made for another African broadcast on even more spectacular lines.

We should be very pleased, on behalf of "The Wireless Constructor," to receive any reports from our readers who were successful in picking up 7 L O or C T I A A. The more details received the more comprehensive shall we be able to make the report which we shall send our friends at 7 L O. They took an infinite amount of trouble to make this broadcast a success, and anything we can do, and which our readers can help us to do, to reciprocate their courtesy, will further establish the friendly relations which this special broadcast has initiated.

"Uncle Arthur" Returns.

Thousands of our readers must have felt a real thrill the other evening when they heard once again the voice of Mr. Arthur Burrows.

"Uncle" Arthur—one will always think of him as "Uncle"—resigned from the B.B.C. in 1925 to take up the position of secretary-general of the International Broadcasting Union at Geneva, and as a result the B.B.C. lost its pioneer announcer and director of programmes, and the listening public an "Uncle" whose personality they had learned to regard with great affection, and whose voice was probably the most pleasant and best-liked in the history of British broadcasting.

Arthur Burrows was publicity manager for the Marconi Company at the time of the formation of the old B.B.C. in 1922. Sir John Reith (then Mr. Reith) was appointed manager of the old B.B.C., and one of the first assistants he engaged was Arthur Burrows. Cecil Lewis and Stanton Jeffreys were also pioneers of those 2 L O days on the top floor of Marconi House.

Old readers will remember that "P.W." had been on sale some six months before broadcasting began in this country, and we sometimes expressed the editorial view that the B.B.C. never would make a start!

When Broadcasting Began.

But we were all impatient in those days—impatient as any parent to hear the new baby give its first squawk!

Well, the opening night was eventually fixed, and Arthur Burrows was the first official announcer to "take the air." He took it—as a duck takes to water; and some of our readers may remember his opening phrase on that memorable night:

"Hello, Everybody, 2 L O calling. You know, this broadcasting is going to be jolly good fun!"

Prophetic words! It was fun—better fun then than it is to-day; and Arthur Burrows did a great deal to make the B.B.C. a real rip-roaring success.

Listening to his voice again the other evening, we are glad to notice that the passing years have not subdued the vitality of his speech or the charm of his diction.

Use For Those Landlines!

His job in Geneva does not allow him to visit England as often as he could wish, but we hope that in future we shall have more frequent opportunities of hearing him broadcast again. Perhaps he will be heard over the new landline international broadcast links he referred to last week!

And if, by any chance, he feels like settling down in this country again—why, we hope the B.B.C. will waste no time in once more securing the services of "Uncle Arthur."

ELECTRICAL TIMING IN NEW ZEALAND

Special all-British electrical timing apparatus that has been taken to New Zealand to time attempts on the World's Land Speed Record. It is stated to be capable of accurate measurements to one-hundredth parts of a second.

THE FUN OF BEING FUNNY

By Davy Burnaby

This is a very amusing and characteristic account by one of the famous Co-optimists, who frequently broadcasts, in which he tells you of the trials and troubles of being funny. All the same, he seems to enjoy it pretty well!

AS Shakespeare remarked in 1880, "Humour is the salt of life, but too much spoils the greens." On second thoughts, perhaps it was Gladstone in 1501, but no matter. The point is that too much of a good thing makes the heart grow fonder of something else.

Practice makes perfect, of course, but the necessity for it is a darned nuisance all the same. People who—oh, dash it, I can't keep that up much longer! So that, ladies and gentlemen, brings us to the end of our talk on proverbs, and we are now going over to hear Davy Burnaby lecture on "The Fun of being Funny," with the accent on the fun.

A "Born" Comedian.

By fun (said he, striving to look profound, and reaching unostentatiously for a dictionary) may be understood merriment, frolicsomeness, frivolity, drollery, and lightheartedness.

The comedian is born with all these attributes in excelsis, and—well, if you could only see me wrestling with this confounded article you wouldn't doubt it for a moment. Wrestling is a frightfully tiring business, too.

I've been at it for several moments now, and believe me or believe me not, when in a minute or two they come to tell me that I'm half an hour overdue at the theatre, I shall be almost too tired to get out of this easy chair or to take my feet off the one in front of me.

I don't dislike broadcasting. In fact, I rather like it. Mike holds no terrors for me, for I have known his family for years, and his grandfather was a personal friend of mine.

Mike's grand-dad, you know, was an old Edison Bell recording phonograph on which I inflicted my early efforts for the benefit of posterity; but posterity needn't worry too much about it. I used to induce my friends to do their darnedest also.

Once again posterity need feel no alarm. Nowadays those records would probably be sublimely humorous, but I can't offer to let you hear them. Unfortunately, my own got broken, and my friends never did have much of a sense of humour.

Making the Most of It!

In the end I took Mike into a cathedral to record the organ music. No modern apparatus has ever done such justice to the bass as he did. True, nothing else came out at all, but what I have always taken to be the diapason was too simply lovely for words.

Poor grandpa Mike! How proud he would be of all the little Mikes about to-day!

Being funny is a serious business—and I don't mean what you mean, either. I'm too sorry for myself to be sorry for the audience.

HERE HE IS!

Davy Burnaby, one of the (Co-)Optimists.

After all, they know it never lasts for long, and a little suffering makes heroes of us all—except the ladies, of course, who would become heroines, unless they're married, when they claim to be that already.

No, the really nasty catch about spontaneous humour on the stage and on the air is that it simply isn't spontaneous at all. Dame Nature gets a nasty jolt in there.

Things just aren't what they seem, that's all. When you hear quips and jests simply bursting from the lips of a comedian, it's a pretty safe bet that he's had the poor old grey matter stirring for weeks and weeks before.

Just think of all the things they don't like you to be funny about before the microphone. Flat feet, cheese, kippers, bunions, sea-sickness, landladies, mothers-in-law, all these subjects are discouraged; and just the very things that never hit back, either—except mothers-in-law, of course.

It's very hard; and, besides, it makes it so difficult for the audience to know when to laugh when all their usual cues are missing.

Amusing the Announcer!

In the studio a comedian cannot even rely on the famous old slogan of his profession, "When in doubt, fall down." There's no sense in merely amusing the announcer.

It's a pity, too, for the slogan was a good one; and even one of the most famous comediennes of the present day only discovered that she *was* a comedienne by tripping over the hem of a dress that was too long for her and consequently getting the biggest laugh of her career.

No, it's not all fun being funny by radio. Deprived of all outside aids and limited in material, the radio comedian must needs fall back on humour of what the B.B.C. calls the "intimate" kind.

All subtle humour is at someone else's expense, which is a big point in its favour in these hard times. I should hate it to be at mine; but Scotsmen, of course, don't mind. It's their national form of generosity.

Broadcast humour has a short life. With the exception of the man who was listening to America, the whole of a radio comedian's audience may hear him at a single time, and it's no good repeating the same thing next week for the benefit of the exception. He'll probably be listening to Peru. Broadcasting demands originality, and that's only another name for hard work.

Getting the "Goods."

Most original numbers, of course, one remembers having thought of weeks ago as soon as one hears the other fellow putting them across. Then it's too late, and he won't tell you where he pinched them from, either.

From the foregoing you will have gathered, if you've gathered anything at all, that the radio comedian's lot is not a happy one. Wrong again! As a matter of fact, it's not a bad sort of job at all.

What does it matter if we spend our days in a hopeless search for material, and our nights in wondering how on earth to treat it when it's found? As the bath attendants remarked when they tripped over the springboard and dropped into the deep end, "Well, we're immersed in our work, anyway!"

So here's to radio, and what's a little trouble more or less?

LATEST BROADCASTING NEWS.

FUTURE OF THE RELAY STATIONS.

SIR JOHN REITH'S SALARY—MR. WARRENDER'S RETURN—THE PRINCE AGAIN—THE THREE VALLEYS' FESTIVAL.

IT is now becoming apparent that the B.B.C. is not nearly so confident as it was that the relays can be dispensed with when the regional transmitters come on the air. These doubts found expression when the Chief Engineer and the North Regional Director went to Sheffield the other day to deal with an acute local agitation for the retention of the Sheffield relay station.

A rumour had been circulating that the B.B.C. had given notice to terminate its occupancy of its premises at Sheffield, where local interest in broadcasting always has been very active. Confronted with a good deal of violent feeling, Mr. Ashbridge promised to keep on the local transmitter, at least temporarily and possibly for good.

If there is a case for it at Sheffield, there is a stronger one at Stoke-on-Trent, at Hull, and at Liverpool. Presuming, then, that these local relays are continued under the Regional Scheme, what programmes will they take to distribute?

This problem has not been discussed yet, but the probability is that they would take the National programme, certainly so if opinion at Sheffield is any criterion. In this case all listeners would be sure of the National, and those with better sets would get the Regional as well.

Sir John Reith's Salary.

It is understood that this has not been changed in the four years of the Corporation's existence; it remains at £6,000 a year, but there is a feeling that Sir John may be tempted to go elsewhere unless something is done about his emoluments before long. People at Savoy Hill and in big business generally have no doubt that Sir John is a £10,000 a year man. But can the B.B.C. pay such a figure in view of its semi-public character?

Mr. Warrender's Return.

A pianist of considerable distinction as a broadcast artist is giving a recital in the Birmingham studio on Thursday, May 14th. It was in the early days of the B.B.C.—to be precise, on Christmas Day, 1921—when Frederick Warrender heard Mr. Percy Edgar, the Regional director for the Midlands, who was then supplying the programmes for the old 5 I T transmitter from a little studio at Witton and working practically single-handed, announce that owing to certain unforeseen circumstances the programme would consist of gramophone records.

Actually what had happened was that the artist engaged had failed to turn up for the performance owing to the wintry conditions, which caused Mr. Warrender to gather together a few pieces of music, call a taxi-cab, and turn up at the studio within twenty minutes to give his first broadcast recital.

Since those days Mr. Warrender has made many appearances before the microphone, not only in this country but in America, India and the Far East. Another of his distinctions was to give a recital from C K A C, Montreal, in 1923, during the first relay of a Canadian programme to British listeners.

The Prince Again.

The Prince of Wales is broadcasting for the first time after his return from South America, when he speaks as the guest of honour at a dinner given by the Clothworkers Company in connection with the British Wireless for the Blind Fund, which is to take place at the Clothworkers Hall on Wednesday, May 27th. The Prince is President of the Fund and his speech will be relayed as part of the National programme.

The Three Valleys' Festival.

It is a thousand pities that the people of Wales should be passing through such distressing times that only by a miracle can they hope to raise the £7,000 required annually as half of the total sum necessary to maintain their National Orchestra.

The B.B.C. is willing to find its share, but it seems hopeless that at the end of the next six months sufficient guarantees will be forthcoming to enable the orchestra, of which Wales is so proud, to go on.

There is no doubt that as a nation the Welsh are more musical than the English, otherwise they could never hope to make the Three Valleys' Festival, which last year took place in the Pavilion, Mountainash, for the first time, an annual event.

Three Fine Concerts

Mountainash, located in the heart of the South Wales Coalfield, feels the depression as acutely as anywhere, and yet arrangements have been made for the festival to be held this year from Saturday, May 9th to 16th, inclusive. The National Orchestra will, of course, take part, and listeners will look forward to hearing three concerts which are to be broadcast.

The first takes place on Tuesday, May 12th, when from 7.45 to 9 p.m. Handel's "Messiah" will be performed. The solo artists are Dora Labbette, Margaret Balfour, Walter Glynne and Harold Williams, who will be supported by a choir of nearly 1,100 voices.

The second Festival concert, which will be broadcast on the Daventry National wave-length, takes place on Wednesday evening, May 13th. In this a male voice choir of 480 voices will take part and violin solos will be played by Sybil Eaton.

The last concert to be broadcast takes place on Saturday, May 16th, when Handel's "Elijah" will be performed, the choir on that occasion being augmented to nearly 1,200. Stiles-Allen, Gladys Ripley, Heddle Nash, and Horace Stevens are the solo artists.

FOR THE LISTENER

By "PHILEMON."

Other people's views are not always very interesting, but our popular contributor certainly knocks the nail on the head more often than most critics of the broadcast programmes.

Games.

WITH the coming of Spring and the approach of Summer, Capt. Wakelam and Mr. Allison temporarily lose their jobs at the microphone. But games do not cease. In our country at least there is no off season for games.

We have to thank our climate for this. We can be energetic all the year round. Last year, in Italy, I saw some Italians playing golf in August—but it was lazy stuff, and exceedingly hot stuff—in another than the slang sense.

They dripped. Their paths "dropped fatness." The only one who seemed really pleased with it was the lady who presided over the canteen.

The tennis courts out there are as deserted, until the sun begins to go down, as a northern sea-beach in winter, or as Twickenham or Highbury in summer.

We are the great game-playing people of the world. We have taught the rest. It is one of our contributions to internationalism—and by no means the least.

Wimbledon is as great a league of nations as Geneva. In one sense it is even greater; for rivalry is one of the strongest bonds which hold men together in friendship. It is easy to love your enemies at Wimbledon or St. Andrews or the Oval. The triumph of humanity will come when we can substitute the rivalry of games for that of war.

We have the knack of making games for other people to play. Often now they beat us at our own game, but we taught them.

(*Continued on page 256.*)

Specified for the P.W. "£3 THREE"

These three components rule the efficiency of the circuit, with them the full results as intended by the authors of the "P.W." "£3 Three," and all modern published circuits, are ensured before you assemble—they are the Best components obtainable yet cost no more than others of less repute.

Insist on R.I. and get a copy of the latest edition of the R.I. Catalogue, which is the finest component reference obtainable.

DUAL RANGE COIL

By infallible laboratory tests on the wavemeter and inductance bridge, the R.I. Dual Range Coil is proved to give the most critically efficient results.

It is absolutely to the correct standard specified by the "P.W." designers and surpasses all in accuracy and finish.

Obviously R.I., as makers with over 28 years' experience in the design and manufacture of radio and electrical apparatus, were expected to produce the best coil and they have exceeded even the designers' expectations.

12/6

The "Dual Astatic"

H.F. CHOKE

To-day much reception is missed by the use of inferior H.F. Chokes. You will be certain of bringing in perfectly all frequencies, and of using the fullest amplification of which your valves are capable by employing the R.I. Dual Astatic Choke.

7/6

Resistance D.C. 650 ohms.
Inductance 60,000 micro-henries.
Overall dimensions, base 2" square by 3¼" high.

The Improved G.P.

L.F. TRANSFORMER

Famous for transformer design and manufacture since the inception of popular radio, R.I. have produced the masterpiece—a new, improved model of the famous original G.P. Transformer. At 10/6 it is the cheapest you can buy if you want real results.

10/6

Resistance Primary D.C. 1,050 ohms.
Resistance Secondary D.C. 6,600 ohms.
Inductance Primary 35/40 henries.
Ratio 3½ : 1. Weight 1 lb. 2 ozs.
Overall dimensions 3¼" × 1⅝" × 2⅝" high.

INSIST ON RI COMPONENTS—THEY'RE BEST

FROM THE TECHNICAL EDITOR'S NOTE BOOK.

Tested and Found—?

A MULLARD INNOVATION.

AN important modification to a number of valves in the Mullard mains range is announced. In future, certain screened grid and detector mains valves can be supplied with a metallised coating on the exterior surface of the bulb, the coating being in electrical contact with the cathode.

This scheme is intended to reduce mains hum, and, in the case of screened grid valves, has the additional effect of reducing inter-electrode capacity.

Increased general stability of all-mains receivers, it is claimed, result from the adoption of these metallised valves.

PLYMAX FOR BASEBOARDS.

Venesta, Ltd., of Vintry House, Queen's Street Place, London, E.C.4, are manufacturers of Venesta Plymax, which is a metal-faced plywood. They suggest that it should prove very useful for radio set baseboards, and point out that it can be supplied faced either with copper or aluminium.

A baseboard measuring 18 by 10 inches retails at 2s. 9d. It does seem to me that Plymax deserves to be widely known among set builders for it is vastly superior to plywood and metal sheet bought separately and then screwed together.

You see the metal, copper or aluminium, as desired, is so fixed that it is just as much part of the baseboard as one of the layers of the plywood itself, and it is, of course, completely smooth and not dented at all like, for instance, a foil-cum-wood mixture.

TONAX CONE ADAPTOR.

There is now a Tonax cone adaptor for use with double-cone loud speakers, and it is, similarly to the single type, a well-made and easily fitted gadget. It brings the construction of double-cone loud speakers well within the scope of average home constructors and, at 1s. 6d., should command a very ready sale.

GECOPHONE L.S. COUPLING UNIT.

There are many arguments in favour of using a choke condenser or transformer output, and cost seems to be the only argument against it. Therefore, it would seem that considerable popularity is assured for the new Gecophone Loud Speaker Coupling Unit, which retails at 19s. 6d., and embodies the necessary choke and condenser built into a neat metal box nicely finished in brown crystalline enamel.

It can be fixed inside a set, fixing holes being provided in the base, or, of course, it can be stood outside.

It comprises a choke which retains its 20 henries inductance with 40 milliamps. flowing through it, and which has a D.C. resistance of 240 ohms, and a fixed condenser of 2 mfd. capacity. There are four terminals, two replacing the loud-speaker connections in the set, and two for the loud speaker itself.

USEFUL ACCUMULATOR GADGET.

Lectro Linx, Ltd., have sent me a pair of their Clix non-short accumulator connectors. These cost 3d. each and are extremely useful articles. They comprise a new and wanted application of the "non-short plug" principle now so widely used in mains units, terminal devices, etc.

Each connector consists of two parts, a solid pin tag which is lead covered to prevent corrosion, and this is fixed on the accumulator. The other part is a socket of the Clix resilient type that you fix to the L.T. lead from the set, and being fully insulated it ensures that no shorting can occur through an unconnected lead dangling near the battery.

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

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

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

FINE VOLUME CONTROL.

The A.E.D. Log Rule Volume Control embodies features usually only found in large and expensive apparatus, and in that sentence I am endorsing in other words the general claim made for the component by the manufacturers themselves.

Yet it is, withal, a compact, single-hole panel-mounting device costing 8s. 6d. You will be able to gather some idea of the novel and ingenious construction of the article from the accompanying photograph.

The resistance material is sandwiched between a series of metal plates and the contact arm sweeps across the edges of these. An exceptionally large metallic contact area is achieved, and because of the special structure of the resistance element, the fine current carrying capacities of 8 milliamps for the 100,000 ohms and 3 milliamps for the ½ megohm models are obtained.

The variation of resistance is graduated or tapered instead of being exactly proportional with the movement of the arm, and this is, of course, a most desirable feature and one which I have frequently advocated for all volume controls. I really have not space to detail several other points that appeal to me in this A.E.D., and can only say in conclusion that I consider it to be a most commendable production that reflects credit on both designer and manufacturer.

RANGE OF BURTON COMPONENTS.

I recently received a large number of components from Messrs. C. and H. Burton. Among these components are five-pin valve holders, three- and four-point wave-change switches, H.F. chokes, grid-bias clips, and various types of variable condensers.

The five-pin valve holder, which will, of course, take ordinary or A.C. valves, is a particularly attractive article. I specially like the way the terminals slant outwards from the base. By making them do this they become more readily accessible than is usually the case.

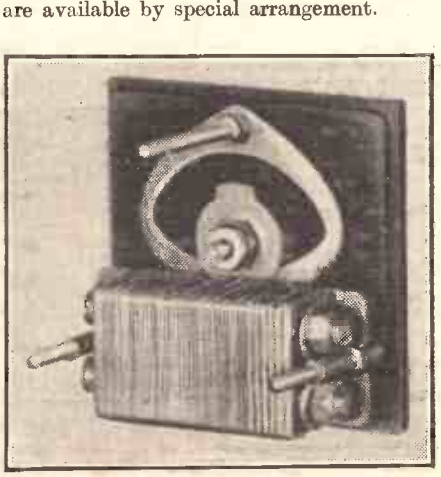
The valve holder, which is of the anti-microphonic type, embodies excellent springing, and the sockets are so well sunk that accidental short circuits across the pins of the valve are rendered impossible.

The Burton binocular choke is completely effective over ordinary and long waves, and the point I like about this component again concerns the terminals. These are much more substantial than usual, and I wish more terminals of similar calibre were met with in radio.

Among the Burton variable condensers there is a fine single-drum type the action of which is first class, and the panel appearance of which would enhance the artistry of any set.

WATES ROTARY CONVERTER.

Those constructors who have had cause to grumble at the limitations of D.C. mains need no longer do so. The Standard Battery Company have now available 60- and 120-watt converters that will transform 220 D.C. mains to 220-volt A.C. 50 cycles. Other voltages and outputs are available by special arrangement.



The back of the A. E. D. Volume Control with the protective moulded casing removed.

THE £3 THRE

JUST £1 per stage! That is "something like" a really inexpensive receiver; although perhaps in these days of cheap radio you may not think it much to shout about.

But it is, and for this reason. Not one little bit of efficiency has been sacrificed to keep the cost down. In spite of the price, this receiver is capable of remarkably good results, is easy to operate and simple to build. It is quite up to the very high standard set by POPULAR WIRELESS sets.

Remarkable Value.

By now you are probably wondering how, if all this is true (and it undoubtedly is), we have managed it. We have used the same principle as was employed when designing the "30/- Two," and the "£4 Four," two very efficient and popular sets which were described a little while ago in POPULAR WIRELESS.

Without sacrificing efficiency in any way, we have sought out the simplest and cheapest method of obtaining the desired effects.

The components chosen, are, as far as possible, the cheapest ones which will do the required work efficiently, and which, of course, come up to our standard so far as quality is concerned.

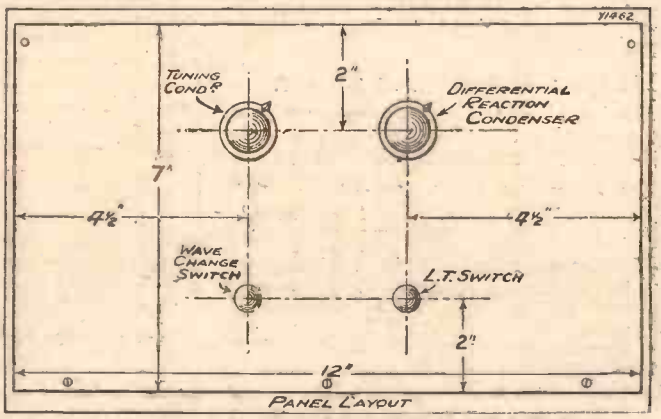
Two illustrations of how the simplest and least expensive schemes have been employed are the cabinet and battery connections. The former is home-made, and is so arranged that the bottom of the cabinet is also the baseboard of the receiver. In the latter case, instead of using terminals, flex wires are run straight from various points on the components, through a hole in the terminal strip which carries the aerial, earth and loud-speaker terminals direct to the batteries.

In the list of components, the makes which we actually employed are given first, with suitable alternatives following. The prices of various makes of components vary to such an extent that it is possible with some for the price to come to more than three pounds. It must also be remembered, however, that by very judicious buying some constructors may be able to make the set up for even less than three pounds.

Now let's take a look at the circuit arrangement. A "P.W." dual-range coil is employed for tuning, with Brookmans coupling for the long waves, to prevent medium-wave stations breaking through on this band.

This coil will thus provide sufficient selectivity for most cases. If you live fairly near to a dual-wave transmitter, and find that you can do with a little more selectivity, you can add a double rejector or a "P.W." "Flexi-Coupler," as described in POPULAR WIRELESS for February 28th, No. 456.

REDUCED TO A MINIMUM



The panel controls are four in number, but you'll get ten times the number of stations if you are at all well situated!

"Decoupling" Unnecessary.

Of the two L.F. stages, the first is resistance-capacity coupled, and the second transformer coupled. You will note that a 50,000-ohm resistance is used in the anode circuit. This is lower than usual, but was found to give all the amplification required.

It ensures that no difficulty with reaction control will result, and enables all decoupling devices to be done away with, without risk of L.F. instability. You will note that only one H.T. positive terminal is provided.

The set is naturally intended for economical running, and consequently a small power valve will be used with 100 to 120 volts high tension. The 50,000-ohm resistance will drop this voltage to just about the right value for the detector so that smooth reaction control is ensured.

Now with regard to the constructional details. You will see that an ebonite panel is not specified. Instead we make use of a three-ply wooden panel $\frac{3}{16}$ in. thick. This is fixed to the baseboard by means of a little fillet of wood, in section about $\frac{3}{8}$ in. square. The panel is screwed to the fillet, and the fillet to the baseboard.

Cabinet Easily Constructed.

The baseboard is $13\frac{3}{4}$ in. long and $8\frac{1}{2}$ in. from front to back. The panel should be mounted so that its front surface is $\frac{5}{8}$ in. from the front edge of the baseboard.

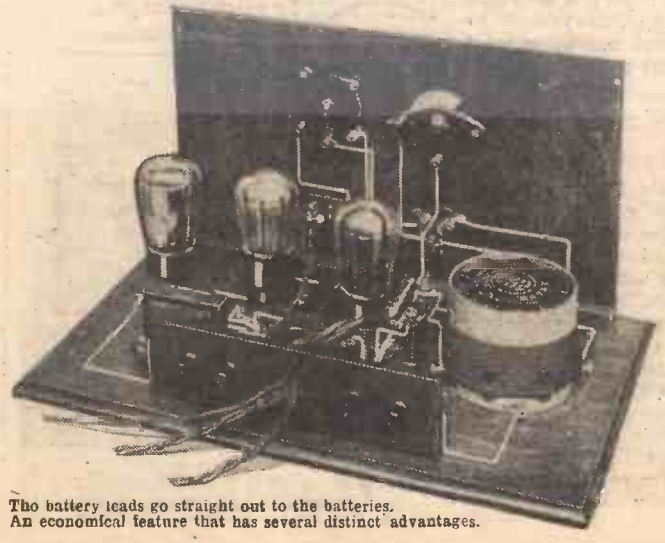
The terminal strip, which is mounted in just the same way as the panel, should also be arranged so that its outside surface is $\frac{5}{8}$ in. from the back edge of the baseboard. Both the panel and the terminal strip are, of course, mounted equidistantly from the ends of the baseboard.

The cabinet, or rather the remainder of the cabinet, consists of the two ends, the back and the lid, which is hinged to the back piece. The lid should be the same size as the baseboard, and of $\frac{3}{8}$-in. plywood, the same sort of wood being used for the ends and back. The baseboard may be a little thicker or the same sort, as desired.

The back should be the same size as the panel, namely, 12 in. by 7 in., and the

Sixty shillings—that is all this fine set will cost you even if you have to buy all the parts and have none on hand. And yet it is an attractive proposition from every point of view and is capable of giving a sterling loud-speaker performance.

AND NO TERMINAL TROUBLES



The battery leads go straight out to the batteries. An economical feature that has several distinct advantages.

YOUR GUIDE TO THE COMPON

- 1 Panel (see text).
- 1 Cabinet (see text).
- 1 ·0005-mfd. tuning condenser, solid dielectric type (Ready Radio, or Burton, etc.).
- 1 ·0001-, ·00013- or ·00015-mfd. differential reaction condenser (Ready Radio, or Igranic, Lotus, Lissen, J.B., Polar, Formo, Wearite, Magnum, Parex, Ormond, Dubilier, etc.).
- 1 3-point wave-change switch (Bulgin, or Ready Radio, W.B., Wearite, Keystone, Ormond, Magnum, Red Diamond, etc.).
- 1 L.T. switch (Ready Radio, or Goltone, W.B., Igranic, Red Diamond, Lotus, Lissen, Keystone, Benjamin, Wearite, Magnum, etc.).
- 1 "P.W." Dual-Range Coil or Keystone, Wearite, Radio, Goltone, Magnum, well, Parex, etc.).
- 1 ·002-mfd. mica compressio condenser (Formo or R.I.
- 1 50,000 ohms s[illegible]hetti resi (Bulgin or Sovereign, Radio, Keystone, Mag Lewcos, etc.)
- 1 ·0003-mfd. fixed con and grid leak clips (T.C. Telsen, Lissen, Ready Dubilier, Igranic, Edis Ferranti, Formo, Mul Sovereign, Watmel, etc.).
- 1 ·01-mfd. fixed condenser (or Telsen, etc.).
- 1 2-meg. grid leak (Dubil Igranic, Telsen, Ferranti, Ediswan, Mullard, etc.).

A FINE COMBINATION OF ECONOM

two end pieces should be 7½ in. by 7 in. Screw the ends to the back so that they overlap the latter, and then attach the lid to the back with two small hinges.

When the set is completed the baseboard will be fixed to the end pieces by screws passing upwards through the bottom into the latter. It is just as well to make the holes for these screws now and fit the cabinet together to see that it is O.K., and then to remove the panel and baseboard again, before mounting the components and wiring up.

Very Little Drilling.

Only four holes are needed in the panel, one each for the L.T. switch, the differential reaction condenser, the tuning condenser and the wave-change switch. In connection with the latter, make sure that it is the correct type.

Some three-spring switches give single-pole change-over switching, and would naturally be quite unsuitable to use for wave-changing. The correct type is one in which all three contacts are connected together with the switch in one position and all separated in the other position. You will note that the tuning condenser is of the solid dielectric type. This is another point where economy has been effected.

Little need be said about the wiring since it is made quite clear by the large diagram. Use ordinary rubber covered flex for the battery leads.

Wide Choice of Valves.

The flex leads are marked at both ends, namely, at the point of connection in the set as well as at the battery end, so there is no reason for getting them muddled up. You will note that both high-tension negative and grid-bias positive are joined direct to the negative of the low-tension accumulator and not to points inside the set.

And now just a few lines about accessories and operation, and you will know all about the "£3 Three." First with regard to valves.

You will not find the detector valve at all critical. It may be of the H.F. or special detector type, or even an ordinary L.F. valve. The second valve should be of the L.F. type and the last a power valve; or super-power taking about 120 volts H.T., if you are going to use an H.T. mains unit.

The operation, so far as the tuning and reaction condensers are concerned, is quite normal, as also is the case with the L.T. switch. The wave-change switch should be pulled out for medium waves and pushed in for long waves.

With regard to the ·002-mfd. maximum compression type variable condenser on the baseboard, this is for adjusting the degree of selectivity on long waves. Start with it at about minimum, and increase its value by screwing down the knob until you get the degree of selectivity required, with good results so far as volume is concerned.

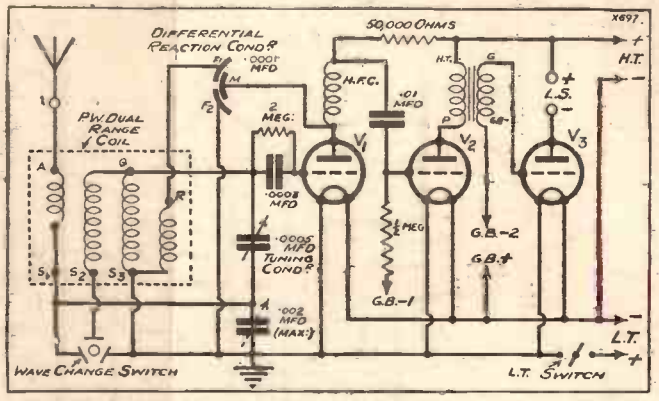
G.B. Voltages.

Turning to the grid bias, as far as the G.B. — 1 plug is concerned, which supplies the first L.F. valve, you can find the best value by trial. It will most likely be between 1½ and 4½ volts.

The value for G.B.—2 should not be ascertained by trial because damage to the valve might result. You will find that suitable values of grid bias for differing high-tension voltages are recommended by the makers of the valve. You should be guided by these, but there is no harm in

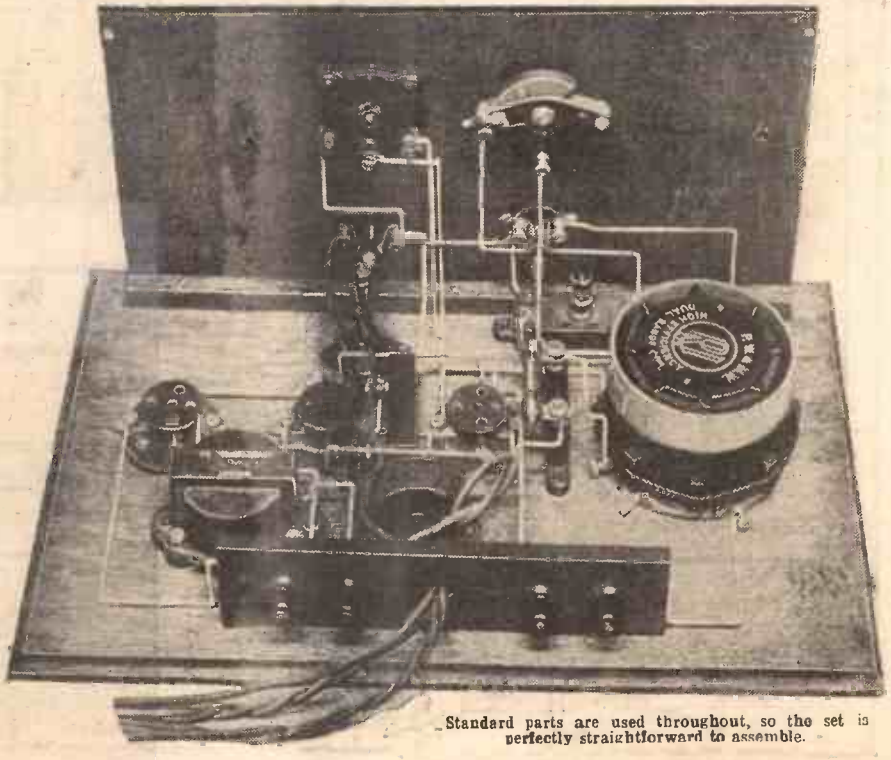
(*Continued on next page.*)

WELL WORTH WAITING FOR



The "£3 Three" is complementary with the "30/- Two" and the "£4 Four" and uses most of the circuit features of these popular sets.

AN EASY SET TO BUILD



Standard parts are used throughout, so the set is perfectly straightforward to assemble.

NENTS NECESSARY

l (R.I., Ready Tune-	1 ½-meg. grid leak and holder (Dubilier, etc.).
on type ., etc.). istance Ready num,	3 Valve holders (Clix, or Telsen, Lotus, Igranic, W.B., Lissen, Bulgin, Benjamin, Dario, Formo, etc.)
	1 H.F. choke (Telsen, or Lewcos, Keystone, Ready Radio, Varley, Parex, Lotus, Dubilier, R.I., Wearite, Igranic, Magnum, Watmel, etc.).
denser C., or Radio, wan, lard,	1 L.F. transformer, low or medium ratio (Igranic Midget, or Telsen, Lissen, Varley, Ferranti, R.I., Lewcos, Lotus, Mullard, etc.).
	1 Terminal strip, 7 in. × 2 in.
Lissen,	4 Terminals (Belling & Lee, or Eelex, Igranic, Clix, etc.).
ier, or Lissen,	Screws, Glazite or Lacoline, flex, etc.).
	Plugs, spade tags, etc. (Eelex, or Igranic, Clix, Belling & Lee, etc.).

MY AND EFFECTIVENESS

THE "£3 THREE."

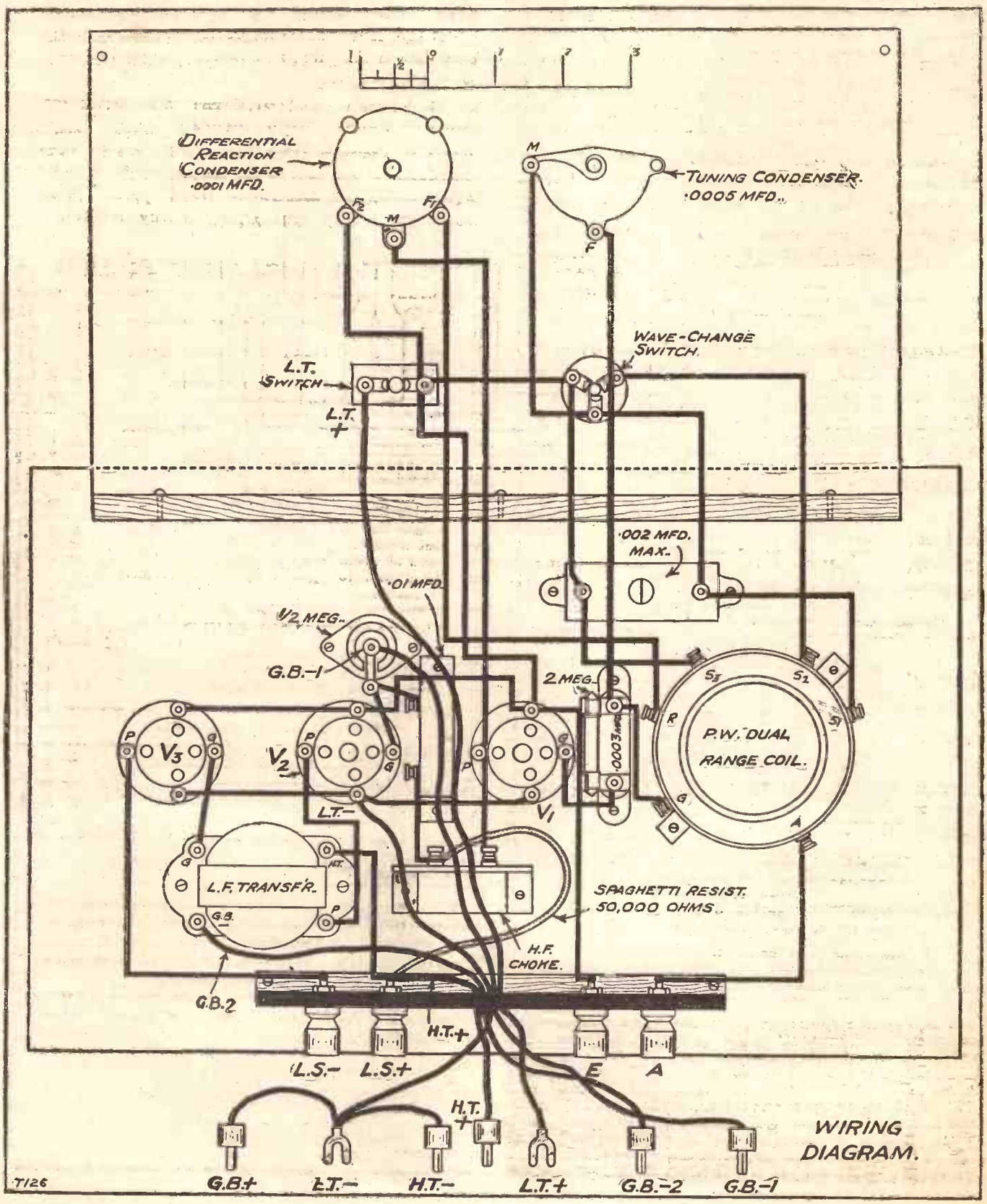
(Continued from previous page.)

trying a little more or a little less bias, say 1½ volts in either direction. Whatever you do, always switch the set off while you adjust the value of the bias on G.B. — 2.

There is just one more point, and it concerns your aerial. If this is on the largish size, or seems to introduce rather a lot of damping, a condenser in series with the aerial lead to the set may be helpful.

The most convenient kind to use would be a ·001 mfd. max. compression type variable, joined up externally to the set. Do not reduce its value more than necessary, and adjust it to compromise between the best settings for long and medium waves.

And that completes the details of one of the finest value-for-money receivers ever described.



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(As Kit B, with attractive oak cabinet.)

Components for completing the "COMET" TWO
16/-. If ordered with the "Comet" Two Kit, add 1/6 per month to the monthly payments.

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(Complete Kit of Components, as specified.)

KIT B - £8 17 6 Or 12 monthly payments of 16/3
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KIT A - £3 8 6 Or 12 monthly payments of 6/3
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KIT A (less valve and cabinet) £2 19 6 or twelve equal monthly instalments of 5/6

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1 Polished plywood panel, 12 in. × 7 in. drilled to specification		2	0
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1 ReadiRad 3-point wave-change switch		1	6
1 ReadiRad L.T. on-off switch			10
1 ReadiRad "P.W." dual range coil		12	6
1 Formo ·002-mfd. maximum compression condenser		2	3
1 ReadiRad 50,000-ohm link resistance		1	9
1 ReadiRad ·0003-mfd. fixed condenser			10
1 T.C.C. ·01-mfd. fixed condenser		2	6
1 ReadiRad 2-megohm grid leak			10
1 ReadiRad ·5-megohm grid leak		1	4
3 Telsen 4-pin valve holders		3	0
1 Telsen H.F. choke		2	6
1 Telsen "ACE" L.F. transformer		8	6
1 Terminal strip, 7 in. × 2 in. × 3/16 in. drilled to specification			7
4 Belling-Lee terminals, type "R"		1	0
Wire, screws, wander plugs, spade terminals, etc.		1	7
	£2	12	0
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KIT A	£2	12	0
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KIT C (with valves and cabinet)	£4	14	6
Or 12 equal monthly instalments of		8	8

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Name .....

Address .....

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Kit Required .....

CAPT. ECKERSLEY'S QUERY CORNER

Some questions and answers of general radio interest that will aid you in your radio reception.

DON'T USE A RESISTANCE—DOES DISTANCE MUTILATE MODULATION?—LOUD DANCE BANDS.

Under the above title, week by week, our Chief Radio Consultant comments upon radio queries submitted by "P.W." readers. Don't address your questions to Captain Eckersley, however, a selection of those received by the Query Department in the ordinary way will be answered by him.

Don't Use A Resistance.

"ANXIOUS" (London).—"My mains have recently been increased from 110 volts A.C. to 200 volts A.C., the frequency having remained constant. My present mains transformer is, of course, useless at this voltage.

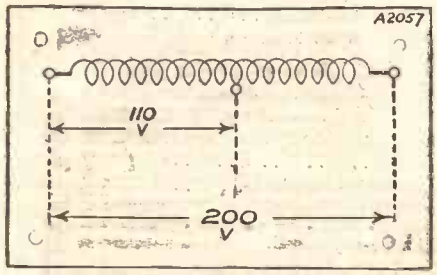
"Is it possible to insert a resistance in series with the primary of the transformer to reduce the voltage to 110 volts?"

It would be better to use what is called an auto-transformer. The connections are as shown below.

The coil is a tapped choke, tapped, that is, at a suitable tapping to reduce the volts from 200 to 110.

Your best plan is to give your requirements to a transformer manufacturer (or local dealer), instal your choke (or transformer), when everything will be quite satisfactory again.

HOW IT'S DONE!



The best way to break down the voltage of A.C. mains to a lower voltage is by means of what is known as an auto-transformer as illustrated diagrammatically above.

On second thoughts, do not your set makers provide for different A.C. voltages? Surely—— ?

But perhaps you have a home-made set, in which case my remedy applies. Do *not* use a resistance, it's wasteful, while the way I recommend is 90 per cent. efficient.

* * *

Does Distance Mutilate Modulation?

J. McK. (Montreal).—"Why is it possible to receive the carrier wave of a telephony station only at extreme distances?

"A year or two ago I was in Nova Scotia, and it was often possible easily to receive Daventry 5 X X after dark. On some occasions, however, only the carrier wave of this station could be picked up, and could not be 'resolved' into signals by the most careful adjustment of the receiver.

"On these occasions the carrier seemed to be no weaker than on the occasions when it could be 'resolved' into signals.

"I do not understand this, as it seems to me that if the carrier 'comes over,' so must the signals, and ability to receive one should imply equal ability to receive the other.

"Does distance 'mutilate' modulation?"

No! You cannot say exactly that "distance" mutilates modulation. You can say more accurately that (1) modulation is much feebler than the carrier; and (2) heterodyne reception is more sensitive than the methods which must be used for the detection of pure telephony.

When a carrier is modulated we assume that we can represent the result as to co-existence of a steady carrier and other (side-band) frequencies. Thus at any instant, and with normal modulation, the average condition is to have a carrier of amplitude, say (A), and side-bands of average amplitude 1-5th A.

Again, if you make a receiver oscillate, then it will detect a feeble heterodyne easily because the heterodyne rides on the crests of the locally produced oscillations and gets far up the detector curve.

* * *

Loud Dance Bands.

L. C. (Romford).—"Why does dance music played in the London studio appear to be so much louder than most other forms of musical transmissions? I always adjust the volume control on my receiver when receiving band or orchestral music so that there is a minimum of needle flicker shown by a milliammeter in the plate circuit of the output valve.

"In general, to achieve this condition, the volume control, which is a potentiometer functioning as a grid leak in the first R.C. coupled L.F. stage, always has to be set at about the same position.

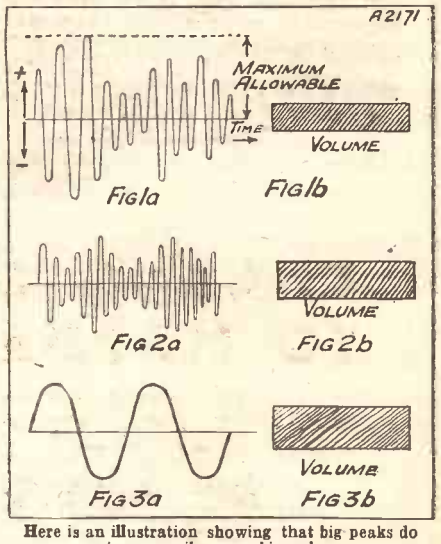
"It would appear, therefore, that conditions at the receiver are kept fairly constant, and yet I am certain that the B.B.C. Dance Band creates a greater volume of sound than does, for instance, the Wireless Military Band. Is this an illusion, or does the volume differ? Because I cannot see how it can."

First realise that when anyone plays or sings or makes noises in the studio they really create varying voltages applied to the grids of the valves in the transmitters. If this voltage exceeds a certain amount the transmitter is overloaded and distorts.

Thus a man in the control room has to see that the peaks of the voltages sent up to him from the studio do not exceed a certain value. We need only consider the plus values, the negative values will be self-evident.

Now, if we could plot the instantaneous value of the voltages against time we might get a diagram like Fig. 1a. But what is the volume?

PEAKS, NOT VOLUME



Here is an illustration showing that big peaks do not necessarily mean big volume.

I think a little consideration will show you that we could add up the areas enclosed by the envelope of the curves, and that this could represent volume. Thus see Fig. 1b in which is the volume over a given time.

But certain types of sound give a much larger volume for given maximum peak than others. This can be seen by drawing a very peaky thin curve like the one shown, or a very rounded curve having the same peak like the other one in my sketch.

Lastly, in "artistic" renderings, the control room man wants to get large contrasts between ff and pp, so he cuts down a lot of the music to get true ff. I adore jazz by Jack Payne, but quite probably it is not artistic!

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

By R. W. H.

AS the days lengthen and the periods of darkness become shorter the superiority of the long waves as "distance-getters" is made more and more manifest. The wise seeker after foreign programmes defers his medium-wave explorations until a later and later hour as we approach the height of summer, and places increasing reliance upon transmissions within the band between 1,000 and 2,000 metres.

To take full advantage of the higher-wave stations it is essential that the set should be thoroughly efficient upon the long waves. Some sets do not give a good account of themselves on the higher waveband since they are apt to become unstable to a greater or less degree when the wave-change switch is turned over.

Try Changing Your Choke.

Matters can often be set right by attention to two points. The first is the high-frequency choke (or chokes, if there are more than one). Some chokes have a resonance peak between 1,500 and 2,000 metres and where this occurs the set is very liable to plunge into oscillation. The remedy is obvious.

The second point concerns adequate decoupling of circuits. Instability that we used to put down to interaction between coils or low-frequency transformers has been shown to be due in many cases to back-coupling introduced by the resistance of the high-tension battery or H.T. eliminator. Every plate circuit in the set, except the output circuit, may need to be decoupled by the use of resistances and condensers, and particular attention should be paid in screen-grid sets to the decoupling of the screening gird.

Applying Positive Potential.

If reaction is fierce upon the long waves when these points have received attention it is a very sound scheme to incorporate a potentiometer in the grid circuit of the detector valve. The grid-leak return, instead of being taken direct to low tension positive, is connected to the slider of the component. In this way an adjustment is easily found which gives the positive grid potential that provides the smoothest reaction consistent with good signal strength.

On the long waves there are some very interesting stations. What we may call the good old standbys will be known to most readers. These are Huizen, Radio-Paris, Motala, Kalundborg and Oslo.

All are highly efficient and there are few good sets which fail to provide satisfactory reception from them at any time of the year in all parts of this country. The rather more difficult—and therefore more interesting stations to the long-distance man—are not so numerous as they are upon the medium-wave band. Still, there are quite enough of them to keep the man, who likes his log to show a big bag, busy during the summer months.

Right up at the top of the band is Kaunas, which we used to know as Kovno. This is a 7-kilowatt station in Lithuania. It is seldom a strong transmission, though quite fair reception is often possible with a sensitive set.

A "Lusty" Long Waver.

Lahti on 1796 metres is a queer station. Situated in Finland, and therefore at no very great distance from the northern parts of this country, he has an output rating of 54 kilowatts. On my big set I receive him quite well, but I must admit that he takes some bringing in on others.

Still, he is there and if you find a favourable moment you should be able to log him. Sharp tuning is demanded since he is only 7 kilocycles away from Huizen on one side and Radio-Paris on the other.

Zeesen is difficult to receive in many localities when the Daventry National is at work since there is only 9·5 kilocycles between the two. Try for him on Sunday mornings when the home station is silent. You will find that he comes through at splendid strength.

Other stations worth your attention are Angora on 1,538 metres, Warsaw on 1,411 metres, Reykjavik on 1,200 metres and Tiflis on 1,060 metres.

SHORT-WAVE NOTES

Here are some useful remarks on happenings down on the short waves by W. L. S., a very well-known amateur transmitter and a leading expert on the subject.

REPORTS of reception of W 2 X A D and all the other American shorter-wave broadcast, continue to flow in making it look as though this spring is assured, from the radio-fiend's point of view. I don't know whether readers have noticed the same as I have in this connection—that if February and March are good, conditions usually keep well up until the end of June, or even later.

If, on the other hand, February is unreliable, almost certainly there will be a "wash-out" before the D X season is really over.

A DX Directory.

There have been so many queries lately on the subject of amateur call-signs, and the like, that, at the risk of boring those already "in the know," I must repeat the details about Call Books. "T. C." and others, please note. The "Radio Amateur Call Book Magazine" contains the call-signs of every amateur station in the world, together with their full addresses in countries where they are licensed by the Government.

In the case of other countries, the "Q S L Bureau," to which reports may be sent, is given. This publication, which will soon rival the Telephone Directory in size, may be obtained from the Radio Society of Great Britain, 53, Victoria Street, S.W.1, for 4s.; or 3s. if you are a menber. It is published quarterly in the U.S.A., and supplies arrive over here soon after the beginning of each quarter.

Now for "T. C.'s" special benefit. *All* U.S.A. amateur stations prefix their call-sign with "W." Those in the book without "W" in front of them are simply those whose addresses remain unaltered, and the old type is left set up. As new ones are added the "W" is put in front of them, but there is no difference whatever between these and the others.

Incidentally, "T. C." has logged quite a bag of U.S. amateurs on telephony in the 20-metre band. For the benefit of others, the best are generally W 8 D L D, W 1 I D, W 2 S F, W 2 Q N, W 2 A F Q, W 2 A O E and a whole flock of "W 9's" who are harder to get, but always very good.

Heard Any "J's"?

"C. A. M." inquires as to the whereabouts of "J 1 A A," with whom Rugby (G B S) works occasionally. J 1 A A is certainly a Japanese station, and, to the best of my knowledge, he is located in Tokio. On this subject, I might mention that the Japanese amateurs may still be heard most evenings on 20 metres. The best times appear to be between 1700 and 1830, G.M.T.

I have heard J 1 D P, J 1 D R, J 1 D O, J 1 D Y, J 3 D D, J 3 D E, and J 5 C C up to date. This little burst from the Far East is, to my knowledge, a thing quite unparalleled in the annals of amateur radio. Not only do we receive them quite well over here, but it seems relatively easy to get our signals back. Quite a large batch of Britishers have made their first contacts with "J" during the past few weeks.

Quite a long time back I invited claims from readers concerning the number of different countries they had heard "on the air." "G. C. A.," of London, came along with 90 odd, and no one seemed to have a word to say after that! Can I take it that no one can claim to have beaten "G. C. A.'s" record? If so, I shall feel very pleased with myself, because his receiver is a—— (But why say more?)

A Real Record!

Incidentally, among the amateur transmitters in this country there are a number who can claim *two-way* contact with over 80 countries. The highest score so far, to my knowledge, is 93, although a Frenchman has knocked up a total of 105 at least. It makes one wonder where these fellows unearth all their countries from! Of course, for short periods there have been all sorts of small states and islands "on the air," being represented by one station only.

Macao and Guam (mentioned a fortnight ago) are still active, but I should advise prospective "fishermen" to hook them quickly, or they may disappear for ever.

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

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

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

QUESTIONS AND ANSWERS

THE "COMET" H.F. UNIT.

P.B. (Caterham)—"I have a detector and L.F. set which is not selective, and I want more foreign programmes. I am told there is a 'Comet' H.F. Unit which I could add to it, and should like to know if it is so, where the details appear."

Full details for making the "Comet" H.F. Unit appeared in "P.W." No. 459 (March 25th, 1931). This back number of "P.W." may be obtained through a newsagent, or direct from The Amalgamated Press, Ltd., Back Number Dept., Bear Alley, Farringdon Street, E.C.4. Price 4d. per copy post free.

MOORSIDE'S MASTS.

W. W. A. (Whitby).—"Having scraped up enough money for the licence we got the old 'bus out, and thought we would make a trip to Moorside Edge to see the new B.B.C. station. It is a staggerer. We did not get inside, of course, but there was plenty to see in the masts.

"Why are they insulated like that, and why do they put insulators in the guy wires? Another thing that strikes anyone of a practical turn of mind is what will happen when a gale or a blizzard blows against those tremendous high masts? Is there a danger of them coming down, or is it true that the ice will be melted off them.

The B.B.C. itself admits that although the Moorside site is a good one from a broadcasting point of view it is, to say the least of it, unfavourable for the erection and maintenance of high aerials.

So very special attention has been given to the fact that severe weather conditions are to be experienced, and it is for this reason that it has been found necessary to design the aerial system with particular care. Theoretically it is now capable of withstanding a wind velocity of 100 miles an hour!

It is true that the formation of ice on the aerial conductors, with consequent mechanical overloading of the whole aerial system, has been guarded against by provision for the power station generators to be connected directly to the aerials, and to get rid of the

(*Continued on page 254.*)

"CAN'T GET THE SET TO WORK?"

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

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

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

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

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

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A SOVEREIGN SPAGHETTI RESISTANCE (50,000 ohms 1/9) IS SPECIFIED IN THE "THEE POUND THREE," USE SOVEREIGN WHEREVER YOU CAN ON THIS SET.

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Fit Sovereign to improve any circuit.

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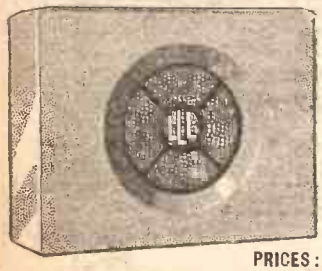

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This amazing model is fitted with two variable tappings of 0/100 and 0/120 Volts respectively, and one fixed of 150 Volts, and the output of 150 Volts at 25 m/A is twice that of any other Unit at the price. The combined L.T. Trickle Charger automatically charges either 2- 4- or 6-Volt Accumulators from the mains. A.C.188 is guaranteed for 12 months, and is built to conform with all necessary regulations. It is suitable for any set, standard or portable, up to 5 valves.

Ask your dealer for demonstration, and, in case of difficulty, write direct for Folder No. 55 to :—

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CLARKE'S "ATLAS"

ALL-MAINS UNIT

RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from page 252.)

ice or snow by passing through them a current of several hundred amperes. It is reckoned that this operation will take about twenty minutes to carry out, and the power used for it will be of the order of 100 kilowatts.

Each of the North Regional masts has been insulated at the base by porcelain insulators in order to avoid the possibility of irregular radiation from the aerials caused by what is termed the "mast shadow" effect (incidentally, you may be interested to know that each of those masts weighs about 40 tons!) Much the same reason applies to the insulators in the guy wires.

SWITCHING OUT THE MIDDLE VALVE OF THE "COMET" THREE.

F. W. D. (Finchley, N.3).—"My friend has told me what a wonderful set the 'Comet' Three is, and although at present I am working a straight two I have decided to make the 'Comet' Three. I would be glad if you would give particulars of a simple single-pole switch by which the middle valve could be cut out so that for London programmes two valves only could be used.

"In Finchley two valves are quite sufficiently loud, and if foreign stations are appreciated then three valves can be used."

Although it used to be common practice to switch out the middle valve of a three-valve set, nowadays when current consumption of the valves is so much lower it is unusual. And the higher magnification of the valves and greater efficiency of the modern set often give rise to complications which did not formerly appear.

Moreover it would not be quite as simple as you think, for unless you are going to pull the second valve out of its socket every time (which is inadvisable), it will be necessary to provide for cutting off its filament supply without unduly disturbing the rest of the wiring of the set, as well as to switch over the input to V_3.

Again, decoupling is now arranged in modern sets which was not the case when such switching was all the rage. But if you care to try it you will need the single-pole double-throw switch for the plate connections, and also an on-off switch for the V_2 filament.

This latter would have to be inserted in the lead which joins to negative filament of V_3, to the negative filament of V_2: and if you are using an L.F. transformer with an earthed core it may be necessary to remove the earthing connection from the filament side of the new switch to the H.T. – L.T. negative side of it.

The single-pole double-throw switch which is to alter the plate connections would have first to be mounted in place, and then the 10,000-ohm spaghetti resistance which now goes from the plate of V_1 to P on the first L.F. transformer should be removed from this latter and joined instead on the centre contact of the S.P. – D.T. switch. One of the outer contacts of this switch is now joined to the vacant P terminal on the L.F. transformer.

When the switch is in *this* position, the connections are restored for the three valves. The other outer terminal of the S.P. – D.T. switch is next connected by a new wire to the wire which joins the P terminal of V_2 to P on the second L.F. transformer. Leave this wire in place and merely make the extra connection.

When the switch is thrown over into this other position the H.T.+2 terminal will supply the last valve as usual, and also the detector valve via the new lead, the ordinary supply to the detector via H.T.+1 and the decoupling, etc., being disconnected by the action of the switch.

THE POSITION OF THE LOUD SPEAKER.

W. M. G. (Colchester).—"Is it a fact that the actual position of the loud speaker, I mean to say where it is standing in the room, affects the results which are obtained from it?"

Certainly it is, although in many cases an alteration in position may not be noticeable. The fact that it can make a difference is often demonstrated with some sets, where it will be found that if you stand the loud speaker too near to the set it starts a loud piercing howl which will nearly drive everyone in the vicinity out of their minds!

Apart from such cases (which are due to microphonic valve troubles) the quality of apparently normal reception is affected to some slight degree, and a loud speaker stood near a bare wall may sound much "brighter" than when placed before a heavy curtain. Similarly a tendency to "ring" on certain notes is sometimes cured if a little draping is arranged behind the loud speaker, and yet another noticeable difference may often be observed when a loud speaker, especially of the cone type, is turned edgeways on, instead of full on to the room.

The reason, of course (apart from idiosyncracies of the speakers themselves) is that much of the volume of sound reaching the listener is reflected back from walls, etc., and oviously differences in position of the loud speaker and differences in the material such as walls, curtains, etc., placed close to it, will affect this reflected sound and to this extent modify the results obtainable.

FAILURE IN A MAINS UNIT.

"MAINS UNIT" (Belfast).—"My A.C. mains unit has suddenly given up the ghost in H.T. +2. When I put the plug in it the set is dead, but is O.K. when I plug into H.T.+1 and 3. My set is the 'Globe Trotter' with another valve added.

"The interior of the unit was never touched until it gave out. It would not register

(Continued on next page.)

"P.W." PANELS. No. 17.—VARIABLE CONDENSERS.

Their principal use is to vary tuning, and the usual capacity range for this is from ·0005 mfd. (max.) to about ·00005 mfd. (min.).

* * *

Usually the moving plates are air-spaced from the fixed, and the latter are insulated from the framework of the condenser.

* * *

The moving plates are nearly always connected to earth, and the fixed plates to the grid side of the tuned circuit.

* * *

Specks of dust between the plates will cause loud crackling noises when the condenser is rotated.

RADIOTORIAL QUESTIONS AND ANSWERS

(Continued from previous page.)

when I put a voltmeter across it. The output is about 125 volts and 20 milliamps."

You don't say if it is a home-made or a commerical unit, but if the latter your best course is to drop a line to the makers. Repairs, if any, will probably be easily carried out.

If the unit is a home-made one it will be necessary to get at the circuit, either from the original details from which it was made, or from a sketch of the unit and wiring. (An experienced dealer or amateur could probably tell you almost at once what is wrong, but it would be unwise to tackle tracing the fault yourself, as mains unit wiring is distinctly tricky stuff to interfere with.)

In the event of your requiring the assistance of our Query Department to put it right, please send first for the application form, which will be sent post free on request.

RENEWING THE H.T. BATTERY.

W. G. (Bedford).—"My cousin has a three-valver (not so powerful as mine, to be sure) but his H.T. batteries last four, five, or even six months. Three months seems about the outside limit for the same kind of battery with me, and we buy them at the same shop—on one occasion we actually got two batteries at the same time.

"His went about six or seven weeks longer than mine. And I am certain there is no leakage when the set is off, as this has been proved time and again by trying a sensitive milliammeter in the H.T. negative lead when the set was off. No current flows.

"On an average I use mine half an hour a day, or about three and a half hours a week, longer than he does. Should that make all the difference?"

It is probably not so much a matter of time as of the quantity of current consumed by your set, as compared with his. Just because they are both "three-valvers" it must not be assumed that their current requirements are similar.

If both are commercially made receivers the makers will willingly tell you what your cousin apparently knows, viz. the correct H.T. battery to buy for the set in question. His battery may not suit your set.

RADIO SYMBOLS.

No. 17.—THE FUSE.

Its use is to protect batteries and apparatus from the effects of an accidental wrong connection.

* * *

The working principle is that being constructed to carry only a limited current, it burns out or "blows" when excess current attempts to pass.

* * *

When placed in the H.T. neg. lead, by-pass condensers, etc., formerly joined to H.T.—should be transferred to the L.T. side of the fuse.

The total anode current may be calculated from the valve maker's figures, though this is not always easy, owing to the screen current of pentodes or S.G. valves.

Probably your easiest way would be first to measure the total current shown by a milliammeter in the negative lead when the set is working. Then buy an H.T. battery, the makers of which intend it to supply that amount of anode current.

SIZES OF COILS AND THE WAVE-LENGTHS COVERED.

T. W. (Cannock, Staffs).—"When I put in a 70 coil do I go up to twice the wave-length of a 35 coil? Or if I put in 100 instead of 50 do I go up to twice the wave-length?"

It is really much more complicated than just doubling the turn numbers, but as a matter of fact, it does generally work out that twice the number of turns on the coil will give you somewhere about double the wave-length; in other words, the wave-length covered is, roughly, proportional to the number of turns in the coil.

It is, however, important to note that this will not be even approximately correct unless the coils compared are of similar construction—wound on formers of similar size, with wire not too different in gauge, etc.

AN ADVERTISER'S CORRECTION.

In the New Times Sales Co.'s advertisement appearing April 11th, the price of the Ultra A.C. Moving-Coil Speaker was inadvertently quoted as £4 17s. 6d. This should have been £4 12s. 6d., or 12 monthly payments of 8/4.

FOR THE LISTENER

(*Continued from page 240.*)

"Pelota" is chiefly confined to France, and baseball to America; but upon our games the sun never sets. Into whatever distant or remote part of the world the Prince of Wales travels, you will be sure to see a photograph of him playing a round of golf there.

You may be in doubt sometimes as to what clothes you shall take with you on a journey; but you can never go wrong with a tennis racquet or a golf club. To "play the game," or "that is not cricket," are English phrases which have for a long time been embedded in the moral consciousness of civilised mankind.

I do not quite know how to account for this. I thought I spotted one reason when I listened to "Our Bill" describing a village cricket match recently on the wireless. Other countries do not seem to have village greens like we do.

"Whistle Gone Again."

They built their villages round a church; we built them round a "green." The sound that calls them is the church bell on Sunday morning; the sound that calls us is the whistle on Saturday afternoon—"whistle gone again!" as Capt. Wakelam so often has it!

A church invites you to put on your best clothes; the "green" invites you to flannels and shorts, or at least to strip down to your braces and "have a whack." These village greens may go far to account for our instinct and love for games. They are part of our history.

Our nurseries, too, perhaps. I see that Mrs. Clough Williams-Ellis is to talk on "Children's Toys and Games." If she is going to speak of nurseries and indoor-games, she is only just in time this year.

The children are already out with their hoops and tops, or playing marbles. I joined a little squad of them the other day, at marbles in the lane, not because I am any good at it or could show them anything, but for the joy of speaking once again about "alleys" and "glassies."

Broadcasting Summer Games.

And we are out, as well as the children. The evenings are already long enough for a "knock up" on the green after the day's work is over. On a railway journey the other day, I saw cricket nets out, and the tennis nets, and at least one old gentleman in his shirt sleeves rolling the tennis-lawn.

I like a man who plays a game as long as he can hold anything in his hand, or can see the length of a cricket pitch before his nose! Games were never so popular as now; fewer people are content to watch them merely, and more want to play them.

The wireless plays a lesser part in summer games than in winter ones. It doesn't lend itself to the description of a cricket match very well, which is a leisurely affair compared with soccer. Besides, the audience isn't at home if it can help it!

There will doubtless be running commentaries on some of the big tennis matches; and glimpses of the New Zealanders trying their wisdom teeth on our best cricket teams; but it would distress me to hear Mr. Allison trying to describe a golf champion settling down to a putt—which is the next thing in slow-motion to a chess champion making a move.

THE "EXTENSER"

The Editor, POPULAR WIRELESS.

Sir,—In your article in POPULAR WIRELESS dated April 18th, entitled "The Extenser's Warm Welcome," you, sir, refer most courteously to "Amateur Wireless," and compliment me on my ability to appreciate the outstanding merits and importance of Mr. Dowding's contribution to radio science. May I thank you for your flattering references, and say that unfortunately I do not deserve them.

I fear you must have read rather hastily the articles in "Amateur Wireless" under the title of "Wave Changing," inasmuch as you arrived at the conclusion that those articles were written in commendation of Mr. Dowding's "Extenser." If you will be good enough to take another glance at them you will find that we were describing a combined condenser and switch of distinctly different mechanical construction from Mr. Dowding's. Indeed, it was not until after I had arranged for the "Amateur Wireless" articles, and even after I had passed the drawings and photographs, that I first had the advantage of seeing what the "Wireless Constructor" had said about Mr. Dowding's device, and you will, therefore, readily understand that in assuming that our comments had anything whatever to do with the "Extenser" you must have been in error.

I am afraid that both the devices in question are variants (quite unconscious on the part of their respective designers) of a combined condenser and switch illustrated about five years ago in the pages of an "Amateur Wireless" publication, and possibly of POPULAR WIRELESS also, but, of course, as you are probably aware, the earlier device was used for the purpose of placing the condenser either in series or parallel in the aerial circuit, whereas the devices now in question are to be used for altering the tuning coils in the circuit.

Again thanking you for your kindly references to myself, and to the periodical which I have the honour to edit, and trusting that you can spare some of your valuable space for the publication of this letter,

Yours faithfully,

BERNARD JONES,
Editor, "Amateur Wireless."

EDITOR'S NOTE.—Further information obtained from the writer of the above letter led us to consult the issue of our contemporary, dated September 26th, 1925. In this there is included a supplementary handbook, the back page advertisement of which illustrates certain products of a radio firm, one of which is a variable condenser of the old straight-line capacity type, incorporating a series-parallel device. The object of this particular device was to switch the condenser into either a series or parallel position relative to the one tuning inductance.

An editorial test report and review of this product was given in the October 24th, 1925, issue of our contemporary. We would like readers to note that this product is due to an advertiser in our contemporary.

Readers will, of course, appreciate the fact that switching of the nature incorporated in this special condenser product was very popular round about the period of 1925/6, although soon after it drifted into obsolescence. And it seems hardly necessary to point out that even if the "Extenser" system had not got a well defined history going back some eight or nine years before the publication of the above-mentioned test report, it would be distinctly incorrect to style the "Extenser" condenser a "variant" of the series-parallel condenser advertised in our contemporary's supplementary book for September 26th, 1925. The "Extenser" is a different device altogether and it does a different job.

As all "P.W." readers will know, the "Extenser" provides a combination of compensated tuning and inductance changing.

The manifold advantages of the "Extenser" have been dealt with elsewhere—in "The Wireless Constructor" and in past issues of POPULAR WIRELESS—but it would appear that the advantages are such that our contemporary finds them so important that it must refer back to a device which appeared in one of its advertising pages some years ago, and which, although bearing a certain structural resemblance, is, in fact, entirely different from the "Extenser."

As we have stated before, the embryo of Mr. Dowding's invention—which can be traced back as far as 1916—was first dealt with (from the publication point of view) in the pages of POPULAR WIRELESS for 1926 and, to bring the matter up-to-date, this system was developed and perfected in the form of the "Extenser" system, which was described in detail in our associated journal, "The Wireless Constructor," on sale March 14th, 1931. The facts further show that exactly three weeks later our contemporary, "Amateur Wireless," published an article describing "An entirely novel method" which, in essence, is the same as the "Extenser." The facts in this particular case are so obvious that we do not think it necessary to comment any further.

TECHNICAL NOTES

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

Adding S.G. H.F. Stage.

TALKING about the results obtained with screen-grid valves, I had a case reported to me by a reader the other day in which he found that on adding a screen-grid H.F. stage to his (three-valve) set he got a reduction in sensitivity and volume instead of an increase, as he had expected.

Without knowing all the details of the case it is not very easy to say what is the cause of this result, but there are several points which should be looked into; and I should imagine that there may be a fault in the coupling between the S.G. and the detector if it is such that the new valve precedes.

Extra H.T. Load.

An important point to bear in mind when adding the screen-grid stage is that the high-tension battery may thereby become overtaxed. The current consumed by the screen-grid stage (including that which passes through the screening grid) may be roughly, say 3 milliamps; and in the case of an ordinary average-size H.T. dry battery the addition of this 3 milliamps load to the load already thrown upon the battery by the three-valve set may be sufficient to pull down the voltage very seriously.

If this is the trouble, the remedy is obvious; a larger capacity battery should be used.

Grid-Leak Improvements.

I am often asked whether the old question about the relative merits of grid-leak and anode-bend rectification is to be considered as officially settled, or whether improvements in grid-leak rectification have not had the effect of entirely reopening the controversy.

As I have said before, each of these methods has its particular adherents; and at one time the anode-bend method was regarded by the "experts" as definitely superior, so far as quality of reproduction was concerned, to the leaky grid method.

Great improvements, however, may be made in the leaky grid arrangement by the use of a really correct value of condenser capacity and of grid-leak resistance, care being taken not to make either of these quantities too high, and at the same time by applying a sufficiently high anode voltage.

It is well known that the grid-leak method is much more sensitive on weak signals, and the objection to it has been based upon the fact that, if carelessly or incorrectly employed, it is liable to produce distortion; but with proper adjustments there is no doubt that the grid-leak method of rectification can give results quite as free from distortion as the anode-bend system, though it cannot handle as much in the way of input without overloading.

New Super-Power Valve.

One of the earliest valves in the now-famous P.M. range, and first of the Mullard P.M. "super-power" valves, the P.M.254 has always been a favourite among users of 4-volt valves.

(*Continued on next page.*)

TECHNICAL NOTES

(Continued from previous page.)

From time to time since its introduction improvements have been made in the characteristics of the P.M.254, and Messrs. Mullard now inform me that still further improvements have been introduced. The published characteristics of this valve are now: Maximum filament voltage, 4·0 volts; filament current, 0·2 amp.; maximum anode voltage, 200; anode impedance, 2,150 ohms; amplification factor, 6·5; mutual conductance, 3·0 m.a./volt (the last three being at anode volts 100, grid volts zero).

The increase in amplification factor from 4·2 to 6·5, with practically the same impedance as before, results in an increase in mutual conductance from 2·1 to 3·0. This, combined with the fact that the valve is now suitable for operation with an anode voltage of 200, indicates considerably increased output and renders the P.M.254 an outstanding example of the "super-power" class.

Inductive Condensers.

When talking about screen-grid valves I forgot to mention a point which has cropped up several times in reply to readers' queries, and that is the question of the inductive character of the condensers used in connection with these valves.

The coming of the screen-grid valve has rendered more than ever necessary the provision of condensers having the minimum of impedance in order that small high-frequency currents may readily be passed.

I have been making some tests with the T.C.C. non-inductive condensers introduced a few months back, and have found these very efficient from this point of view. By the special construction of these non-inductive condensers the minimum impedance has been brought down, as compared with the minimum impedance of an ordinary type condenser, to a very much lower wave-length; in some cases the minimum impedance point with the non-inductive condenser occurs at a wave-length no more than about half the wave-length position of the minimum impedance point with an ordinary type condenser. When I speak of minimum impedance, perhaps this will be clearer to some of you if I refer to it as the "resonant point."

All-Electric Radiograms.

It does not seem so very long ago that I was trying to obtain a really satisfactory all-electric radio gramophone for a friend, and I had considerable difficulty in getting hold of anything which met his requirements.

It is very gratifying to note, however, how manufacturers are coming forward with improvements in radio gramophones, and there are now several all-electric machines available which can honestly be described as first-class.

(Continued on next page.)

TECHNICAL NOTES

(*Continued from previous page.*)

In connection with some rather elaborate and prolonged tests which I have had to make recently, I have been using one of the new Gambrell radio gramophones, kindly lent to me by the Gambrell people for the purpose, and I must say that the more I use this instrument the more pleased I am with it.

The circuit is a four-valve one embodying screen-grid H.F., detector, L.F. power and super-power valves (in the D.C. model two pentodes in parallel), and includes a variable selectivity circuit which enables selectivity to be varied from hair-line to broad.

High and low wave-lengths are obtained by a switch, and a pilot lamp illuminates the control panel. A very fine electro-dynamic loud speaker is incorporated in the instrument, and there is a most effective volume control, by means of which the volume either on radio or gramophone can be controlled smoothly from maximum to (practically) zero.

The pick-up is a B.T.H. and the electric gramophone motor is one of the latest type Garrard with automatic stop.

A Good Motor.

In passing, I should like to pay compliment to the well-known Garrard electric gramophone motor, which is certainly in the front rank. The motion is absolutely silent and in uniformity of rotation this unit seems to be equivalent to the best type of multi-spring motor.

One of the particular features of the Gambrell instrument is the inclusion of the Novotone, which as you no doubt know is a device which compensates for losses in the higher frequencies. A control for the Novotone effect is fitted and by means of this it is possible to effect a most pleasing control of the quality of the record reproduction.

TECHNICAL TWISTERS

No. 59. CONTROL KNOBS.

Usually a control knob is fixed to its spindle by a small . . . .-screw.

* * *

Difficulty is often experienced because the countersunk screw is not easily tightened. It is important that it should be quite firm, or the control knob will work . . . . .

* * *

A small "flat" filed on the . . . . . will often assist the grub-screw to hold tightly.

* * *

Old-fashioned dial readings bore no relation to the tuning, but in the Extenser system the dial-reading indicates whether you are tuning on . . . . or . . . . . waves, and every station has a different dial-reading.

CAN YOU FILL IN THE MISSING LETTERS?

Last week's missing words (in order) were: High, Tension, Battery. Negative, Plate (or Anode) Condenser.

DO LISTENER'S GET THEIR MONEY'S WORTH?

Sir Harry Lauder "hands out a few brickbats and bouquets about this broadcasting business."

"WE listeners have to sit still and be lectured and have our programmes arranged without any choice of ours all through the year; and I don't see why we shouldn't get in a word in our own defence just now and again. So Good-Morning, everybody, and here goes—brickbats first in case they prove so heavy that they save me the cost of bouquets.

"I think we might say to begin with that there's a wee bit too much of the serious stuff on the National programme. I'm a serious man masel' (when I get Schedule D, anyway), but I don't want to be improved out of all knowledge.

"Supposing I turned up on the stage one night and started giving ye a lecture about the population problems o' China, for instance! Hoots, mon, we ought to prevent that at all costs.

"Then (here's a heavy one!) what about a bit more variety in the variety concerts? . . ."

And so on. Sir Harry lets himself go in "Modern Wireless" this month. You will enjoy reading his exclusive article.

MODERN PORTABLES.

"SITTING in the drawing-room or in the kitchen you can arrange yourself and your portable so that the controls can be adjusted for another station merely by lazily lifting your hand, and that without the necessity of leaving your chair or even of sitting up.

"And if and when a room or rooms are subjected to temporary or permanent re-arrangement, your portable can be shifted in a few seconds and without interrupting the programme to which it is tuned.

"And I think all that, together with . . ."

Read this splendid impartial review in "Modern Wireless" of the pros and cons of portable radio receiving sets, that will help interested readers in the choice and use of these fascinating instruments.

BEHIND THE SCENES.

. . . "Take them away!" she howled. "Take them away!" A B.B.C. official delicately pointed out the impracticability of this suggestion. "Ah!" screamed the lady. "You say the microphone is dead, but how am I to know? You're broadcasting me. You people will do anything. Take them away, I say, take them away!"

It was some time before anyone could convince her that the microphones were not being used to give her marvellous voice to the world. And the next day, to add ironical point to the situation, the lady in question turned up at Savoy Hill for a studio audition!

That is one extreme, but sometimes people are too helpful. There was the producer who was most willing to assist the engineers, yet when it came to the push he was too pushing.

On the great night he thought that he would give the microphone every chance, and so, unbeknown to the engineers, he ordered his entire chorus to sing as close to the instrument as they could. Result: a very loud noise!

And ceaseless vigilance is required to see that the microphones overhear nothing they should not. They rarely do. You may have heard the stage hand who remarked to the British Isles: "Black out, Bill." . . .

A glimpse of the work and experiences of the "O.B." engineers. Mr. Harold A. Albert tells of the trials and tribulations that beset the men responsible for a theatre broadcast.

WHAT SET IS THIS?

. . . as you will see from the photographs, the whole outfit is housed in quite a moderately-sized cabinet, with the panel and controls at the top and the loud speaker underneath. No external connections of any sort other than those for the mains supply, aerial and earth and pick-up leads (if desired) are required. The use of A.C. valves enables surprising magnification to be got out of the set, and though only three valves are employed (not counting the rectifier, of course) loud-speaker reception is possible with a decent aerial and earth from something like a score or more stations.

Automatic bias, of course, is employed, and a pick-up jack enables electrical gramophone reproduction to be carried out if desired. . . .

That is an excerpt from the "M. V. W." (Mains Valve Working) Three, a super self-contained set described in the May "Modern Wireless."

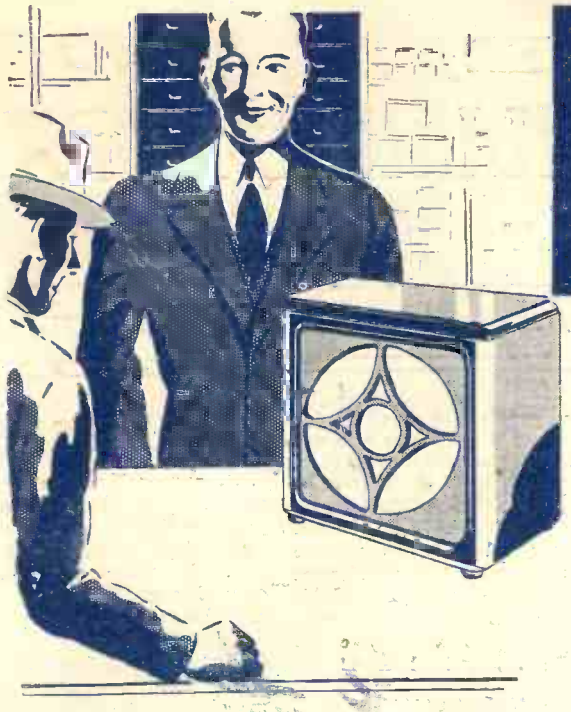
NEW WAVE-LENGTHS FOR BROADCASTING?

THE present ether chaos shows no sign of abatement, and the question of using different bands of frequencies for broadcasting has been receiving much attention. Read what R. L. Smith-Rose, D.Sc., Ph. D., A.M.I.E.E., has to say in "Modern Wireless" about the congested state of the ether and the possibilities of using different wave-length channels to overcome the "traffic problem."

WELL WORTH IT!

WHEN *you have read the few extracts given above, from the May number of "Modern Wireless," which is now on sale, price* 1s., *you will agree that there really is "Something in it." When you have bought and perused a copy at your leisure, you will revise that remark somewhat and say that it's got "everything in it!"*

And It Has!



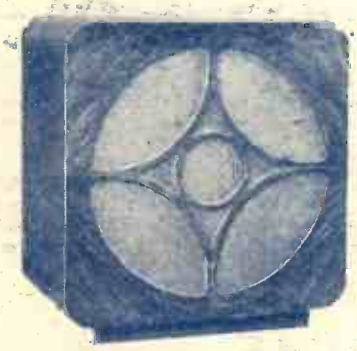
BLUE SPOT makes all the difference

YOU may spend much time and much money in perfecting your set, but if your loud speaker falls short of "perfection" you will not reap the full reward of your care.

A Blue Spot Speaker is supreme and unchallenged. Demonstration at your dealers will prove, beyond shadow of doubt, how beautifully it reproduces both speech and music, not as a flat, colourless copy but as a living reproduction of the original.

Blue Spot performance cannot fail to delight you, so whether you build your own loud speaker or buy one ready made, make sure that it is a Blue Spot.

MODEL 29R



MODEL 41K

BLUE SPOT SPEAKERS

29R 17¾ ins. high, 18 ins. wide, 10½ ins. deep.
Price **126/-**

51R 15¼ ins. high, 14½ ins. wide, 9¼ ins. deep.
Price **84/-**

71R 14 ins. high, 18½ wide, 7 ins. deep.
Price **95/-**

41K 13¼ ins. high, 12½ ins. wide, 6 ins. deep.
Price **50/-**

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Blue Spot

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